Original Article

The Indian Geriatrics Quality of Life Inventory Scale (IGQOLI): Development and Validation of a Scale to Evaluate the Quality of Life among Geriatric Population of India

Dharmita Yogeshwar*, Janvhi Singh, Ajeet Kumar Saharan, Shantanu Sharma, Anuja Choudhary, Manoj Kumar Mathur, Hari Narayan Saini, Drishti Sheokand

Department of Physiotherapy, NIMS College of PT & OT, NIMS University, Jaipur, India

*Corresponding author:
ⓘ Dharmita Yogeshwar
Department of Physiotherapy,
NIMS College of PT & OT, NIMS
University, Jaipur,
Rajasthan 303121, India
Tel: +91-9460592750
E-mail:
yogidharmita@gmail.com

Background: Quality of life (QOL) refers to an individual's perception of their overall life and well-being. As people age, their QOL often deteriorates. Although various outcome measures exist to assess QOL, most are limited in scope and not specific to the Indian ethnicity of geriatrics. Therefore, a new outcome measure was developed and validated to more accurately evaluate the QOL for the geriatric population in India.

Methods: The outcome measure was developed in three stages, followed by validation. Data was collected using multistage cluster sampling from 13 subdivisions of Jaipur district. A total of 423 participants were interviewed face-to-face. The collected data was analyzed using SPSS version 20, and the reliability and validity of the outcome measure were assessed.

Results: The Indian Geriatrics Quality of Life Inventory (IGQOL) scale demonstrated excellent reliability, with a Cronbach's alpha (α) of 0.95 and an intraclass correlation coefficient of 0.93. The measure also exhibited excellent face and content validity, with a K value of 1. Correlation analysis revealed a significant relationship with other outcome measures, with a Pearson correlation coefficient value of > 7 and a p-value of < 0.05.

Conclusion: The study concludes that the IGQOLI scale is a reliable and valid outcome measure for evaluating the QOL in the geriatric population in India.

Keywords: Geriatrics, India, Lifestyle, Patient reported outcome measure, Quality of life

INTRODUCTION

Quality of life (QOL) is multidimensional component which includes various aspects such as 'health status', 'lifestyle', 'life satisfaction' and 'mental well-being' [1,2]. World Health Organization (WHO) defined QOL "an individual's perception of life in the context of culture and value system in which he or she lives and in relation to his or her goals, expectations, standards, and concerns" [3].

Aging is defined as a process of deterioration in the functional capacity of an individual that results from structural changes, with advancement of age [4]. By 2020 people with the age of 60 years was considered as older [2,4,5]. Geriatric population is increasing worldwide with health-related problems but Limitation of physical activity, presence of chronic illness and old age does not always mean a decline of life quality [5]. It can also be work as a supporting factor such as social integration, optimism, confidence and desire to living a fulfilling life [5,6].

However, in India, only few studies have explored geriatric health problems, particularly mental health disorders and QOL [6-9]. There is strong association between health and QOL [1]. Which can be assessed using Health Related QOL (HRQOL) measure [2,5,6]. Various factors are responsible impaired QOL and which are underdiagnosed or undertreated. The failure to treat these factors increases the risk for symptomatic worsening, relapse, recurrence and may potentially decrease patients' overall QOL [8-10].

There are various outcome measure used to evaluate the quality of life of geriatric such as Older People's Quality of Life Questionnaire (OPQOL), World Health Organization Quality of Life questionnaire - version for older people (WHOQOL-OLD), QOL questionnaire (36-item short form survey [SF-36]), Schedule for the Evaluation of Individual Quality of Life-Direct Weighting, Older indigenous people specific QOL [11,12]. All these outcome measures are consisting of limited components, questions and domains which need to be address in one outcome measure for Indian population. According to EuroQol guidelines there are five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression which can use to evaluate the QOL in Indian population [13]. So the present outcome measure was developed on the basis of International Classification of Functioning, Disability and Health (ICF) model and considering the EuroQol guidelines for Indian population to evaluate the QOL of geriatric population. As the age progressed the subjects will be suffering with various issues related with physical [14], social and psychological aspects this should be consider from the age prospectives of geriatrics.

Considering the QOL its necessary to assess the health behavior of geriatric population but the existing outcome measure is not covering all the necessary components which needs to be address. So, the present outcome measure was developed to evaluate the QOL of geriatric population.

