

Cross Cultural Adaptation and Validation of Nigerian (Igbo) Version of the Older People's Quality of Life Questionnaire (OPQOL-35): a Validation Study

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Abstract

Background

Quality of life (QoL) has been revealed to determine an older adult's assessment of successful and active ageing; and to evaluate various range of health and social care interventions. Most QoL assessment tools were developed for use in developed countries. This may not be suitable for developing nations such as Nigeria. There is need for availability of culture- and environment- specific tools for assessment of QoL. This study was therefore designed to cross-culturally adapt the OPQOL-35 into Igbo language, and determine its reliability and validity.

Methods

The original English OPQOL-35 (E-OPQOL-35) was translated into Igbo language, synthesized, back translated, and subsequently subjected to expert panel review, pre-testing and cognitive debriefing interview, following the American Academy of Orthopaedic Surgeons' guideline. The final Igbo version (I-OPQOL-35) was tested for internal consistency, concurrent and structural validities in a cross-sectional study of 115 consenting apparently healthy older adults (54.8% females) that were recruited from conveniently selected local government areas in Enugu State, at 0.05 level of significance.

Results

The OPQOL-35 was cross-culturally adapted to Igbo with all its 35 items retained. The Spearman correlation coefficients between the participants' domain and total scores on the I-OPQOL-35 and E-OPQOL-35 ($\rho = 0.92-1.00$) were excellent. The Mann Whitney-U test revealed no significant difference between corresponding scores in the E-OPQOL-35 and I-OPQOL-35 ($p = 0.65-0.94$). The internal consistency coefficient of the I-OPQOL-35 was 0.78.

Conclusions

The I-OPQOL-35 is therefore a valid and reliable instrument for the assessment of QoL among Igbo older adults in Nigeria.

Introduction

Ageing is a natural and universal phenomenon associated with deteriorating social, physical, psychological, and physiological changes which affects every individual, family, community, and society [1, 2]. It is usually accompanied by disability, functional decline, and an increased risk of morbidity and mortality which consequently impacts negatively on their quality of life [3]. Hence, despite the increase in the proportion of older adults being a victory for humanity, it does not necessarily guarantee living well

[4]. Consequently, it is not enough to add years to life, but quality of life to years, as it is essential to ensure that the extra years of life are worth living [5].

Quality of life (QoL) is a subjective, complex concept that depends on the socio-cultural level, ethical and religious values, age group, and personal goals and perceptions of the individual; incorporating several theoretical approaches and assessment methods that needs to be socially relevant [6–8]. Quality of life among older adults is an important area of concern which reflects the health status and wellbeing of older adults [1]. It can be affected by several factors such as increased health challenges, poor physical and mental health status, impaired sexual activity, loneliness, poverty, retirement, loss of independence, poor economic, cultural, educational and health care conditions, community support, access to health services, environmental quality, inadequate social interactions, and so on [9, 10]. With advancing age, maintaining a good QoL at an older age is of increasing relevance and priority globally, requiring valid measurement [11]. As QoL is a largely subjective concept, it is important to reflect lay views in any instrument designed to measure it [12]. Hence, quality of life should be assessed based on individual older adults' perception of what gives meaning to their lives within their value and cultural contexts, and how such contexts are related to their own expectations and goals in life [10, 13, 14].

Internationally, there are several QoL measures for older adults including Older People's Quality of Life Questionnaire (OPQOL-35), the 19-item Control, Autonomy, Satisfaction and Pleasure Questionnaire (CASP-19) and the World Health Organization's Quality of Life Questionnaire - version for older people (WHOQOL-OLD) [15]. The OPQOL-35 is the first multidimensional measure of QoL which is derived directly from lay people's views of what gives or divests their lives quality [12]. It is a psychometrically sound instrument that is commonly utilized in assessing QoL among older adults globally.

Most (if not all) of the QoL scales were originally developed in English (and probably other European languages) that could not be understood by many older adults in low- and middle- income countries (such as Nigeria) who do not receive sufficient formal education. According to National Bureau of Statistics [16], the English literacy level among older adults in Nigeria is 42.1%. With this literacy level, a good proportion of older adults in Nigeria will not be able to understand nor complete the English version of the OPQOL-35. It is therefore imperative to make provision of a validated instrument suitable for use within Igbo population especially for older adults who are non-literate and can neither communicate nor understand English language. Igbo language is one of the three major native languages in Nigeria (spoken by about 18% of the whole Nigerian population) and a minor language in Equatorial Guinea, with over 24 million speakers [17–19]. Cross-culturally adapting instruments is usually preferred to development of new ones, as the former reduces the costs and the time spent in development and ensures ease of intercultural comparisons [20–22], while ensuring idiomatic, linguistic, and contextual equivalences in the target language [23]. Beaton et al. [20] guideline comprising steps of initial translation, synthesis of the translations, back translation, expert panel review, pretest and cognitive debriefing of the questionnaire is the frequently utilized and practiced guideline for cross-cultural adaptation [24]. The OPQOL-35 has been translated and validated in other languages: Iranian [25], Chinese [26], Czech [27], Indian [28], and Australian [29]. However, the OPQOL-35 has not been cross-

culturally adapted in Nigerian language and culture. This study was therefore designed to translate, cross-culturally adapt, and psychometrically evaluate the OPQOL-35 among the Igbo older adult population in Enugu State.

