RESEARCH

STAFF-BASED INDIVIDUALIZED CARE INVENTORY: PSYCHOMETRIC PROPERTIES OF THE TURKISH VERSION

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Abstract

Introduction: The Individualized Care Inventory–short form is a 22-item self-report measure with four sub-dimensions: knowing the resident, residents' autonomy and choice, staff-to-resident communication, and staff-to-staff communication. The inventory is used for in the context of dementia care. The present study aimed to assess the inventory's psychometric properties with a sample of formal caregivers from nursing homes.

Materials and Methods: The study was conducted with 184 formal caregivers from 13 different nursing homes in Istanbul between July and September 2020. This study used translation and back translation for the scale's language equivalence and expert opinion for the content validity. The reliability and validity were tested by exploratory and confirmatory factor analysis, test-retest correlation analyses and internal consistency.

Results: The content validity index for the inventory was 0.93. In the construct validity analysis, four sub-dimensions corresponding to the original factor structure were derived for the inventory. Cronbach's alpha values for the factors, namely knowing the resident (α = 0.618), autonomy and choice of the resident (α = 0.768), and communication (α = 0.713) were satisfactory. The tests-retests was conducted in a 15–25-day intervals, and all sub-dimensions were positively correlated (r: 0.236–0.390) ($p < 0.05$).

Conclusion: The Turkish Individualized Care Inventory is a valid and reliable tool that can be used to measure the individualized care approaches of formal caregivers in nursing homes.

Keywords: Dementia; Patient-Centered Care; Long-Term Care; Psychometrics.

INTRODUCTION

Individualized care, in contrast to routine or task-oriented care, focuses on meeting the needs of a particular patient at a particular point in time (1) and encompasses the values and principles of holistic care, including respect for individuality, attention to nursing needs, promotion of independence, partnership and negotiation of care, and equity and fairness (2). The critical, common themes characterizing individual-centered care are patient participation and inclusion, communication between the patient and healthcare worker, and the conditions of the place where healthcare is provided (3).

Caring for people with dementia living with multiple chronic conditions and/or functional limitations involves enhancing safety, quality of care, and quality of life through individualized care (IC). Individualized care is a standard practice that takes into account the individuality of the patients and encourages their participation in daily activities and decision making (4). IC promotes the wellbeing, health outcomes, individual functioning, autonomy, and satisfaction of the patient by tailoring the care activities, preferences, and choices to each individual's unique characteristics (5).

To promote person-centered care (PCC) practices and research in geriatric care, it is necessary to ensure that evaluations are carried out using specific measurement tools with appropriate psychometric properties. Since the difficulties and complexities in providing IC for older people, especially people with dementia, are evident (6), Individualized Care Inventory (ICI) which is easy to use, have been developed to measure and understand the individualized care approaches in long-term care environments. Other observational tools, such as Dementia Care Mapping (7) and Resident-centered Assessment of Interactions with Staff and Engagement (RAISE) (8), require large amounts of time to implement and are thus difficult to use with large sample sizes. Furthermore, the Individualized Care Scale (ICS) was developed by Suhonen and colleagues (2007) for older people's care settings but not specifically for dementia care (9). ICS's intended use was in acute care, within a framework of nursing science, and thus would be more appropriate in such settings. Notably, a comparative study of ICI and ICS instruments revealed that a combination of these two tools would be more comprehensive and informative in assessing individualized nursing care for older people (10). While the ICS has already been adapted to the Turkish population by Acaroglu and colleagues (11), a psychometric evaluation and a cultural adaptation of the ICI are required to ensure that both instruments can be used in combination in Turkish older adult care settings.

The ICI was designed to measure the approaches of staff caring for people with dementia based on the following domains: knowing the residents, upholding patient autonomy and choice, and maintaining staff-to-resident and staff-to-staff communication (4). The inventory enables self-evaluations of formal caregivers' individualized care approaches with the aim of enhancing person-centered care (12). Notably, the psychometric properties of the English-Canadian (4) and Chinese (12) versions of the ICI have been examined. Furthermore, O'Rourke and colleagues analyzed the inventory to determine and compare the structures of registered nurses and licensed practical nurses' responses; the formal caregivers involved in the study interpreted and responded to ICI items in a similar manner, indicating the research and practical suitability of this inventory for both groups (13).

Thus, research indicates that interventions aiming to improve person-centered care in long-term care facilities could use the ICI to assess the approaches of formal caregivers working in dementia care. However, it is essential that researchers and managers in the field are equipped with accurate measures to evaluate the effectiveness of individualized care approaches and interventions. To this end, the purpose of the present study was to evaluate the validity and reliability of the short 22-item ICI

for dementia care with a sample of Turkish-speaking formal caregivers providing dementia care in nursing homes.