MATERIALS AND METHODS

1. Study design

The observational study was conducted in Jaipur, Rajasthan.

2. Phases of scale development

According to a systemic review conducted by Boateng et al. [15] in 2018, the outcome measure is developed and validate into 3 phases. First phase is Item development in which the domain and subdomain is developed. The second phase is Scale development in which all the extra components of scales will be removed and pre-required survey will be done to evaluate scale components and final version of scale will be developed. Third phase is Scale evaluation in which reliability and validity of scale will be assessed. These 3 steps were followed to develop and validate the present outcome measure. The detailed description is as follows.

1) Phase 1. Item development-step 1: identification of the domain(s) and item generation

(1) Domain identification

Indian geriatrics QOL inventory scale is consisting of 4 domains physical, activity of daily living (ADL), social and psychosocial. All the components are based in ICF model to evaluate the QOL in geriatric population of India.

(2) Item generation

There are two methods to develop questions: deductive and inductive methods (Boateng et al. [15]) The deductive method is based on identification of items through literature review and assessment of existing scales and inductive method, involves the generation of items from the responses of individuals through the interviews. In present study various outcome measure was reviewed SF-36, OPQOL-35, WHOQOL-OLD version and various search engines were used for this including Google scholar, PubMed, web of science and Scopus. In Indian Geriatrics Quality of Life Inventory (IGQOLI) scale both methods were used to develop the outcome measure. The items of scale were selected on the basis of physical changes of body, ADL components of geriatrics, social changes of individual's life and psychological components of life which is commonly seen in geriatric population. All the components consist of questions which is related to the geriatric subjects and all the questions con-

sists of 5 grading (1-5): 1, strongly agree; 2, agree; 3, neither agree or disagree; 4, disagree; 5, strongly disagree. The scale is covered almost every component which is going to affect the subject at all the aspects of physical, ADL, social and psychological level.

2) Step 2: content validity

To evaluate the qualitative content validity the outcome measure was validated by eight physiotherapists with seven-plus year of experience and who were engaged in clinical practice. After the validation final version of scale was developed with 4 domains and 35 items. For quantitative evaluation alpha Cronbach value and intraclass correlation coefficients (ICC) value was used to find out the content validity of IGQOLI scale [15].

3. Phase 2 scale development

The developed outcome measure was given to 20 subjects to evaluate that whether the participants were able to un-

derstand all the questions and able to answer the questions correctly or not. After collecting the response from the participants all required modifications was done in the scale and the final version of the scale was developed [15,16].

The complete scale development is given in Fig. 1 and the IGQOLI scale is attached with in the Supplementary File 1.

4. Phase 3 scale evaluation

1) Internal consistency

Internal consistency measures the strength of the relationships between the items and the appropriateness of scoring the items together in one scale. Cronbach's alpha was used to examine internal consistency. Inter-item correlations of 0.8 or more and item-to-total correlations of 0.2 or more were considered acceptable [15-17].