Methods

Design

This was a validation study that adopted the protocol for the American Academy of Orthopaedic Surgeons for cross-cultural adaptation developed by Beaton et al. [20]. An approval was obtained from the Ethical Review Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu before the commencement of data collection. Permission was obtained from the developers (Ann Bowling) to translate and validate the original English version of the OPQOL-35. Older adults who met the inclusion criteria were consecutively recruited from communities of conveniently selected local government areas in Enugu State (Enugu South, Enugu East, Igbo-etiti, Nsukka, Aninri), in the adaptation and validation phases. All participants were informed about the purpose and procedures of the study, and gave verbal or written informed consent. All participants were also made to understand that the study is voluntary and assured that all data obtained would remain confidential. The eligibility criteria for both the adaptation and validation phases of the questionnaire were inclusion of older adults (≥ 65 years) who could understand both English and Igbo languages; and were well-oriented in time, place and person. The socio-demographic information on age, gender, marital status, level of education, and occupational status of the respondents were obtained through oral interview.

Instruments for data collection

Older People's Quality of Life Questionnaire (OPQOL-35)

This is a 35-item questionnaire developed for assessing QoL among older adults. The 35 statements of the questionnaire consider the following 8 domains of QoL: life overall (4 items), health (4 items), social relationships and participation (8 items), independence, control over life and freedom (5 items), home and neighbourhood (4 items), psychological and emotional well-being (4 items), financial circumstances (4 items), and religion and culture (2 items). The participant is asked to indicate the extent to which he/she agrees with every single statement by choosing one of five possible options among "strongly agree", "agree", "neither agree nor disagree", "disagree", and "strongly disagree". Each of the five possible answers is given a score of 1 to 5. Items are scored (with reverse coding of positive responses) so that higher scores indicate a better QoL. Thus the total score ranges from 35 (the worst possible QoL) to 175 (the best possible QoL). The OPQOL-35 has been shown to have acceptable psychometric properties [12, 30-32].

Translation, cross-cultural adaptation and validation of the OPQOL-35

The present study adopted the guidelines for cross-cultural adaptation developed by Beaton et al. [20] for the American Academy of Orthopaedic Surgeons, which were in three stages: translation, adaptation and validation stages.

Translation stage

This stage involves forward translation of the items and response choices of the English version of the OPQOL-35 (E-OPQOL-35) into Igbo language by two independent bilingual translators, a linguist and a physiotherapist, whose native language is Igbo, with fluency in English to produce two Igbo translated versions (FT1 and FT2). The translators were instructed to aim for conceptual instead of literal translation; to provide a language translation as used by the population, and to offer a translation providing a more reliable equivalence from a measurement and clinical perspective. The two translators reconciled and synthesized the two translations to produce a single common version (ST-12). For items and responses that were linguistically or culturally ambiguous, the translators chose more preferred options after exhausting all available choices. The ST-12 was translated back to English language by two different bilingual translators for conceptual equivalence with the original English version, producing two back-translated English versions (BT1 and BT2). Both translators were physiotherapy lecturers who were fluent in both English and Igbo languages, and also knowledgeable in cross-cultural adaptation procedure. This was to validate the back translated English version by comparing it with the original English version, to check for mistakes and misinterpretations, in order to ensure the reproducibility of the same item content as the original version

Adaptation stage

All the translations including the original English version were examined by an expert committee review while ensuring operational, experiential, conceptual, measurement, idiomatic, and semantic equivalences. The expert panel comprised the four translators, four physiotherapy researchers, and a lay person. The expert committee were very familiar with the Igbo culture and environment, and identified the comprehensiveness, relevance and comprehensibility of the instructions, items and response options. Some modifications were made to some words and phrases. Differences in the translations were unanimously resolved, thus producing a pre-final Igbo version of the questionnaire.

This pre-final version was pretested on 30 consenting eligible older adults (54.8% female) who were recruited from conveniently selected five local government areas in Enugu State. These participants were taken through the process of cognitive debriefing interview in order to determine the clarity, perception, applicability, and understanding of various terminologies used on each item on the questionnaire and the responses. Each participant was expected to answer 'YES' or 'NO' for each item and response options. Items or response option with less than 80% positive answers were supposed to be amended. However, all the items had at least 95% positive answers. Hence, the final Igbo version of the OPQOL-35 (I-OPQOL) was accordingly developed.

Validation stage

The E-OPQOL and the I-OPQOL were either interviewer-administered or self-administered on the eligible older adults depending on participant's preference. A sample size of 112 had an 88% power to detect a moderate effect size of 0.3 at alpha level of significance 0.05. Sample size was calculated using G*Power 3.0.10 [33]. The purpose of administering the E-OPQOL was to ascertain the concurrent validity of the I-OPQOL. Simple randomization method was used to administer the questionnaires. Participants that picked 'I' responded to the I-OPQOL first while those that picked 'E' responded to the E-OPQOL first.

