



Psychometric evaluation of the Malay version of the Individual Community-Related Empowerment scale among older adults in Malaysia

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Abstract

Background: Malaysia is projected to become an aged country by 2030, with the older age group comprising 10 percent of the total population. To address this demographic shift, comprehensive plans and initiatives are being implemented at various levels, ranging from the government to local communities. A crucial aspect of these efforts is community empowerment, which requires a reliable and validated tool for measurement.

Objective: This study aimed to validate the Individual Community Related Empowerment (ICRE) scale in alignment with the national language of Malaysia.

Methods: This cross-sectional study was conducted from May to December 2019. Back-to-back translation from the English to Malay version of the ICRE scale was done. A total of 328 older persons aged 60 years old and above who attended clinics and understood Malay had been randomly selected. Exploratory factor analysis (EFA), particularly Principal Component Analysis (PCA) with Varimax rotation and Kaiser Normalization, was performed in this study using IBM SPSS version 27 Amos graphic.

Results: The findings revealed that the Malay version of the Individual Community Related Empowerment (ICRE-m) scale consists of five components: self-efficacy, intention, participation, motivation, and critical awareness, which collectively accounted for 92.3% of total variance. All five components demonstrated Cronbach's alpha values greater than 0.7, indicating the reliability of the selected items for field studies.

Conclusion: The ICRE-m scale is acceptable for field studies and valid for measuring individual-related community empowerment. Nurses and other healthcare professionals can employ this scale specifically within the Malay-speaking population, particularly in the Asian region. Future studies on community empowerment among older individuals can utilize this tool to assess community readiness for participating in community health interventions.

Keywords


factor analysis; empowerment; ICRE; aged; Malaysia; nurses

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Article info:

Received: 1 April 2023
 Revised: 30 April 2023
 Accepted: 10 June 2023

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E-ISSN: 2477-4073 | P-ISSN: 2528-181X

Background

Promoting community empowerment is a crucial element in public health strategies aimed at enhancing the participation of older adults and improving their overall well-being. This approach aligns with the National Health Policy for Older Persons (Ministry of Health Malaysia, 2011) and is a key aspect of neighborhood-based assistance programs designed to support aging in place. A recent systematic review by Tsubouchi et al. (2021) emphasized the significance of incorporating diverse attributes when measuring empowerment among older adults. According to the World Health Organization, community empowerment involves empowering communities by granting them greater authority and decision-making power. The United Nations projects that by 2050, approximately one in six people worldwide will be aged 65 or above (United Nations Department of Economic and Social Affairs, 2020). In 2019, the global population of older adults (aged 65 and above) was 703 million, and this

number is expected to double to 1.5 billion by 2050. From 1990 to 2019, there was a 3% increase in the number of older adults; from 2019 to 2050, this is projected to rise by 7% (United Nations Department of Economic and Social Affairs, 2020). The proportion of older adults in the population is increasing across all countries. By 2050, there will be 1,549 million older adults worldwide, with the Asian continent ($n = 525.3$ million aged 65 or above) having one of the highest proportions of older adults globally in the coming decades.

Empowerment is defined as interpersonal behavioral change across various levels, including the organizational, community, and individual. It involves equipping individuals or groups with the necessary tools, support, and resources to effect desired changes and enhance their capacity to contribute to group goals within a specified timeframe (Haddad et al., 2023). While there has been limited exploration of individual-level empowerment in research and measurement tools to assess it, the Individual Community Related Empowerment (ICRE) scale was developed by Kasmel and

Tanggaard (2011). This scale comprises five dimensions: self-efficacy, intention, participation, motivation, and critical awareness. These dimensions capture how individuals perceive and engage in community participation. The questionnaire was initially validated in English using a sample population of adolescents and adults in Estonia (Kasmel & Tanggaard, 2011).