2) Test–retest reliability

Reliability was estimated using the reliability coefficients (ICC). To assess how consistent their scores across time. A
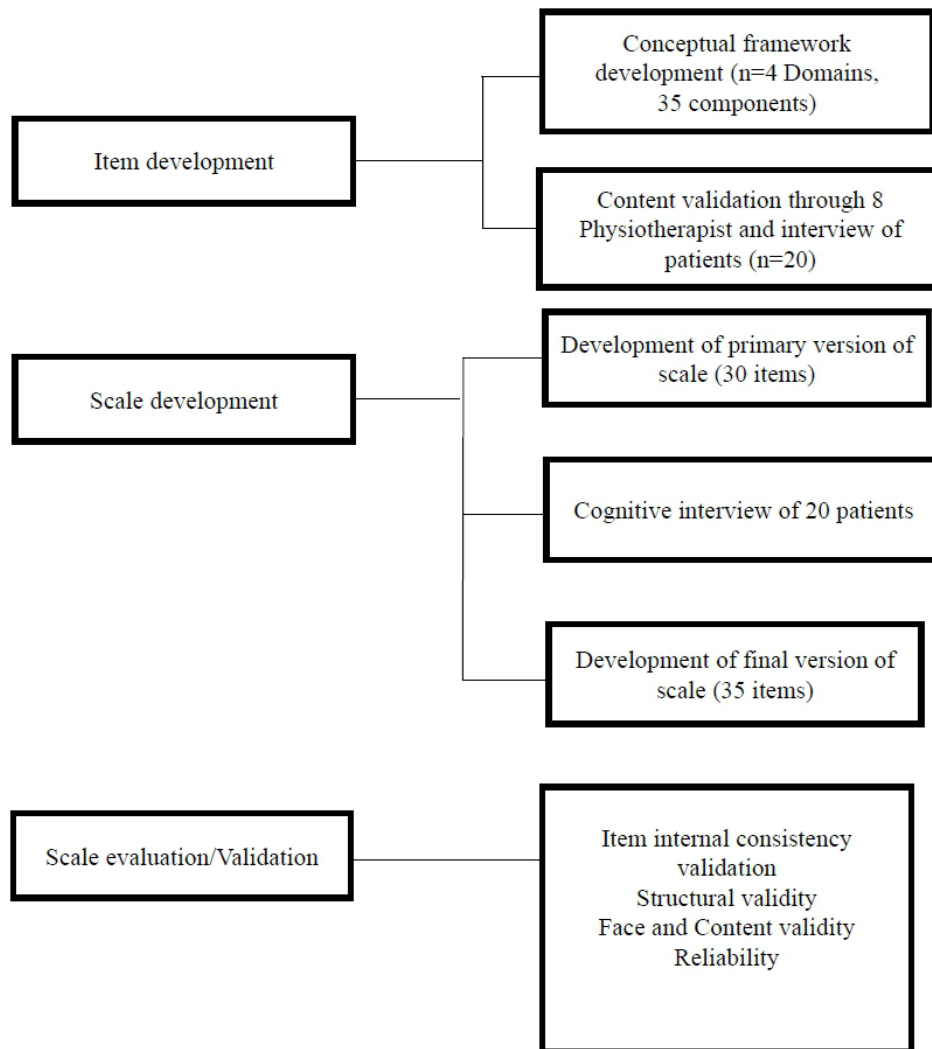

Fig. 1. Development and validation of Indian Geriatrics Quality of Life Inventory scale.

value between 0.4 to 0.75 is considered as good reliability. More than 0.75 consider as excellent reliability [15-17].

3) Face validity and content validity

For face and content validity the outcome measure was given to experts with 8 years of experience and who were working in field of Orthopaedic, Neurology, Community and Geriatric physiotherapy. The outcome measure was evaluated for its language, wordings, ease of understanding and administration. The process and correction were continued till we received 90 percentage of consensus. For content validation, all the experts were requested to score each item of the questionnaire from 1 to 3 where 1 indicated "rejected", 2 indicated "accepted with modification", and 3 indicated "accepted". This process was continued till the grade 3 score was accepted from all the experts [17,18].

4) Convergent validity and correlation analysis

Convergent validity to examine if the same concept measured in different ways yield similar results. Estimate the relationship between scale scores and similar constructs using multi-trait multi-method matrix or Pearson product-moment coefficient; higher/stronger correlation coefficients suggest support for convergent validity [15-17]. It is used to determine the relationship between existing measures and newly developed scale scores. Correlate scale scores and existing measures or using ICC and analysis of standard deviations of the differences between scores is used.

5) Study setting and sampling

After the ethical approval of institutional ethical committee data was collected from Jaipur. A door-to-door survey method was used to collect the data. Total 423 community dwelling older adults (> 60 and < 85 year of age) both male and females were included in the study who were able to communicate and had intact cognitive functioning. Data was collected from 13 different subdivision of Jaipur district. A multistage cluster sampling method was used to collect the data [1]. The total sample size was 384 on the basis of 13 subdivision and population of Jaipur (approximately 4,00,0000) and 10 percentage of drop out was added and final sample size was 423 with 95 percentage of confidence interval and 5 percentage of error, 50% of expected frequency and final sample size (423) was calculated with epi

Table 1. Demographic data

Components	Mean ± SD
Age (61-84 years)	78.19 ± 12.05
Sex	1.53 ± 0.500
Male (n = 200)	
Female (n = 223)	

Values are presented as mean±standard deviation.

info software with version 7. Total sample size was divided among 13 subdivision of Jaipur and followed by data was collected and follow by 100 participants were secured for test-retest reliability. A prior consent was taken from all the participants to participate in the study and who were willing to participate were included in the study.