Data analysis

Analyses of data were performed using the Statistical Package for Social Sciences (SPSS) version 21. The demographic information and the scores from the I-OPQOL and the E-OPQOL were summarised using frequency counts and percentages, median, mean and standard deviation. The Spearman rank order correlation was used to determine the concurrent validity of the I-OPQOL. Scatter plot was used to pictorially illustrate the level of correlation between participants' total scores on the I-OPQOL and the E-OPQOL. The Bland-Altman plot was used to provide an indication of the homoscedasticity of the data. The Cronbach's correlation coefficient was used to determine the internal consistency of the I-OPQOL. The standard error of mean (SEM) and the minimal detectable difference (MDD) of the total and domain scores on the I-OPQOL were calculated. The MDD was estimated using the following formula: $MDD = 1.96 \times SEM \times \sqrt{2}$ [34]. Principal component analysis (PCA) was used to estimate the structural validity of the I-OPQOL.

In order to check the suitability of data for factorial analysis before performing the PCA, the Kaiser-Meyer-Olkin (KMO) and the Barlett's test of sphericity were used. The KMO value must exceed the recommended value of 0.6 [35] and Barlett's test of sphericity value must be significant [36]. When all the correlation matrix coefficients between each item pair on the I-OPQOL exceeded the recommended value of 0.3, it would reveal that all the items measured the same construct. Communality values that are less than 0.3 may indicate that the item did not fit well with the other items loading on the same component.

Throughout the PCA, only factors with its eigen values exceeding one are normally retained. The retained factors were further illustrated using the scree plot [37]. Any component with initial eigen value lower than the random eigenvalue are often rejected. The number of components to retain was decided by the Monte-Carlo parallel analysis. Level of significance was set at $p < 0.05$.

Results

Pilot testing of the pre final version of the I-OPQOL-35

The pre-final version of the I-OPQOL-35 was pretested on 30 older adults who were taken through cognitive debriefing interview. These participants had at least 95% of clarity and ease of understanding of most of the items except for three items (2, 4, & 24). These items were considered and modified at the second panel meeting based on the more suitable option for it. The 2nd item (I am happy much of the time) was modified from "A na m enwekari obi anuri" to "A na m enwe obi anuri otutu oge. The 4th item (Life gets me down) was modified from "Ndu na-akutu mmuo m" to "ndu kuturu m ala", and finally

the 24th item (I tend to look on the bright side), from “A na m enwe aṅurị na nchekwube na agbanyeghi ihe ọ bụla” to “A na m elegara anya na ihe ọma dị n’ọ̀nọ̀dụ niile”. No further modifications were made on the questionnaire, and hence, the final Igbo version of the OPQOL-35 was produced.

Validation of the I-OPQOL-35

Socio demographic profile of the participants

The socio demographic characteristics of the respondents are presented in Table 1. A total of 115 (male 45.2%, female 54.8%) older adult respondents participated in the psychometric testing. Majority of the participants (83.5%) were still married; 70.4% had at least a secondary education; 19.1% were retirees; while 40.1% were civil/public servants.

Validity and reliability analysis of the I-OPQOL-35

Concurrent validity

The coefficients of correlations between corresponding domain and total scores on the E-OPQOL-35 and the I-OPQOL-35 were all excellent and significant ($\rho=0.92-1.00$; $p<0.001$), with the “religion and culture domain” and “total” scores having the least and highest correlation coefficients respectively. This indicates excellent concurrent validity in all the total and domain scores on the I-OPQOL-35 (Table 2), thus suggesting that the E-OPQOL-35 and the I-OPQOL-35 can produce equivalent scores when administered to the same individuals. The scatter plots of the correlation between the total scores on the I-OPQOL-35 and the E-OPQOL-35 is shown in Fig 1. The Bland-Altman plot pictorially illustrates the total scores on the I-OPQOL-35 and the E-OPQOL-35, revealing homoscedasticity of both results (Fig. 2). A comparison between the domain scores on the E-OPQOL-35 and the I-OPQOL-35 using the Mann-Whitney U test showed no significant difference ($p>0.05$) in any of the domains, thus indicating the linguistic and conceptual equivalence of the two versions (Table 3).

Internal consistency

The Cronbach’s alpha for the domain-to-total correlation on the I-OPQOL-35 was 0.78. This value shows that the internal consistency was good, thus indicating that the items on the I-OPQOL-35 measure different aspects of the same construct. The standard error of mean and minimum detectable difference values for the domain and total scores on the I-OPQOL-35 are shown on Table 4. The MDD values ranged from 0.25 (Religion and Culture domain) to 4.82 (total score). Religion and culture domain and the total had the lowest and highest SEM scores respectively; thus, giving a better understanding of the responsiveness of the domain and total scores on the scale.

Structural validity of the I-OPQOL-35

The structural validity of the I-OPQOL-35 was performed using the Principal Component Analysis (PCA). Prior to performing PCA, the suitability of the data for factor analysis was assessed. The Kaiser-Meyer-

Olkin (KMO) value of 0.833 exceeded 0.6, which is the recommended value [35], while the Barlett's test of sphericity reached statistical significance ($\chi^2 = 2794.665$; $p < 0.001$), thus supporting reasonable factorability of the data.

The PCA revealed the presence of nine factors with eigenvalues exceeding 1, describing 34.088, 8.499, 6.186, 5.960, 4.335, 3.670, 3.321, 3.104, and 2.940 of the variances respectively. The nine component solution thus explained a total of 72.103% of the variances. Other factors had eigen values less than 1 (Table 5). The extraction is based on Kaiser criterion i.e., only factors that had eigen values greater than 1 are retained. Scree plot also illustrated the presence of these nine factors (Fig. 3). All the 35 scale items had communality values that were >0.3 which indicated that all the items fit well with one another, and are to be retained for use on the scale. Communality values that are <0.3 might indicate that the items do not share common variances with the other items loading on the same component (Table 6).