MATERIALS AND METHODS

Design

A cross-sectional design was adopted to test whether the psychometric properties of the staff-based ICI are suitable for the inventory's use with Turkish-speaking formal caregivers and nurses in long-term care facilities. The STROBE checklist was used for this article (14).

Participants and Data Collection

This methodological and cross-sectional study was conducted to assess the reliability and validity of the Turkish staff-based individualized care inventory (ICI). Physical copies of the self-administered survey forms were sent to 13 nursing homes (12 privately owned and one municipality-owned) in Istanbul by post between July and September 2020. The nursing homes' bed capacities varied from 20 to 120, and the bed allocations were not exclusively for people with dementia but also included other residents without dementia. Nurses, elderly care technicians, and certified caregivers of people with dementia were asked to participate in the study. For validation studies, the larger the sample size, the better; however, the subject-to-item ratio is also suitable for determining sample size if it is intuitively more useful for the researchers and allows for utilizing samples of appropriate sizes (15). Accordingly, the optimal sample size of this study was calculated based on the number of items in ICI, that is, 22. The researchers aimed to reach a sufficiently large sample size with a subject-to-item ratio between 5:1 and 10:1. Subsequently, a total of 184 participants from the 13 facilities were included in the study, resulting in a subject-to-item ratio of 8.4:1, which fell within the targeted range. Retests were conducted with 101 participants from the same facilities in 15–25-day intervals.

Staff-Based Individualized Care Inventory

The ICI was developed by Chappell and colleagues (2007) to evaluate healthcare staff's perceptions of individualized care provided to people with dementia (4). The inventory has four dimensions: (i) knowing the person or resident (IC-know), (ii) providing opportunities for autonomy and choice (IC-autonomy), (iii) ensuring staff-to-staff communication (IC-communication-SS) and staff-to-resident communication (IC-communication-SR). The long (47 items) and short (22 items) versions of the ICI were developed by Chappell et al. after a factor analysis. The responses for IC-know, IC-communication-SS, and IC-communication-SR were collected using a four-point Likert-type scale (1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree) and a five-point Likert-type scale for IC-autonomy (1 = very frequently, 2 = frequently, 3 = occasionally, 4 = seldom, 5 = never). The same scoring type was used for both short and long versions.

The current study used the short version of the ICI. The following four sub-dimensions and their Cronbach's alpha values were considered: IC-know (0.75), IC-autonomy (0.84), IC-communication-SR (0.67) and IC-communication-SS (0.77) (4).

IC-know refers to the staff's own perceptions of how well they know the individuals they are caring for, and the six-item IC-know scale results in scores between 6 and 24. The eight-item IC-autonomy scale measures the general environment in which the staff work, and the possible scores fall between 8 and 40. The three-item IC-communication-SR scale focuses on how the staff communicates with the residents, with possible scores between 3 and 12. Finally, the five-item IC-communication-SS scale reflects the way the staff communicate with one another and with their supervisors, with possible scores lying between 5 and 20. Higher scores indicate better results in each domain. Notably, the domains in the original version of the ICI were found to be highly correlated with one another, with Pearson's r ranging from 0.85 to 0.94 (4).

Translation Procedure

The original questionnaire was independently translated from English to Turkish by three individual researchers and one professional translation office and then back-translated into English by another translation office. The back-translated version was then compared with the English version of the ICI to ensure that the items had no differences in meaning and to confirm the items' conceptual meaning, clarity, and terminology.

Data Analysis

For the statistical data analysis, IBM SPSS Statistics (version 26) and IBM SPSS AMOS (Analysis of Moment Structures) (version 26) were used. Missing data accounted for less than 1% of all the data, and case mean substitution was used to replace the missing values—a technique generally recommended for the same (16).

Next, content validity was evaluated. The translated final version of the ICI was submitted to a panel of six specialists who were informed about the scale and the concepts involved. These experts in geriatric nursing or dementia care were asked to evaluate the 22 items of the inventory, compare the items with those of the original instrument, and evaluate each item on a four-point scale (4 = very relevant, 3 = relevant with some adjustment to phrasing, 2 = only relevant if phrasing is profoundly adjusted, and 1 = not relevant). The content validity index (CVI) was calculated based on the number of experts who provided a rating of 3 or 4 for each item, and the total scores were divided by the total number of experts. A CVI score of 0.80 or above was considered acceptable (16).

Descriptive statistics (mean, frequency, and percentage) were used to describe the participants' sociodemographic and job-related characteristics. To determine the construct validity of the scale, an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA) were carried out. In the reliability tests conducted, internal consistency was assessed using item–total correlations and Cronbach's alpha. Test-retest results were compared using Spearman's correlation.

