# Predictors of quality of life among geriatric population in a tribal dominant state of India: A community based analytical study

**Santosh Kumar Soren[1], Anju Prabha Kumari[2], Anit Kujur[3], Shalini Sunderam[4], Shashi Bhushan Singh[5], Mayank Raj[2]**

*[1]Tutor, [2]Junior Resident Academic, [3]Assistant Professor, [4]Professor, [5]Associate Professor, Department of Preventive and Social Medicine, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India*

## ABSTRACT

**Background:** Improving the quality of life of the geriatric population along with maintaining their health and promoting social participation still poses a major public health challenge in the twenty-first century. Hence, we planned to measure the quality of life (QOL) in each domain namely physical, psychological, social, and environmental using the world health organization quality of life **brief** version (WHO QOL-BREF) questionnaire and to assess the predictors of QOL among the elderly population. **Methodology:** A community-based cross-sectional study was conducted in Ormanjhi, Ranchi, Jharkhand for a period of 6 months. The study was carried out among 206 geriatric populations fulfilling the eligibility criteria. The data collected were entered in MS Excel and analyzed using SPSS version 20. The QOL scores were expressed in terms of mean and standard deviation, and the difference between mean scores was tested by using student t-test/analysis of variance (ANOVA). The predictor associated with QOL was done by multiple linear regression analysis. *P* value less than 0.05 was considered statistically significant. **Results:** A total of 206 geriatric people fulfilling the study criteria were enrolled during the study. The majority of the people were of the age between 60 and69 years (71.8%). Most of them 202 (98.1%) resided in rural areas, 108 (52.4%) of them were illiterate by education, and nearly half 102 (49.5%) depended on pension for livelihood. Nontribal ethnicity, backward category, illiteracy, low socio-economic status, nuclear family, elderly person having no own source of income, currently living alone, person having more co-morbidity, and less activities of daily living (ADL) score were significantly associated with low QOL score. **Conclusion:** Overall QOL was good to excellent in Ranchi, Jharkhand. We concluded that QOL is affected by many different factors.

**Keywords:** Cluster sampling, community, geriatrics, quality of life, WHO QOL-BREF

## Introduction

The elderly people are afflicted and burdened by the process of aging that causes a general decline in their health. In the words of Seneca "Old age is an incurable disease." It is rightly said by Sir James sterling Ross "You do not heal old age, you protect it, you promote it and you extend it."[1] Aging includes an increased risk of disease, disability, decreased functional capacity, and eventually death. It affects every individual, family, community, and society.[2] Globally, the geriatric population has increased from 8% in 2012 to 8.5% in 2015. It is expected to rise by 22% in 2050. In the year 2015, there were an estimated 617 million old persons in the world, of which 400 million were living in low-income countries.[3] According to a survey done in 2011, the geriatric population in India has increased to 8.2 percent.[4] As per the statement reported by the Technical Group on Population estimates for India and

**Address for correspondence:** Dr. Shalini Sunderam, Professor, Department of Preventive and Social Medicine, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India. E-mail: skspmch@gmail.com

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States 2011–2036, a rise of nearly 34 million elderly persons was seen inthe year 2021 over the Population Census conducted in 2011 and is further anticipated to increase by around 56 million of elderly persons in 2031.[5] According to Population Census 2011, there are nearly 104 million elderly persons in India of which 53 million are female, and 51 million are male.[3] In Jharkhand, there are nearly 2,357 thousand (7.1%) elderly persons; 1175 thousand females, and 1182 thousand males. As regards rural and urban areas, 1833 thousand persons reside in rural areas, whereas 524,000 persons are in urban areas.

Improving the quality of life of the geriatric population along with maintaining their health and promoting social participation still poses a major public health challenge in the twenty-first century. Quality of life (QOL) is defined by WHO as: "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."[6] WHO QOL-100 was the first instrument developed by the WHO to measure the quality of life of individuals.[7] Later, the instrument was revised and the World Health Organization Quality of Life **Brief** Version (WHO QOL-BREF) instrument was developed to measure QOL.[8] According to recent studies, this instrument is reliable, valid, and culturally appropriate for self-reporting of health-related QOL in the Indian elderly. Predictors of QOL are important for primary care physicians to know better about the burden of preventable disease, injuries, and disabilities among the geriatric population. These predictors will help primary care physicians to improve the medical condition and quality of life among the geriatric population. Till now, no related study on Quality of life among the geriatric population has been done in rural setting in the tribal-dominant State like Jharkhand.So, our objective of the present study was to measure QOL in each domain namely physical, psychological, social, and environmental using the WHO QOL-BREF questionnaire (26 items) and to assess the predictors of QOL among the elderly population.