Table 1: Socio-demographic profiles of study participants

Parameters	Class	Frequency	Percentage (%)
Gender	Male	52	45.2
	Female	63	54.8
Marital status	Married	96	83.5
	Widowed	19	16.6
Occupation	Unemployed	3	2.6
	Farming	8	7
	Civil/public service	46	40.1
	Retirees	22	19.1
	Artisans	8	6.9
	Trading	28	24.3
Educational attainment	No formal education	2	1.7
	Primary	32	27.9
	Secondary	35	30.4

Table 2: Spearman Rank Order Correlation between the domains in the E-OPQOL-35 and I-OPQOL-35

Domains Rating	rho	p	
Life overall	0.95	<0.001	Excellent
Health	0.96	<0.001	Excellent
Social relationships	0.99	<0.001	Excellent
Independence control	0.98	<0.001	Excellent
Home and neighbourhood	0.99	<0.001	Excellent
Psychological and emotional	0.98	<0.001	Excellent
Financial circumstances	0.99	<0.001	Excellent
Religion and culture	0.92	<0.001	Excellent
Total	1.00	<0.001	Excellent

Key:

E-OPQOL-35: English version of the Older People's Quality of Life questionnaire

I-OPQOL-35: Igbo version of the Older People's Quality of Life questionnaire

Table 3: Mann Whitney U test comparing scores on both the E-OPQOL-35 and I-OPQOL-35 domain

Variable	Mean±SD English	Igbo	U	P
Life Overall	8.504±2.6	8.591±2.6	6506.5	0.83
Health	8.296±3.2	8.252±3.2	6543.0	0.89
SRPLS	12.70±4.4	12.63±4.3	6531.0	0.87
ICOLF	9.452±3.5	9.504±3.4	6554.0	0.91
H&N	6.887±2.8	6.913±2.8	6560.5	0.92
P&EW	7.017±2.6	7.174±2.7	6389.0	0.65
FC	10.97±4.5	10.97±4.5	6576.5	0.94
R&C	2.635±0.9	2.609±0.9	6511.0	0.81

Key:

E-OPQOL-35: English version of the Older People's Quality of Life questionnaire

I-OPQOL-35: Igbo version of the Older People's Quality of Life questionnaire

ICOLF: Independence, Control, Over Life and Freedom

SRPLS: Social Relationships, Participation, Leisure and Social Activities

FC: Financial Circumstances; R&C: Religion and Culture

P&EW: Psychological and Emotional Well Being; H&N: Home and Neighbourhood

Table 4: Standard error of mean and minimal detectable difference of the domain and total scores on the I-OPQOL-35

Variable	SEM	MDD
Life Overall	0.24	0.67
Health	0.30	0.83

SRPLS	0.40	1.11
ICOLF	0.32	0.89
H&N	0.26	0.72
P&EW	0.25	0.69
FC	0.42	1.16
R&C	0.09	0.25
Total	1.74	4.82

Key:

SEM: Standard error of mean; MDD: Minimal detectable difference

E-OPQOL-35: English version of the Older People's Quality of Life questionnaire

I-OPQOL-35: Igbo version of the Older People's Quality of Life questionnaire

ICOLF: Independence, Control, Over Life and Freedom

SRPLS: Social Relationships, Participation, Leisure and Social Activities

FC: Financial Circumstances; R&C: Religion and Culture

P&EW: Psychological and Emotional Well Being

H&N: Home and Neighbourhood

Table 5: Principal Component analysis of the I-OPQOL-35

Components Cumulative%	Initial Eigen values	Decision	Variances%
C1 34.088	11.931	Accepted	34.088
C2 42.587	2.975	Accepted	8.499
C3 48.773	2.165	Accepted	6.186
C4 54.734	2.086	Accepted	5.960
C5 59.069	1.517	Accepted	4.335
C6 62.739	1.284	Accepted	3.670
C7 66.059	1.162	Accepted	3.321
C8 69.164	1.087	Accepted	3.104

C9 72.104	1.029	Accepted	2.940
C10 74.940	0.993	Rejected	2.836
C11 77.289	0.822	Rejected	2.349
C12 79.569	0.798	Rejected	2.280
C13 81.665	0.734	Rejected	2.097
C14 83.683	0.706	Rejected	2.017
C15 85.441	0.615	Rejected	1.758
C16 87.186	0.611	Rejected	1.744
C17 88.695	0.528	Rejected	1.510
C18 90.042	0.471	Rejected	1.347
C19 91.179	0.398	Rejected	1.137
C20 92.216	0.363	Rejected	1.037
C21 93.219	0.351	Rejected	1.003
C22 94.189	0.339	Rejected	0.970
C23 95.021	0.291	Rejected	0.832
C24 95.762	0.259	Rejected	0.741
C25 96.400	0.223	Rejected	0.638
C26 96.940	0.189	Rejected	0.540
C27 97.459	0.181	Rejected	0.518
C28 97.949	0.172	Rejected	0.490
C29 98.412	0.162	Rejected	0.463
C30 98.816	0.141	Rejected	0.404
C31 99.183	0.128	Rejected	0.367
C32 99.482	0.105	Rejected	0.299
C33 99.752	0.095	Rejected	0.270
C34 99.912	0.056	Rejected	0.160