Community empowerment encompasses more than just community involvement, participation, or engagement; it also entails taking ownership and initiating action to achieve social change. It is believed that when individuals acquire authority, they can share that power with others (Cornwall, 2016). The Ottawa Charter highlights the significance of an empowerment-based approach to enhance individual capabilities (World Health Organization, 1986). Community health nurses play a vital role in community empowerment through coordinated health promotion activities that utilize a multidisciplinary approach. They also provide targeted health education at primary healthcare facilities (World Health Organization, 2010). In nursing, community health nurses facilitate community empowerment as part of care and health promotion, employing the nursing decision-making process (Standing, 2014). Assessing the readiness for community empowerment in any healthcare intervention is crucial.

To the best of our knowledge, no published validation of the Malay version of the Individual Community Related Empowerment (ICRE-m) scale has been conducted, specifically among the older adult population. Therefore, this study aimed to validate the ICRE-m among older Malay individuals in Malaysia. The study was designed to assess community readiness for engagement and participation, promoting active and successful aging. The ICRE questionnaire, developed by Kasmel and Tanggaard (2011), offers a simplified and more general approach suitable for assessing community participation. However, considering the need for validation within a specific population, it is crucial to validate the questionnaire for accurate measurement.

Methods

Study Design

A cross-sectional study was undertaken in selected government primary healthcare centers in Malaysia, employing a stratified random sampling approach. The sampling process involved selecting clinics at the district level and then selecting older patients who were registered and had attended the chosen clinics.

Translation, Adaptation, and Validation of the Instrument

The Individual Community Related Empowerment (ICRE) scale consists of 18 items, utilizing a five-point Likert scale (1 = Strongly Agree, 2 = Agree, 3 = Unsure, 4 = Disagree, 5 = Strongly Disagree). The original ICRE construct, developed by Kasmel and Tanggaard (2011), comprises five components: self-efficacy (seven items), intention (four items), participation (three items), motivation (three items), and critical awareness (one item) (Table 1). The English version of the ICRE questionnaire has been validated with a Cronbach's alpha value of 0.86 among the Estonian population by Kasmel and Tanggaard (2011).

Table 1 Definitions for each domain of ICRE

Domains	Operational Definition
Intention	Intention to participate is an anticipated outcome that is intended, or that guides one's planned action
Self-efficacy	Individual's confidence in their personal capability to organize and execute the course of action required to deal with prospective situations and belief in their ability to regulate their motivation, thought processes, emotional stages, and the social environment, as well as behavioral attainment
Participation	Participation is the involvement in any community action that an individual attend without pay to achieve a common goal and/or social change
Motivation	Motivation is the belief that one should participate in community problem-solving processes as a responsibility to others
Critical awareness	Critical awareness is the sense of the importance of community issues and understanding of the purposes of community action

Content validity

The process of expert content validity involved the participation of two public health specialists and one public health nurse. Their role was to select suitable tools and assess the item content's appropriateness in addressing the study objectives for content validity assessment. Through a comparison of different options and considering the evidence presented in the systematic review conducted by Tsubouchi et al. (2021), it was determined that the ICRE scale was the most fitting for the objectives of the present study. Permission to utilize the ICRE scale was obtained from the original authors. It is also noted that no content validity index (CVI) was computed in this phase.

Instrument translation process

The English version of the ICRE was translated into Malay to ensure better comprehension for the research participants, considering that Malay is the primary language spoken in Malaysia. The translation process involved a subject matter specialist to ensure accuracy and to facilitate understanding among the senior citizens within the community. A back-to-back translation approach was employed to verify the similarity of meanings between the translated Malay and the original English version. Another subject expert proficient in both Malay and English compared the translated text with the original to ensure coherence and consistency.

Construct validity

Prior to testing with a larger sample, a preliminary evaluation of the questionnaire's usability in Malay was conducted among six older individuals. This aimed to assess their comprehension and ability to utilize the questionnaire effectively. Subsequently, a total of 328 respondents were selected for a field study to evaluate the validity and reliability of the scale. The participants consisted of older adults aged 60 years and above, encompassing diverse backgrounds. The selection process employed a simple random sampling method, drawing from a list of registered outpatient clinics that

had granted consent for participation in the study. The inclusion criteria for the study samples required that the individuals be older adults aged 60 years or older, listed in the registered outpatient clinics, and willing to participate. On the other hand, the exclusion criteria for the study samples encompassed non-Malaysian citizens, individuals who were sick or hospitalized during the data collection period, those who declined to participate, and those who were unable to comprehend the Malay language. Exploratory factor analysis (EFA), specifically principal component analysis (PCA), was employed to assess the construct validity.