Ethical Considerations

Written permission to use the ICI was obtained from the authors who developed the instrument. Permission to undertake the study was obtained from Koç University Clinical Research Ethical Review Board (NO: 2020.011.IRB1.002). Participants were informed of the purpose of the study and invited to participate. Participants were assured of their right to refuse to participate or to withdraw from the study at any stage.

RESULTS

Sample Characteristics

A total of 256 staff and care providers from 13 eligible facilities were asked to participate in the study, of which 184 agreed. The majority of participants were female (71%), with a mean age of 31 years; 49.5% were certified caregivers, 31.5% were nurses, and 18.5% were elderly care technicians. Most of the participants had attained a high school level of education (40.2%) and had an average of 6 years of job experience in elderly care and 4.2 years of job experience in dementia care. 72.8% of the staff had not undergone specific education for dementia issues or dementia care **(Table 1).**

Construct Validity

Construct validity for the Turkish version of the ICI was analyzed using EFA and CFA. Before conducting these analyses, the Kaiser–Meyer–Olkin (KMO) test and Bartlett's test were conducted. Specifically, the adequacy of the sample size was determined using the KMO value; the result was 0.706, indicating that the sample size was suitable for EFA. The results of the Bartlett's Test of Sphericity were statistically significant ($\chi^2 = 1200.455$, $p = 0.00$, $p < 0.01$). This result indicates the assumption of equal variances for the sample is true before running certain statistical tests.

Table 1. Sample Characteristics

Characteristics		n	%
Age	18-25 age	76	41.8
	26-36 age	47	25.8
	37-56 age	59	32.4
Gender	Female	130	71
	Male	53	29
Education	Primary school	37	20.1
	High school	74	40.2
	Vocational school	56	30.4
	University degree	13	7.1
	Graduate degree	2	1.1
Job title	Nurse	58	31.5
	Elderly care technician	34	18.5
	Certified Caregiver	91	49.5
Elderly care experience	0-2 Years	24	14.4
	2-4 Years	55	32.9
	4-8 Years	37	22.2
	8-12 Years	30	17.9
	12-18 Years	15	9.0
	>18 Years	6	3.6
Dementia specific education	Yes	46	27.2
	No	123	72.8

The EFA analysis revealed a four-factor structure for the scale. A principal component analysis was used as the extraction method, and the item loadings were between 0.40 and 0.82 after rotation (varimax). The four-factor structure was found to explain 47.153% of the total variance.

The model fit of the item–factor relationship derived by EFA was assured by CFA. CFA fit indices were used to reveal the adequacy of the model in this study, namely the chi-square fit, goodness-of-fit index (GFI), root mean square error of approximation (RMSEA), comparison of model fit indices (CFI), and normed fit index (NFI). The scale's fit indices were significant after modification ($\chi 2 = 294.97$; df = 155, $p = 0.00$; $p < 0.01$). The fit index values were as follows: GFI = 0.865; RMSEA = 0.070; CFI = 0.849; NFI = 0.736 **(Table 2).** Two items in the ICI were found to be meaningless based on their regression weights and $p < 0.05$ statistical significance level and were thus deleted. One of the deleted items was from the IC-know subscale, and the other was from the IC-autonomy subscale. Accordingly, the Turkish version of the ICI was reduced to 20 items. Modification processes were carried out by creating covariance matrices between the appropriate items. The fit indices of the model provided an acceptable level of validity after these modifications.

Reliability Analysis

The reliability of the inventory was evaluated using an item–total correlation test, Cronbach's alpha coefficient test, and test-retest correlation. The Cronbach's alpha values of the IC-know, IC-autonomy, and IC-communication subscales were 0.618, 0.768, and 0.718, respectively. Item–total correlation coefficients were corrected and calculated for the items of each dimension of the ICI. Average item-total correlations ranged between 0.194 and 0.543 for

Table 2. Fit Indices Obtained from CFA for the ICI

Fit Indices	Before Modification	After Modification
χ^2 / df	531.84 / 203 = 2.62	294.97 / 155 = 1.903
RMSEA	0.094	0.070
SRMR	0.093	0.081
CFI	0.679	0.849
GFI	0.792	0.865
NFI	0.577	0.736
AGFI	0.741	0.817

Abbreviations: CFA, confirmatory factor analysis; CFI, comparative fit index; df, degree of freedom; GFI, goodness of fit index; NFI, normed fit index; AGFI, adjusted goodness of fit index; SRMR, standardized root mean square residual; RMSEA, root mean square error of approximation; χ2, chi-square.