KEY: I-OPQOL-35: Igbo version of the Older People's Quality of Life questionnaire

Table 6: Communalities of the items on the I-OPQOL-15

Items	Initial	Extraction
I-OPQOL1	1.000	0.677
I- OPQOL2	1.000	0.706
I- OPQOL3	1.000	0.653
I- OPQOL4	1.000	0.675
I- OPQOL5	1.000	0.633
I- OPQOL6	1.000	0.728
I- OPQOL7	1.000	0.796
I- OPQOL8	1.000	0.656
I- OPQOL9	1.000	0.676
I- OPQOL10	1.000	0.744
I- OPQOL11	1.000	0.677
I- OPQOL12	1.000	0.893
I- OPQOL13	1.000	0.874
I- OPQOL14	1.000	0.761
I- OPQOL15	1.000	0.771
I- OPQOL16	1.000	0.773
I- OPQOL17	1.000	0.723
I- OPQOL18	1.000	0.645
I- OPQOL19	1.000	0.764
I- OPQOL20	1.000	0.734
I- OPQOL21	1.000	0.685
I- OPQOL22	1.000	0.675
I- OPQOL23	1.000	0.537
I- OPQOL24	1.000	0.671
I- OPQOL25	1.000	0.615
I- OPQOL26	1.000	0.876
I- OPQOL27	1.000	0.883
I- OPQOL28	1.000	0.874
I- OPQOL29	1.000	0.719
I- OPQOL30	1.000	0.739
I- OPQOL31	1.000	0.666
I- OPQOL32	1.000	0.707
I- OPQOL33	1.000	0.732
I- OPQOL34	1.000	0.698
I- OPQOL35	1.000	0.601

Key: Extraction Method Principal Component Analysis; I- OPQOL-35 Igbo version of the Older People's Quality of Life questionnaire

Discussion

This study was devised to cross-culturally adapt and validate the Igbo version of the OPQOL among Igbo older adults in Enugu following a widely accepted and standardized guideline [20]. More than half of this study's participants were females (54.8%). Females had been reported to attain old age more than males [38]. The study findings revealed that the OPQOL-35 is a multidimensional scale and has acceptable psychometric properties.

During the translation process, two different translators at each of the forward and backward translations were involved. It was also ensured that one of the forward translators had no medical background and that three of the translators were blinded about the concept of the instrument. This was to reduce the possibility of bias in the translation. All the items on the original version of the OPQOL-35 were considered by the expert panel to be of relevance for the measurement of QoL among Igbo-speaking older adults and environment. However, little modifications were made in order to ensure semantic, experiential and conceptual equivalence of the terms in Igbo Language and culture; in agreement with the recommendations by Beaton et al [20] that a newly adapted scale should comprise terms that are experientially equivalent in the new culture for which it was developed. Example, in the instruction section, the term "quality of life" was translated as "ogo uto ndu" which means "extent of life enjoyment" as there is no exact Igbo equivalent of "quality of life".

The OPQOL-35 has been translated into various languages and used in numerous countries (e.g. Iran [25], China [26], Czech [27], India [28], and Australia [29]). These translations are used in place of the original English version in these places and anywhere the speakers of these languages are found. Consequently, this could be obtainable with the I-OPQOL-35 and may be applicable to persons who speak the Igbo Language irrespective of where they find themselves. The Igbo language maintains a central cultural and linguistic pattern which is well understood across all Igbo-speaking regions and by all Igbo-speaking persons, despite its varying dialects. The translation into Igbo language which is one of the major native Nigerian Languages will aid the effectiveness of its use among speakers of Igbo language.

There was no significant difference in the total and domain scores of both the I-OPQOL-35 and E-OPQOL-35. Furthermore, there were significant correlations between the participants' total and domain scores on the Igbo and the English versions of the OPQOL-35, suggesting an excellent concurrent validity of the I-OPQOL-35, which suggests the equivalence of the I-OPQOL-35 and E-OPQOL-35 in concept, semantic and context. The original English or Igbo version of the OPQOL-35 can therefore be administered on an Igbo-speaking individual with the likelihood of obtaining the same result.

The I-OPQOL-35 showed good internal consistency demonstrated by a Cronbach's alpha value of 0.78 which falls within the acceptable range. This suggests that the items on the I-OPQOL-35 are homogenous and are all measuring various aspects of the same variable. Similarly, studies also reported good internal consistency for the OPQOL in different settings. This is consistent with previous reported values in the Czech (0.73-0.91) and Italian (0.78) versions [27, 31]. A 0.86 Cronbach's alpha value was also reported in Sri Lanka [8]. Soleimani et al. [39] had opined that though the Cronbach's alpha coefficient is improved by a large number of items, the high Cronbach's alpha value observed for the entire measure however may

not suggest a unidimensional measure. The SEM and MDD values of the I-OPQOL-35 reported in this study will be helpful in the future in knowing when a significant change is produced.