Data Collection

Data were collected from 1 May to 31 December 2019. The researchers personally gathered the data for the study from the participants.

Data Analysis

IBM SPSS Amos version 27 was utilized to conduct the exploratory factor analysis (EFA), especially Principal Component Analysis (PCA) with Varimax rotation and Kaiser Normalization. PCA is a statistical technique used to identify underlying factors or components that explain the variance in a set of variables. Varimax rotation is a common method used to simplify the interpretation of the factors by maximizing the variance of the factor loadings for each variable. Kaiser Normalization is a process that adjusts the eigenvalues in PCA to enhance the interpretability of the results. Additionally, the researchers calculated the Kaiser-Meijer-Olkin (KMO) measure of sampling adequacy, as suggested by [Juhaida Johari et al. \(2012\)](#). A KMO value greater than 0.6 confirms the sufficiency of the data for proceeding with the EFA, as indicated by [Awang \(2012\)](#) and [Hoque et al. \(2016\)](#). The analysis further examined the proportion of total variance explained by each construct, the factor loading of each item, the dimensionality of the items, and the internal consistency of the construct, measured through Cronbach's alpha, as described by [Awang \(2012\)](#) and [Hoque et al. \(2016\)](#). The total variance explained should exceed the minimum requirement of 60% to be considered acceptable. Cronbach's alpha values greater than 0.7 suggest the reliability and suitability of the selected items for the field study. Furthermore, a factor loading exceeding 0.6 is necessary for an item to be considered significant and retained in the analysis, according to [Awang \(2012\)](#).

Ethical Considerations

This study obtained ethical approval from the National Medical Research Registry of Malaysia (NMRR) and the University Kebangsaan Malaysia Research Ethic Committee (UKMREC) (Approval number: FF-2019-219). Prior to data collection, written consent was obtained from all respondents, ensuring that participants willingly and voluntarily agreed to take part in the research. By obtaining their consent, the study respected the rights and privacy of the respondents. This approach aligns with ethical guidelines and safeguards the well-being and autonomy of the study participants throughout the research process.

Results

Characteristics of the Participants

Of the total of 328 participants, the largest proportion (75.6%) fell within the age range of 60 to 69 years, with smaller proportions observed in the age groups of 70 to 79 years (22.6%) and 80 years and above (1.8%). The mean age of the participants was calculated as 66.43 years, with a standard deviation of 5.04 years. With regard to gender distribution, 35.4% of the participants were male, while the majority (64.6%) were female. Ethnically, the study population was predominantly Malay (83.2%), followed by Chinese (9.8%), Indian (5.5%), and individuals from other ethnic backgrounds (1.5%). The occupational distribution indicated that the majority of participants were unemployed or retired (75.9%), while the remaining 24.1% were employed. In terms of educational attainment, a small proportion of participants (4.9%) had received no formal education, the majority (68.9%) had completed primary or secondary schooling, and a significant proportion (26.2%) had attained a college or university education. Regarding individual income, 43.9% of participants reported earning less than 1,000 Ringgit Malaysia, 44.2% made between 1,000- and 3,000-Ringgit Malaysia, and 11.9% reported earnings above 3,000 Ringgit Malaysia. Finally, in terms of the residential area, 39.6% of participants resided in urban areas, while the majority (60.4%) were from rural areas ([Table 2](#)).