IC-know, 0.290 and 0.633 for IC-autonomy, 0.261 and 0.575 for IC-communication as a whole, 0.308 and 0.403 for IC-communication-SR, and 0.350 and 0.637 for IC-communication-SS **(Table 3).**

A total of 101 participants agreed to take the retest. The test-retest measurements were taken in intervals of 15–25 days. The correlation result was positive for the sub-dimensions ($r = 0.236$, 0.390) and statistically significant but with low correlation ($p < 0.001$, $p < 0.05$) **(Table 4).**

Table 3. Internal Consistency and Item-Total-Item Correlations of ICI

ICI and Sub-Domains	Cronbach Alpha	Item-Total Item Correlations	Mean Score ± SD
ICI total	0.779	0.142-0.742	67.46±8.09
IC-Know (5 items)	0.618	0.194-0.543	16.59±2.94
IC-Autonomy (7 items)	0.768	0.290-0.633	27.07±5.21
IC-Communication (8 items)	0.713	0.261-0.575	24.34±3.79
IC-SR Communication (3 items)	0.555	0.308-0.403	7.37±1.89
IC-SS Communication (5 items)	0.748	0.350-0.637	16.97±2.81

Table 4. Test-Retest Reliability Analysis of ICI

ICI Sub-Scales	Test Mean ± SD	Re-test Mean ± SD	r*	p
IC-Know	3.31 ± 0.58	2.96 ± 0.62	0.349	0.000
IC-Autonomy	3.59 ± 0.58	3.95 ± 0.65	0.390	0.000
IC-SR	2.4 ± 0.60	2.47 ± 0.64	0.236	0.018
IC-SS	3.39 ± 0.563	3.44 ± 0.44	0.346	0.000

*Spearman correlation test, n=101

DISCUSSION

To the best of our knowledge, this is the first study to evaluate the validity and reliability of the Turkish version of the ICI for dementia care in nursing home settings and to indicate the psychometric properties to use in dementia care practice and research. The reliability and validity tests revealed that the Turkish ICI's psychometric properties are similar to those of the original inventory.

Content validity was assessed by calculating the content validity index (CVI), which indicates good content validity if the value is above 80% (17). The content validity of the ICI was found to be 93.7%, which was excellent. Sample size recommendations for a reliability analysis vary from 200 to 1000 in the literature, and validity studies and factor analyses require 10 subjects per item to generate replicable results (18). Although the target was 5–10 subjects per item, only 184 people agreed to participate in this study due to restrictions and workload pressure during the COVID-19 pandemic period, resulting in an 8.4:1 subject-to-item ratio.

One of the most commonly used methods for assessing the reliability of a measurement tool is to evaluate the internal consistency of the scale. Accordingly, the reliability of the Turkish ICI and its sub-dimensions were evaluated, revealing moderate to good internal consistency. The internal consistency of the IC-communication-SR subscale was low. A low internal consistency means that there are items or sets of items which are not correlating well with each other. The low internal consistency for IC-communication-SR was also determined in adaptation of ICI to Chinese language (12). Notably, in the reliability and validity study of the Chinese version of the ICI, Cronbach's alpha values were as follows: 0.67 for "knowing residents," 0.72 for "resident autonomy," 0.63 for "resident-to-staff communication," and 0.80 for "staff-to-staff communication" (12). When the items of both subscales (resident-to-staff and staff-to-staff communication) were combined under the communication dimension in the Chinese version, Cronbach's alpha value (α= 0.79) was more acceptable (12) and close to the Turkish version's value of 0.779. Therefore, in the Turkish version of ICI resident-to-staff and staff-to-staff communication sub-dimension should be combined under communication sub-dimension for better Cronbach's alpha value.

The exploratory factor analysis in the present study revealed a four-factor structure similar to that of the English-Canadian and Chinese versions (4, 12). Furthermore, a confirmatory factor analysis was used to reveal the adequacy of the model fit of the Turkish version. Two items—one for IC-know and one for IC-autonomy—were deleted due to their low regression weights in the CFA. The resulting 20-item inventory was found to adequately fit the model after a few modifications of the items.

The item–total score correlations were generally acceptable. The time invariance of the ICI was evaluated using the test-retest correlation. The results of two measurements under the same circumstances but with an interval of 15–25 days were evaluated. The test-retest correlation result was positive for all domains (r = 0.236, 0.390), and a low but statistically significant correlation was found.

There are some limitations to the study that need to be addressed. First, test-retest reliability was analyzed following a 15–25-day interval, which was longer than the typical period and may have affected the results. The study was conducted during the COVID-19 pandemic, and the restrictions in place may have had a negative effect on the care approaches and responses of the caregivers. Thus, additional studies with larger samples are needed to further analyze the ICI and underlying attributes of individual care.

The present study evidences the usefulness of ICI for dementia care and can guide the development of individualized dementia care in Turkish nursing homes, in turn improving the quality and

effectiveness of nursing care in long-term care environments. The short 20-item ICI instrument is precise and focuses on the individualized care approaches required for caregivers to provide quality care. Furthermore, this assessment tool would be easy to use in busy, long-term care environments, and it may also be applicable to healthcare professionals in other settings.

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