Findings from the principal component analysis demonstrated that nine factors had eigen values exceeding 1. This shows that the I-OPQOL-35 has nine domain scores which could be named as follows: 1 independence, control over life and freedom; 2 financial circumstances; 3 belief, home and neighbourhood; 4 loneliness; 5 leisure and activities; 6 health; 7 psychological and emotional wellbeing; 8 family, social relationships and participation; 9 Satisfaction with life. The nine components explained a total of 72.10% of the variance, with factor 1 (34.09) contributing the most to the variance. This finding of factor 1 contributing the most to the total variance observed, is in consonant with the study of Nikkhah et al. [25] and Bowling [40]. This suggests that the prevalent nature of older adults' perception of their life overall contribute the most to the assessment of QoL globally. Though the original version of the OPQOL contained eight factor structures which was based on open survey, its PCA revealed 9 components whose eigenvalues were greater than 1, accounting for 60.583% of the total variance [40]. In Iran and China, eight factors with eigenvalues greater than one, accounting for 67.4% and 63.7% of the variance respectively were reported [25, 26]; in Czech, seven factors explained 62.3% of the total variance [27]. This could suggest the ambiguity and multidimensionality of the factor structure of OPQOL. Furthermore, factor nine had only two items with highest loadings, and so, could be merged with others to ensure a more stable factor structure.

Factor analysis usually answers the question of validity and provides a diagnostic tool to evaluate the suitability of the data in terms of pattern and structure, thereby determining the accuracy of the said tool in measuring what it is designed to measure [41, 42]. Kaiser [35] recommends that only KMO value greater than 0.6 is acceptable. KMO values that are less than this usually leads to either collection of more data or an evaluation of the items to be incorporated. The present study has a KMO value of 0.83 which is highly acceptable. The Bartlett's test of sphericity also revealed that $p < 0.001$ which is highly significant, thus suggesting that factor analysis was appropriate.

Limitations

Certain limitations of this study should be recognized. Individuals who were unable to understand English Language were excluded from the study, which might have introduced some degrees of bias. This was a fundamental requirement of the adopted protocol, and hence the investigators had no control over this eligibility criterion.

Conclusions

The translated version of the Older People's Quality of Life- 35 (I-OPQOL) is a valid and reliable instrument. It can be used for measuring quality of life among older adults in Igbo land, Southeast Nigeria. It is recommended that the I-OPQOL be translated and validated into other major languages in Nigerian (Yoruba and Hausa) and international languages. The availability of this tool in numerous

languages would enhance its applicability across various cultures. Further researches should be performed to explore the responsiveness and predictive validities, inter-rater and intra-rater reliabilities of the I-OPQOL.

Abbreviations

OPQOL

Older People's Quality of Life questionnaire

E-OPQOL

English version of the Older People's Quality of Life questionnaire;

I-OPQOL

Igbo version of the Older People's Quality of Life questionnaire;

T1

First forward translation of the Older People's Quality of Life questionnaire;

T2

Second forward translation of the Older People's Quality of Life questionnaire;

T12

Synthesized Igbo version of the Older People's Quality of Life questionnaire;

BT1

First backward translation of the Older People's Quality of Life questionnaire;

BT2

Second backward translation of the Older People's Quality of Life questionnaire;

SEM

Standard error of mean;

MDD

Minimal detectable differences;

PCA

Principal component analysis

ICOLF

Independence, Control, Over Life and Freedom

SRPLS

Social Relationships, Participation, Leisure and Social Activities

FC

Financial Circumstances

P&EW

Psychological and Emotional Well Being

H&N

Home and Neighbourhood

R&C

Religion and Culture

Declarations

Ethics approval and Consent to participate

This was obtained from the Ethical Review Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu. Participants were provided with information sheet which contained the detail of what the study was all about. Participants signed a statement of informed consent

Consent for publication

Not applicable

Availability of data and materials

The dataset used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Author contributions

UGM designed the study, reviewed literature and prepared the manuscript. COA participated in manuscript design, preparation and review. CCE participated in literature review and data collection. ECO took part in designing the study, analyzed data and reviewed literature. ENE participated in manuscript writing. AJO took part in designing the work. CNI participated in literature review. All authors read and approved the final manuscript.