6) Scale administration

The IGQOLI scale is a patient reported outcome measure. The prior instructions were given to all the participants before scale administration. All the information about the outcome measure and grades were explained to the subjects in details before the administration of outcome measure. If it was required to translate the outcome measure to their local language it was done by the person who were helping in scale administrator. Interviews was carried out face-to-face method.

RESULTS

Total 423 subjects participated in the study out of them 200 were males and 223 were females with the means value of 1.53±0.500. All the subjects above the age of 60 and below 85 years were included in the study with the mean value of 78.19±12.05. As shown in Table 1.

1. Face validity and content validity

Face and content validity of outcome measure is excellent according to the expert opinion as shown in Table 2. The outcome measure is consisting of 4 domains Physical, ADL, Social, Psychological (A, B, C, D) all the experts grade the components into grade 3, from 1 to 3 where 1 indicated "rejected", 2 indicated "accepted with modification" and 3 indicated "accepted". It is showing that the outcome measure is consists of excellent qualitative validity. As shown in Table 2.

For quantative content validity, content validity ratio (CVR) and content validity index (CVI) was used [18-20].

1) CVR was calculated with the following formula:

Table 2. Face validity

Item	Scoring from experts (after 3 rounds)								Overall content and face validity
	V1	V2	V3	V4	V5	V6	V7	V8	
A	3	3	3	3	3	3	3	3	Accepted
B	3	3	3	3	3	3	3	3	Accepted
C	3	3	3	3	3	3	3	3	Accepted
D	3	3	3	3	3	3	3	3	Accepted

Here, V1, V2, V3 showing the response of experts and A, B, C, D are the 4 domains Physical, ADL, Social, Psychological.

$$CVR = \frac{\{Ne - (N / 2)\}}{N / 2}$$

Where, Ne = number of experts indicating accept, N = total number of expert, CVR value more than 0.62 was approved [18].

2) I-CVI was calculated using below formula:

$$CVI = \frac{Number\ of\ experts\ offering\ rating\ 3}{Number\ of\ total\ experts}$$

Interpretation of I-CVIs: > 0.79, appropriate; 0.70-0.79, needs revision; < 0.70, eliminated.

3) Modified Kappa (K) for chance agreement was calculated using below formula used [18-20]:

$$K = \frac{(I - CVI) - Pc}{1 - Pc}$$

Where, probability of chance agreement (Pc) was calculated using below formula:

$$Pc = \{N / A (N - A)\} \times 0.5N$$

Here, N = number of experts in a panel, A = number of experts who agree that the item is relevant. Interpretation of the K values [18]: > 0.74, excellent; 0.60-0.74, good; 0.40-0.59: fair.

4) Proportion of agreement was calculated using below formula [18-20]:

$$Proportion\ of\ agreement = \frac{Number\ of\ experts\ who\ were\ in\ favor\ of\ questionnaire}{Total\ number\ of\ experts}$$

Table 3. Content validity

No. of items	I-CVI	K	No. of expert's agreement	Proportion of agreement
A	1	1	8	1
B	1	1	8	1
C	1	1	8	1
D	1	1	8	1

A, B, C, D are the four components/domains of scale.
I-CVI: item level content validity index, K: modified Kappa.

Table 4. Item analysis and test-retest reliability

	Analysis	Value
Item analysisitem analysis	Intraclass correlation coefficient (ICC)	0.93
	Cronbach's alpha (α)	0.95
Test-retest reliability	Pre-mean score of Indian Geriatrics Quality of Life Inventory (IGQOL)	20 ± 2.344
	Post-mean score of IGQOL (after a week)	20 ± 2.886

As shown in Table 3.

2. Reliability

ICC and Cronbach's alpha (α) is showing good reliability of 0.93 and 0.95. The mean score of outcome measure was checked after one week for test-retest reliability and both components are showing significant reliability of IGQOLI scale with mean value of 20±2.886. As shown in Table 4.

3. Correlation analysis

Correlation analysis was done using Pearson correlation coefficient. The present outcome measure IGQOLI was compared with WHOQOL, OPQOL, QOL (SF-36). The correlation coefficient is showing the significant correlation with IGQOLI scale with the significant p-value < 0.05. This shows that the IGQOLI scale is valid outcome measure. As shown in Table 5.