## Methodology

This was a community-based analytical cross-sectional study which was conducted in the rural field practice area, Ormanjhi under the Department of Preventive and Social Medicine (PSM), Rajendra Institute of Medical Sciences (RIMS), Ranchi.

Cluster sampling method was chosen for this study. The total population of three health sub center areas namely Irba, Anandi, and Chakla of Ormanjhi block of Ranchi is about 17,726 comprising 7758, 5977, and 3991 in Irba, Anandi, Chakla, respectively, and the geriatric population (≥60 years age) is about 1000 which form the reference population. There were 21 villages in the selected area. One village was considered as one cluster. Seven (7) of them were chosen randomly by the lottery method. The selected villages were Pahantoli, Karma, Upper Chakla, Lower Chakla, Sarnatoli, Thakurtoli, and Jhiri. From each village, 32 subjects were taken for study. For this, each house in the selected village was assigned a number. One

number was chosen randomly by the lottery method to select the first house. Then, the subsequent houses were visited to collect data from subjects until a sample size of 32 was achieved in that village. In this way, a total of 220 subjects were included in the present study. All willing eligible subjects from a household were enrolled for the study. In case if any house had more than one elderly, then all were considered in our study.

### Calculation of sample size

As there is no baseline data available on the quality of life of geriatric people in Jharkhand, so the assumption was made on the basis of findings of a study conducted by Ganesh SK, Majumdar A, and Pavithra G in Puducherry, India which revealed that the standard deviation of the overall QOL score in the elderly population was 10.[9]

Thus, taking standard deviation (SD) as 10 and precision of study (D) as 2%, the sample size was calculated using the formula:

Sample size = 4*SD*SD/D*D

It came out to be 100. Because cluster sampling was done, so upon applying the design effect of 2, the sample size came out to be (2*100 = 200). Assuming a nonresponse rate to be 10%, 220 individuals were recruited for the study. Ten participants did not give informed consent, and the data was incomplete for the four participants, so the final sample size was 206 upon which analysis was done.

Geriatric people of ages 60 years or above of both sex were interviewed in the field practice areas of the Department of PSM, RIMS, Ranchi over a period of 6 months from March to August 2018. All the participants fulfilling eligibility criteria and willing to participate were included in the study and acutely ill, bedridden, mentally unsound patients, and those not giving their consent were excluded from the study. A pretested semi-structured questionnaire was used for data collection which included parts covering socio-demographic profiles and for measuring the quality of life, WHOQOL-BREF questionnaire was used.

### Study tool

(1) **WHOQOL-BREF**[6] was used to assess the quality of life. It took into consideration 26 items and covered four domains of quality of life i.e., physical (Seven items), psychological (Six items), social (Three items), and environmental (Eight items). Two items about general health were also asked. Each item of the WHOQOL-BREF questionnaire was scored from 1 to 5 on a response scale and then transformed to a 0–100 scale. The physical domain covered pain, energy, sleep, and daily activities. The psychological domain measured positive and negative feelings, ways of thinking, self-esteem, and body image. The social domain covered questions about personal relationships and social support. The environmental domain contained questions about financial status, safety, home environment, and transportation. The instrument

reliability was measured using Cronbach's alpha. The overall reliability for all questions on the WHOQOL-BREF was 0.94. For the physical health, social relationship, environmental, and psychological well-being domains, the reliabilities were 0.94, 0.79, 0.88, and 0.84, respectively.

The overall quality of life was calculated by adding the score of items from 1 to 26. The four grading of QOL depending upon the score was interpreted as follows [Table 1]-

### Table 1: Grading for Quality of life according to Score

| Score | Grade |
| --- | --- |
| 22-44 | Poor |
| 45-66 | Fair |
| 67-88 | Good |
| 89-130 | Excellent |

WHOQOL-BREF has provided a readymade table for converting raw score to transformed score in scale of 4–20 and 0–100 both. We used a scale of 0–100 directly from the provided table to convert raw score to transformed score, and analysis was based on transformed score.

(2) **Activities of Daily Living (ADL):** ADL was assessed by using the Katz ADL Scale which contained six questions on various aspects of daily activities.* The score ranged from 0 to 6, where "6" was the highest score with independence on ADL, and "0" was the lowest score with highly dependent on ADL.

## Statistical analysis

The data were entered, and the template was generated in MS Excel, and analysis was done on SPSS version 20.0. Our primary analysis involved the calculation of frequencies and proportion of the study variables for the whole population. Independent sample t-test or ANOVA was applied to see the significant difference of various domains of quality of life in different groups of subjects. Multiple linear regression analysis was done to know the influences of various associated factors determining the final score of quality of life. A *P* value of <0.05 was set to be significant and also their 95% confidence interval was reported in our present study.