Table 2 Respondent's characteristics (N = 328)

Characteristics	n (%)
Age Groups	
60 to 69	248 (75.6)
70 to 79	74 (22.6)
80 and above	6 (1.8)
Age, in years (Mean 66.43, SD 5.04, Min 60, Max 83)	
Gender	
Male	116 (35.4)
Female	212 (64.6)
Ethnic	
Malay	273 (83.2)
Chinese	32 (9.8)
Indian	18 (5.5)
Others	5 (1.5)
Occupation	
Unemployed/retiree	249 (75.9)
Employed	79 (24.1)
Education	
No formal education	16 (4.9)
Primary or secondary school	226 (68.9)
College or University	86 (26.2)
Individual Income (Ringgit Malaysia)	
Less than 1,000	144 (43.9)
1,000 to 3,000	145 (44.2)
Above 3,000	39 (11.9)
Living Area	
Urban	130 (39.6)
Rural	198 (60.4)

Description of Each Item within the Five Domains of the ICRE-m Scale

[Table 3](#) presents the descriptive statistics of each item within the five domains of the ICRE-m scale based on a sample size of 328 participants. For the Intention domain, the mean scores

ranged from 3.02 to 3.79, with standard deviations ranging from 0.62 to 0.82. The lowest mean score was observed for Intention6 (n6) at 3.02, while the highest was for Intention5 (n5) at 3.79. Within the Self-Efficacy domain, the mean scores ranged from 3.33 to 3.63, with standard deviations ranging from 0.72 to 0.78. For the Participation domain, the mean scores ranged from 3.45 to 3.57, with standard deviations ranging from 0.73 to 0.85. Within the Motivation domain, the mean scores ranged from 3.91 to 3.99, with standard deviations ranging from 0.73 to 0.79. Lastly, the mean score for the Critical Awareness domain was 3.68, with a standard deviation of 0.62. Overall, the mean scores for all items across the five domains were above 3.0, suggesting that, on average, the participants expressed a moderate to high agreement with the statements within each domain of the scale.

Table 3 Descriptive statistics of each item of the five domains of ICRE-m (N = 328)

Items	Min	Max	Mean (SD)
Intention			
Intention1(N1)	2	5	3.74 (0.67)
Intention2(N2)	2	5	3.53 (0.74)
Intention3(N3)	2	5	3.63 (0.63)
Intention4(N4)	2	5	3.74 (0.67)
Intention5(N5)	2	5	3.79 (0.62)
Intention6(N6)	1	5	3.02 (0.82)
Intention7(N7)	1	5	3.10 (0.78)
Self-Efficacy			
Selfefficacy1(SE1)	1	5	3.58 (0.78)
Selfefficacy2(SE2)	2	5	3.44 (0.76)
Selfefficacy3(SE3)	1	5	3.33 (0.72)
Selfefficacy4(SE4)	1	5	3.63 (0.72)
Participation			
Participation1(P1)	1	5	3.46 (0.73)
Participation2(P2)	1	5	3.57 (0.77)
Participation3(P3)	1	5	3.45 (0.85)
Motivation			
Motivation1(M1)	1	5	3.96 (0.77)
Motivation2(M2)	1	5	3.91 (0.73)
Motivation3(M3)	1	5	3.99 (0.79)
Critical Awareness(C)	1	5	3.68 (0.62)

Exploratory Factor Analysis (EFA) Results

The EFA procedure was performed using the Principal Component Analysis (PCA) extraction method with varimax rotation on the 18 items measuring the community empowerment construct. The results indicated that Bartlett’s test was significant (Approx. Chi-Square = 3522.817, df = 153, $p < 0.05$), suggesting that the data is suitable for factor analysis. Additionally, the measure of sampling adequacy, as assessed by the Kaiser-Meyer-Olkin (KMO) statistic (0.801), exceeded the minimum requirement of 0.6 for the constructs, presenting suitability for conducting EFA.

Another measure used in this study was the total variance explained, which indicates how well the selected items can estimate the latent construct of community empowerment. **Table 4** presents the total variance explained, which helps assess the adequacy of the measuring items. The measuring items for community empowerment were categorized into five principal components, and the total variance explained by these components amounted to 92.3%, which was highly acceptable.