DISCUSSION

The present study was conducted to develop and validate the IGQOLI scale. It was found that IGQOLI is reliable and valid outcome measure and it can be used to evaluate the QOL of geriatric QOL.

There are various outcome measures present which is developed and validate to evaluate the QOL of geriatrics. Out of them some are very long and time consuming also and its difficult of understand. Geriatrics health behavior questionnaire is 22 item and 8 domain outcome measure which is multidimensional outcome measure used to evaluate various aspects of health status [1], which is short but the domains are more in number but in present study all the

Table 5. Correlation analysis

Measures	Pearson correlation	p-value
WHOQOL	0.868	0.025
OPQOL	0.769	0.015
QOL (SF-36)	0.765	0.000

WHOQOL: World Health Organization Quality of Life Questionnaire, OPQOL: Older People's Quality of Life Questionnaire, QOL: Quality of life, SF-36: 36-item short form survey.

components are categorized according to ICF model and EuroQol guidelines. All the questions are categorized according to the domain and during the scale development it was considered that all the questions are correctly suits the domain and cover all the aspects of QOL. These domains are physical, ADL, social, psychological these components will not be affected by gender of subjects [6].

Nottingham Health Profile is used to measure the HRQOL of subjects emotional, social, and physical health problems it is consists of 38 questions and 6 different categories [2,21]. In present study all the questions which are related with QOL and some are related with HRQOL so, IGQOLI can be used to measure the QOL and HRQOL.

A study conducted by Wong et al. [22] shows that QOL of life is affected by environmental, social and psychological factors, smoking is one of the components which indirectly affecting the QOL of subjects. World Health Organization Quality of Life Brief Version (WHOQOL-BREF) was used to evaluate the QOL in the study [22,23]. In present study IGQOLI scale was used which is consisting of physical, ADL, social, psychological domains which cover over all aspects of QOL of geriatrics. In WHOQOL-BREF scale environmental component is present which is not present in IGQOLI scale but questions which were related with environmental component can relate with social and psychological domain so it is modified in IGQOLI scale and a short and easy to understand outcome measure was developed. Moreover, that WHOQOL-BREF is consisting of limited components considering the Indian population, which is required to update to evaluate the QOL. Smoking and drinking alcohol are the part of daily routine in some rural and urban communities and family, according to a study conducted in India 71.8% of men and 41.4% of women's are smoke and consume alcohol so it was considered in present outcome measure also [24].

According to a systemic review conducted by Siette et al. [25] it was studied that which outcome measure is more reliable to evaluate the QOL of geriatrics and it was found that physical, emotional, social and existential components are required to evaluate the QOL and most of the outcome measure are lacking of all these components. So while choosing the outcome measure for geriatrics population it is necessary to select the correct outcome measure to evaluate the QOL. As such there is no standard outcome measure which can be used for QOL assessment [25]. So the IGQOLI scale was developed considering this situation although the sale was developed for Indian population but it can be further assessed for its validity for other countries.

Ethnicity is a particularly significant element in evaluating QOL in the case of older persons. Gallardo-Peralta et al. [26] conducted a study in 2018 to evaluate the QOL in indigenous and non-indigenous older person of Chile with WHOQOL-BREF scale and it was found that the QOL of populations is depends upon the ethnicity of subjects. The present outcome measure was developed considering the Indian population but variations can be seen between the rural and urban population but the outcome measure was develop considering both populations. It is very necessary to develop the outcome measure considering the ethnicity of subjects [27,28]. In present study all the components were considering the lifestyle if Indian population while collection of data, data was collected from different areas of Jaipur and all the subjects who were fulfilling the inclusion criteria were included in the study.

OPQOL questionnaire is seven component and 35 question measure. The number of questions is similar in both the outcome measure but the number of domains is more in OPQOL scale [29,30]. The questions are not properly categorized and suitable for Indian population. In IGQOL Scale all the efforts were made to categorized the components according to domain and lifestyle of Indian population.

IGQOLI scale is reliable and valid outcome measure which can be used to evaluate the QOL of Indian geriatrics population. There are various outcome measure present but some are not clearly understandable and lacking with some components. So the IGQOLI scale was developed considering the problems and it is easy to understand and administer with excellent reliability and validity.