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Figures

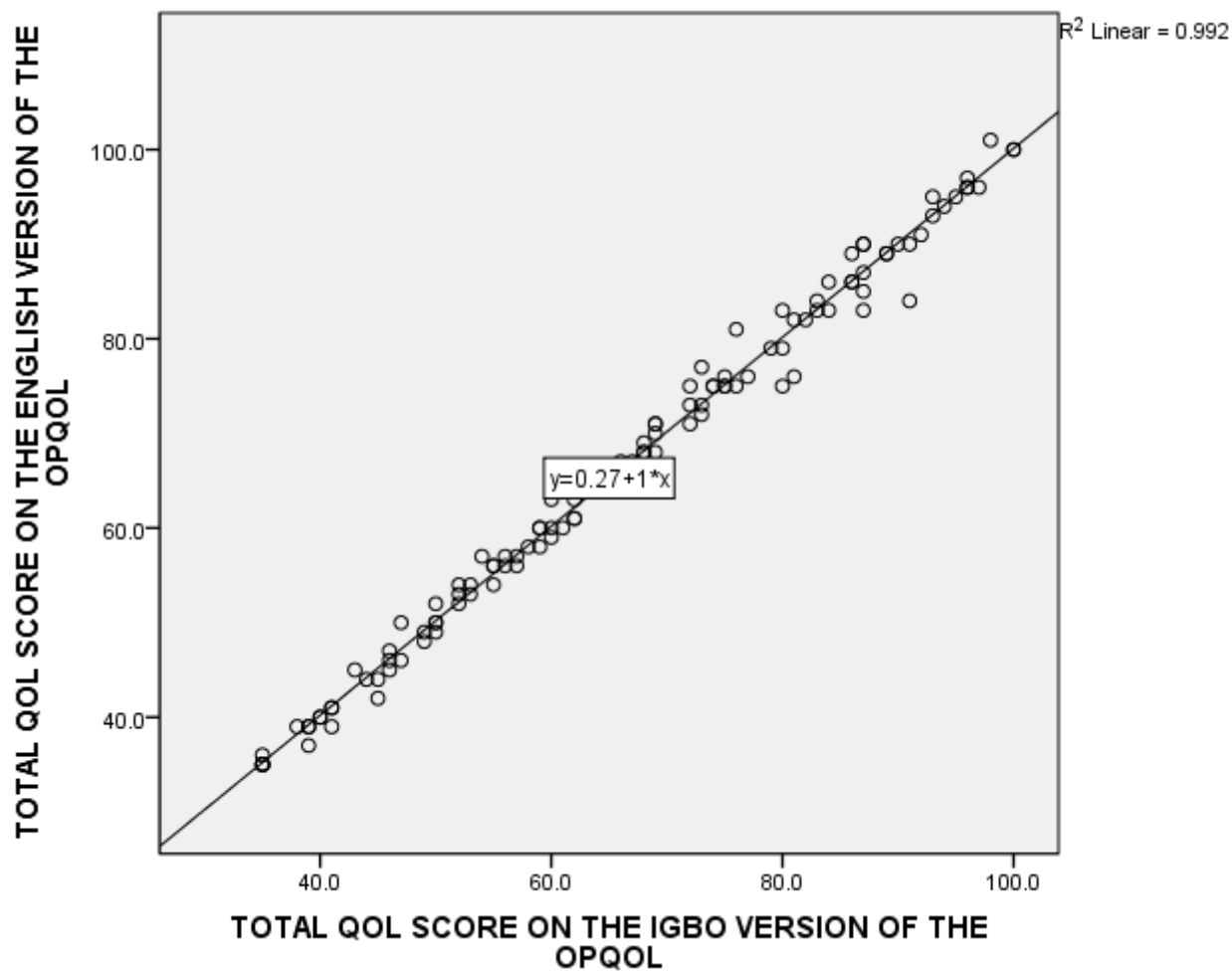


Figure 1

Scatter diagram for total scores on the I-OPQOL-35 and the E-OPQOL-35

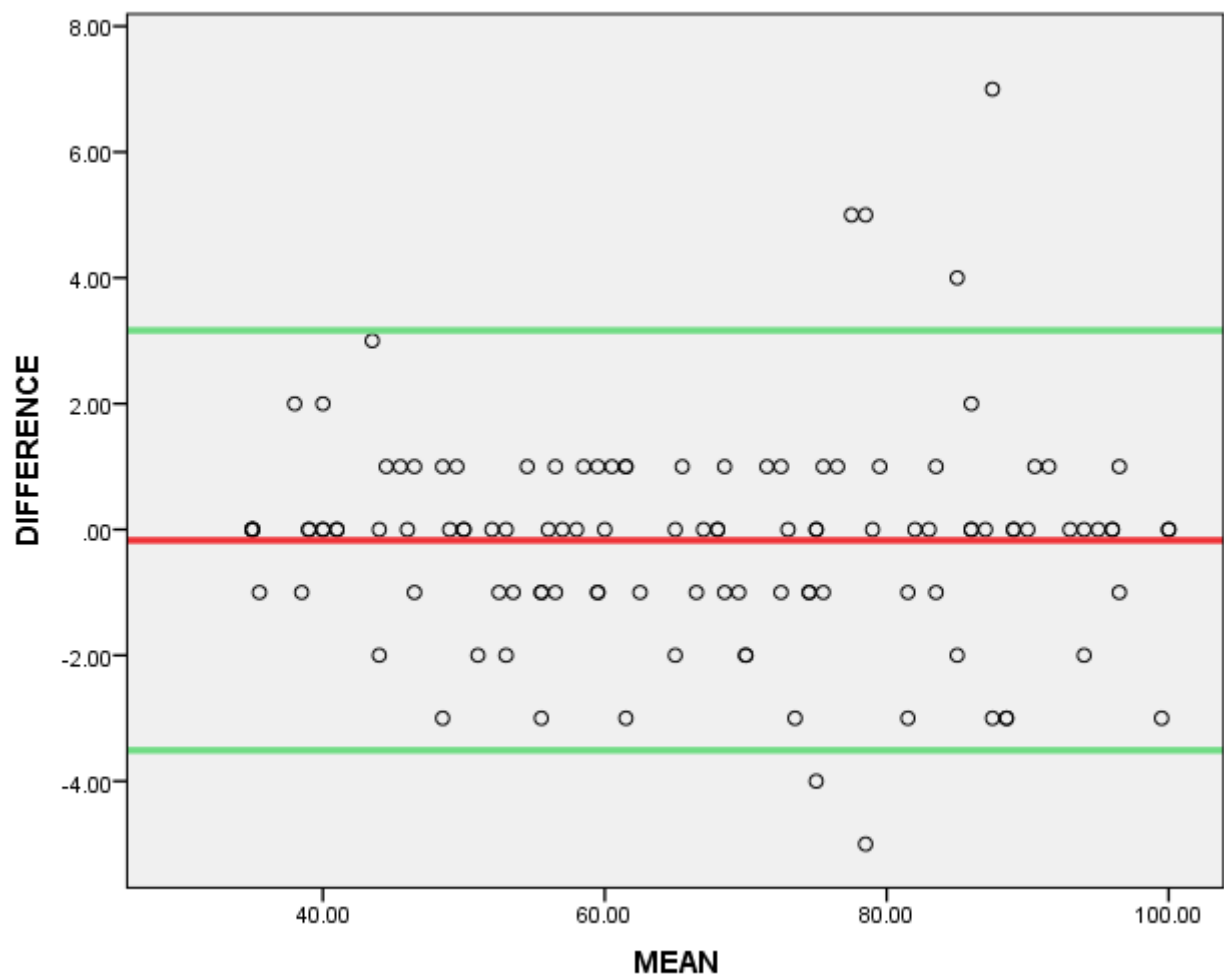