Table 4 Total variance explained contributed by every component of ICRE-m

Components	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1 (intention)	5.798	32.212	32.212
2 (self-efficacy)	3.876	21.534	53.746
3 (participation)	2.978	16.543	70.289
4 (motivation)	2.966	16.475	86.764
5 (critical awareness)	1.002	5.567	92.331

Cronbach’s alpha was calculated for each component to assess the internal reliability of that specific component in measuring the construct. **Table 5** displays Cronbach’s alpha values for each component of the ICRE-m. It is worth noting that all five components exhibited Cronbach’s alpha values greater than 0.7, indicating strong internal reliability, suggesting that the items within each component are consistent and reliable measures of their respective constructs.

Table 5 Internal reliability value for each component of ICRE-m

Components	Number of Items	Cronbach’s Alpha
Intention	7	0.964
Self-efficacy	4	0.987
Participation	3	0.993
Motivation	3	0.995

Table 6 provides insights into the factor loadings for each item and their respective components within the context of community empowerment. The high factor loading values (>0.6) observed across the items indicate their strong association with the underlying components, highlighting the relevance and contribution of each item in measuring the intended constructs of Intention, participation, motivation, self-efficacy, and critical awareness.

Table 6 Factor loading for each item and their respective components

Items	Rotated Component Matrix				
	Component				
	1	2	3	4	5
Intention1(N1)	0.842				
Intention2(N2)	0.934				
Intention3(N3)	0.957				
Intention4(N4)	0.889				
Intention5(N5)	0.861				
Intention6(N6)	0.900				
Intention7(N7)	0.896				
Participation1(P1)				0.978	
Participation2(P2)				0.981	
Participation3(P3)				0.972	
Motivation1(M1)			0.982		
Motivation2(M2)			0.977		
Motivation3(M3)			0.970		
Selfefficacy1(SE1)		0.969			
Selfefficacy2(SE2)		0.978			
Selfefficacy3(SE3)		0.975			
Selfefficacy4(SE4)		0.941			
Critical awareness(C)					0.981

Discussion

This study aimed to assess the psychometric properties of the ICRE-m scale among older adults in Malaysia. The original version of the ICRE scale was translated and validated into the Malay language—the translation process aimed to ensure similarity between the original English and the translated Malay versions.

Exploratory factor analysis (EFA) was conducted among 328 respondents to identify the smallest number of constructs (factors, dimensions, variables) that could effectively measure community empowerment with minimal loss of information and enhanced interpretability (Baharum et al., 2023; Watkins, 2018). EFA serves as a foundational step before constructing structural equation modeling (Hair et al., 2019).

The results indicated that the ICRE-m demonstrated good validity and reliability. The PCA revealed the emergence of five dimensions or components that explained a significant proportion of the total variance in community empowerment. The factor loadings for each item exceeded the recommended threshold of 0.6, indicating their suitability for retention in the instrument. Moreover, all five components exhibited high internal consistency, with Cronbach's alpha values exceeding the acceptable threshold of 0.7.

These findings validate the use of the ICRE-m as a reliable and valid tool for assessing community empowerment among the older Malaysian population. The instrument's ability to measure motivation, participation, self-efficacy, intention, and critical awareness further supports its relevance for evaluating the effectiveness of government and non-governmental health initiative programs. Future research can employ confirmatory factor analysis and structural equation modeling to further test the validity and applicability of the ICRE-m in real-world field studies.

This study successfully assessed the validity and reliability of the ICRE-m scale by conducting an exploratory factor analysis and analyzing various statistical measures. The ICRE-m demonstrated good internal consistency and validity in measuring community empowerment among the Malaysian older adult population. These findings contribute to the development of a robust measurement tool for evaluating health promotion initiatives and assessing the empowerment of older age community-based groups.

Implications for Nursing Practice

There are some implications of this study for nursing practice:

First, the study validated the Malay version of the Individual Community Related Empowerment (ICRE-m) scale for assessing community empowerment among older adults in Malaysia. Nurses can use this tool in their practice to evaluate empowerment within community-based groups. This can help identify areas of strength and areas where interventions may be needed to promote community empowerment.