CONCLUSION

The study concludes that IGQOLI scale is reliable and valid outcome measure which can be used to evaluate the QOL of geriatrics population. The study considers the physical, ADL, social and psychological domains considering QOL. All the components are reliable and valid considering the qualitative and quantative aspects. It was considered while developing the outcome measure that all the necessary components will be covered in IGQOLI scale so it can be easily used to assess QOL. So, the study concludes that IGQOLI scale is reliable and valid outcome measure which can be used for Indian geriatrics population to evaluate the QOL.

1. Limitations

The outcome measure was developed considering only the Indian geriatric population and considering ethnicity of Indian culture.

2. Future recommendations

Validation of outcome measure can be check on the geriatric population of other countries along with that scale

translation can be done in different languages.

NOTES

- **ORCID**
  Dharmita Yogeshwar,
  https://orcid.org/0000-0001-8847-4857
  Janvhi Singh,
  https://orcid.org/0000-0003-3588-8049
  Ajeet Kumar Saharan,
  https://orcid.org/0000-0003-4807-8715
  Shantanu Sharma,
  https://orcid.org/0000-0001-6517-4229
  Anuja Choudhary,
  https://orcid.org/0009-0008-1402-1319
  Manoj Kumar Mathur,
  https://orcid.org/0009-0003-5129-1178
  Hari Narayan Saini,
  https://orcid.org/0009-0000-5921-3527
  Drishti Sheokand,
  https://orcid.org/0000-0001-8247-0855
- **Authors' contributions:** D.Y., J.S., and A.K.S. participated in conceptualization. S.S., A.C., and M.K.M. participated in curated the data. D.Y., A.K.S., and H.N.S. participated in conducting the formal analysis. J.S., D.S. participated in conducting the project administration. A.K.S., D.Y., and A.C. supervised the study. S.S., H.N.S., and A.K.S. provided validation. M.K.M. and S.S. participated in drafting visualization. D.Y., J.S., and A.K.S. wrote the original draft of the manuscript. S.S., A.C., and M.K.M. participated in writing – review & editing.

SUPPLEMENTARY MATERIALS

Supplementary data is available at https://doi.org/10.15280/jlm.2024.14.2.80

REFERENCES

1. Bakhshandeh Bavarsad M, Foroughan M, Zanjari N, Ghaedamini Harouni G, Jorjoran Shushtari Z. Development and validation of the geriatrics health behavior questionnaire (GHBQ). BMC Public Health 2022;22(1):526.
2. Muszalik M, Kornatowski T, Zielińska-Więczkowska H, Kędziora-Kornatowska K, Dijkstra A. Functional assessment of geriatric patients in regard to health-related quality of life (HRQoL). Clin Interv Aging 2014;10:61-7.
3. Shah VR, Christian DS, Prajapati AC, Patel MM, Sonaliya KN. Quality of life among elderly population residing in urban field practice area of a tertiary care institute of Ahmedabad city, Gujarat. J Family Med Prim Care 2017;6(1):101-5.
4. Harman D. The free radical theory of aging. Antioxid Redox Signal 2003;5(5):557-61.
5. Oztürk A, Simşek TT, Yümin ET, Sertel M, Yümin M. The relationship between physical, functional capacity and quality of life (QoL) among elderly people with a chronic disease. Arch Gerontol Geriatr 2011;53(3):278-83.
6. Barua A, Mangesh R, Kumar HN, Saajan M. Assessment of the domains of quality of life in the geriatric population. Indian J Psychiatry 2005;47(3):157-9.
7. Hudakova A, Hornakova A. Mobility and quality of life in elderly and geriatric patients. Int J Nurs Midwifery 2011;3(7):81-5.
8. World Health Organization (WHO), Regional Office for the Eastern Mediterranean. Health care for the elderly: A manual for primary health care workers. WHO;1994;1-57.
9. Joubert J, Bradshaw D. Population ageing and health challenges in South Africa. In: Steyn K, Fourie J, Temple N, editors. Chronic diseases of lifestyle in South Africa: 1995-2005. South African Medical Research Council;2006;204-19.
10. World Health Organization (WHO). The World health report : 2001 : Mental health : New understanding, new hope [Internet]. WHO; 2001 [cited 2024 Jun 2]. Available from: https://iris.who.int/handle/10665/42390
11. Bowling A, Stenner P. Which measure of quality of life performs best in older age? A comparison of the OPQOL, CASP-19 and WHOQOL-OLD. J Epidemiol Community Health 2011;65(3):273-80.
12. Ratcliffe J, Khadka J, Crocker M, Lay K, Caughey G, Cleland J, et al. Measurement tools for assessing quality of life, consumer satisfaction and consumer experience across residential and in-home aged care: Summary report. Caring Futures Institute, Flinders University; 2021. p27.
13. Jyani G, Prinja S, Garg B, Kaur M, Grover S, Sharma A, et al. Health-related quality of life among Indian population: The EQ-5D population norms for India. J Glob Health 2023;13:04018.
14. Singh J, Vyas N, Popli S, Banarwal S. Comparison of posture and anthropometric covariates of physically active and sedentary individuals in elderly population. Eur Chem Bull 2023;12(Special Issue 10):55-64.
15. Boateng GO, Neilands TB, Frongillo EA, Melgar-Quiñonez HR, Young SL. Best practices for developing and validating scales for health, social, and behavioral research: A primer. Front Public Health 2018;6:149.
16. van der Wees PJ, Verkerk EW, Verbiest MEA, Zuidgeest M, Bakker C, Braspenning J, et al. Development of a framework with tools to support the selection and implementation of patient-reported outcome measures. J Patient Rep Outcomes 2019;3(1):75.
17. Roach KE. Measurement of health outcomes: Reliability, validity and responsiveness. J Prosthet Orthot 2006;18(6):P8-P12.