Figure 2

Bland-Altman plot of the total scores on the I-OPQOL-35 and the E-OPQOL-35

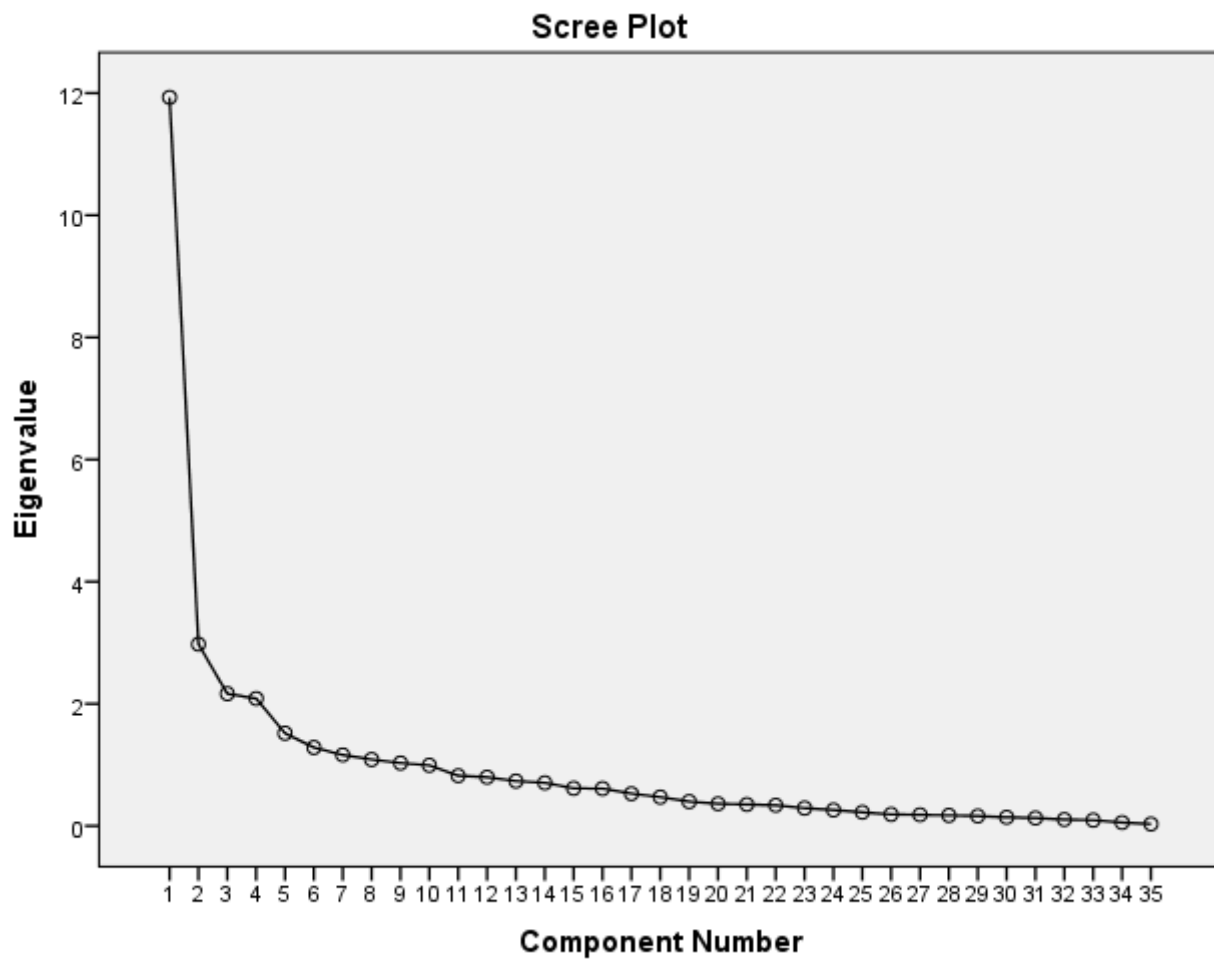


Figure 3

Scree plot of the components on the Igbo version of the I-OPQOL-35