Second, the identification of five dimensions or components that contribute to community empowerment (motivation, participation, self-efficacy, intention, and critical awareness) can guide nurses in developing targeted interventions. Nurses can design programs and initiatives that enhance community empowerment among older adults in Malaysia by addressing these specific dimensions. For example, interventions can focus on increasing motivation,

promoting active participation, fostering self-efficacy, and creating awareness of critical issues within the community.

Third, the validated ICRE-m can serve as a reliable tool to evaluate the effectiveness of government and non-governmental health initiatives and programs. Nurses can use this scale to assess the impact of various interventions aimed at promoting health and empowering the older adult population in Malaysia. By measuring the changes in community empowerment dimensions over time, nurses can determine the success of these initiatives and make informed decisions about their continuation or modification.

Fourth, the study suggests future research directions, such as employing confirmatory factor analysis and structural equation modeling, to further validate and apply the ICRE-m in real-world field studies. Nurses can actively engage in research activities to expand the evidence base and contribute to advancing nursing knowledge in community empowerment. By conducting further studies, nurses can explore the applicability of the instrument in different populations and settings, thereby enhancing the understanding of community empowerment and its impact on health outcomes.

Conclusion

This study enhances the understanding and measurement of the ICRE-m construct, specifically within the context of older individuals in the Malaysian population. The ICRE-m was adapted from a previous study conducted by Kasmel and Tanggaard (2011) that focused on measuring health promotion activities in the community of Estonia, an Eastern European country. The scale was translated into Malay for use with the study participants to make it relevant to the Malaysian context. Through PCA, this study identified five dimensions of the ICRE-m construct: intention, participation, motivation, self-efficacy, and critical awareness. These dimensions were measured using a set of 18 items. The reliability measures for each dimension demonstrated high Cronbach's alpha values, indicating internal consistency. Moreover, the factor loadings of the items exceeded the recommended threshold of 0.6, further supporting their suitability for inclusion in the instrument. These rigorous validation procedures ensure that the ICRE-m is internally consistent and reliable for field studies. Overall, this study contributes to the field by providing a robust and validated measurement tool for assessing the ICRE-m construct among older individuals in the Malaysian population. Adapting the instrument from a different cultural context and its subsequent validation demonstrate its applicability in diverse settings. Researchers and practitioners in nursing and other disciplines can confidently utilize the ICRE-m to assess community empowerment and tailor interventions to enhance the well-being of older adults in Malaysia.

Declaration of Conflicting Interest

The authors declared no conflict of interest in this study.

Funding

The authors declared no grant for this research from any funding agency in the public, commercial, or not-for-profit sectors. The Medical Faculty of Universiti Kebangsaan Malaysia support the cost for the publication of this article.

Acknowledgment

All authors would like to acknowledge the support provided by the Elderly Health Clinic Club for participating in the study. We thank the Director General of Health Malaysia for permission to conduct and publish this article.

Authors' Contributions

ZZ did the data collection herself using the validated questionnaire. ZZ, RS, and AZA conceived the scope of the review to meet the study objectives. Literature search, data collection, analysis, and interpretation were conducted by ZZ and verified by RS. ZZ drafted the first iteration of the manuscript. All authors contributed substantially to the critical review, editing, and revision of the manuscript. All authors approved the final version of the manuscript.

Authors' Biographies

Dr. Zuraidah Zaidun, MPH, Dr. Rosnah Sutan, MPH, PhD, and Dr. Azimatun Noor Aizuddin, MPH, PhD are all Public Health Medicine Specialists who work at the primary healthcare and manage health programs through the public health team composed of various disciplinaries in healthcare delivery.

Data Availability

The dataset generated for the analysis of this manuscript is available from the corresponding author upon reasonable request. The ICRE-m can be accessed in the [supplementary file](#).

Declaration of Use of AI in Scientific Writing

Nothing to declare.

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Cite this article as: Zaidun, Z., Sutan, R., & Aizuddin, A. N. (2023). Psychometric evaluation of the Malay version of the Individual Community-Related Empowerment scale among older adults in Malaysia. *Belitung Nursing Journal*, 9(3), 287-292. <https://doi.org/10.33546/bnj.2652>