18. Nariya D, Khatri S. Reliability and validity of Gujarati version of Epworth Sleepiness Scale: A cross-sectional study. J Clin Diagn Res 2022;16(3):YC01-4.

19. Lawshe CH. A quantitative approach to content validity. Pers Psychol 1975;28(4):563-75.

20. Lynn MR. Determination and quantification of content validity. Nurs Res 1986;35(6):382-5.

21. Henchoz Y, Büla C, Guessous I, Goy R, Dupuis M, Santos-Eggimann B. Validity of the older people quality of life-7 domains (OQoL-7) scale. Health Qual Life Outcomes 2020;18(1):340.

22. Wong FY, Yang L, Yuen JWM, Chang KKP, Wong FKY. Assessing quality of life using WHOQOL-BREF: A cross-sectional study on the association between quality of life and neighborhood environmental satisfaction, and the mediating effect of health-related behaviors. BMC Public Health 2018;18(1):1113.

23. Sarkar A, Mohapatra I, Rout R. Assessment of quality of life among the geriatric population in an urban slum settlement of Bhubaneswar, Odisha. Cureus 2023;15(8):e43664.

24. Goswami A, Reddaiah VP, Kapoor SK, Singh B, Dwivedi SN, Kumar G. Tobacco and alcohol use in rural elderly Indian population. Indian J Psychiatry 2005;47(4):192-7.

25. Siette J, Knaggs GT, Zurynski Y, Ratcliffe J, Dodds L, Westbrook J. Systematic review of 29 self-report instruments for assessing quality of life in older adults receiving aged care services. BMJ Open 2021;11(11):e050892.

26. Gallardo-Peralta LP, Sánchez-Moreno E, Rodríguez-Rodríguez V. Quality of life in indigenous and non-indigenous older persons in the North of Chile. Interciencia 2018;43(5):313-6.

27. Krishnappa L, Gadicherla S, Chidambaram P, Murthy NS. Quality of life (QOL) among older persons in an urban and rural area of Bangalore, South India. J Family Med Prim Care 2021;10(1):272-7.

28. Rajput M, Pinki, Shiba, Kumar S, Ranjan R. Determinants of quality of life of geriatric population in rural block of Haryana. J Family Med Prim Care 2022;11(9):5103-9.

29. Haugan G, Drageset J, André B, Kukulu K, Mugisha J, Utvær BKS. Assessing quality of life in older adults: Psychometric properties of the OPQoL-brief questionnaire in a nursing home population. Health Qual Life Outcomes 2020;18(1):1.

30. Bilotta C, Bowling A, Nicolini P, Casè A, Pina G, Rossi SV, et al. Older People's Quality of Life (OPQOL) scores and adverse health outcomes at a one-year follow-up. A prospective cohort study on older outpatients living in the community in Italy. Health Qual Life Outcomes 2011;9:72.