## Results

A total of 206 participants were included in our study. The number of people belonging to the age-group of 60–69 years was 148 (71.8%), whereas among the participants, males were more [109 (52.9%)] than females [97 (47.1%)]. The majority [90 (61%)] of the study participants were Hindu by religion, of nontribal ethnicity [134 (65%)], from the rural area [202 (98.1%)], and nearly half [105 (51%)] of them belonged to Brahma Govind Prasad class 4 socioeconomic status. Educational status of the study population showed that 108 (52.4%) were illiterate, followed by middle school[88 (42.7%)], 8 (3.9%) had attained secondary, and only 2 (1%) had educated higher secondary and above. The majority [134 (65%)] were married, and most 192 (93.2%) of them belonged to joint families. In our study, the source of livelihood for nearly

half [102 (49.5%)] of the elderly was pension followed by farming [14 (6.8%)] then business [6 (2.9%)], and 84 (40.8%) had no own source of income. According to our study, nearly half [101 (49%)] of the elderly were taken care by their children, and the majority [137 (66.5%)] of the elderly lived with their spouse and children [Table 2].

### Table 2: Socio-demographic profile of study participants (*n*=206)

| Characteristics | Category | Frequency | Percentage |
| --- | --- | --- | --- |
| Age | 60-69 years | 148 | 71.8% |
| | 70-79 years | 42 | 20.4% |
| | ≥80 years | 16 | 7.8% |
| Gender | Males | 109 | 52.9% |
| | Females | 97 | 47.1% |
| Religion | Hindu | 90 | 61% |
| | Muslim | 52 | 25.2% |
| | Christian | 08 | 3.9% |
| | Sarna# | 56 | 27.2% |
| Ethnicity | Tribal | 72 | 35% |
| | Nontribal | 134 | 65% |
| Category | General | 16 | 7.8% |
| | OBC | 104 | 50.5% |
| | SC | 14 | 6.8% |
| | ST | 72 | 35% |
| Residence | Urban | 4 | 1.9% |
| | Rural | 202 | 98.1% |
| Education | Illiterate | 108 | 52.4% |
| | Middle | 88 | 42.7% |
| | Secondary | 8 | 3.9% |
| | Higher sec and above | 2 | 1% |
| Past Occupation | Gov. employee | 23 | 11.2% |
| | Private sector | 11 | 5.3% |
| | Farming | 53 | 25.7% |
| | Business | 36 | 17.5% |
| | Daily wage worker | 22 | 10.7% |
| | Homemaker | 52 | 25.2% |
| | Unemployed | 9 | 4.4% |
| Socioeconomic status* | Class 1 | 4 | 1.9% |
| | Class 2 | 22 | 10.7% |
| | Class 3 | 43 | 20.9% |
| | Class 4 | 105 | 51% |
| | Class 5 | 32 | 15.5% |
| Family type | Nuclear | 14 | 6.8% |
| | Joint | 192 | 93.2% |
| Marital status | Married | 134 | 65% |
| | Widow/Widower | 72 | 35% |
| Food habit | Vegetarian | 8 | 3.9% |
| | Non vegetarian | 96 | 95.1% |
| | Occasional nonvegetarian | 2 | 1% |
| Source of livelihood | Pension | 102 | 49.5% |
| | Business | 6 | 2.9% |
| | Farming | 14 | 6.8% |
| | No own source of income | 84 | 40.8% |
| Caretaker | Self | 43 | 20.9% |
| | Spouse | 62 | 30.1% |
| | Son or daughter | 101 | 49% |
| Current living status | With Spouse and Children | 137 | 66.5% |
| | With Spouse | 11 | 5.3% |
| | With Children | 49 | 23.8% |
| | Living alone | 9 | 4.4% |

#local religion of Jharkhand. *As per Modified B.G. Prasad Classification 2020

The majority of the study participants [124 (60.2%)] had a good quality of life followed by 48 (23.3%) who had fair QOL, and 34 (16.5%) had excellent QOL score [Table 3].

The mean (SD) transformed score of physical, psychological, social, and environmental domain was found to be 52.09 (± 19.583), 51.28 (± 13.753), 58.23 (± 21.216), and 46.42 (± 14.101), respectively [Table 4].

Among the socio-demographic variables, age was significantly associated with physical, psychological, and social domain score of QOL ($P < 0.001$) [Table 5]. The trend was observed that as the age advanced, the QOL score was decreased.

Higher caste was significantly associated with a better physical, psychological, and a social domain score of QOL ($P < 0.001$) [Table 5].

There was a statistically significant association between nontribal and tribal subjects regarding their ethnicity and physical and social dimensions of quality of life ($P < 0.01$) [Table 5].

There was a better physical, psychological, and social domain score of QOL in those subjects whose education level was higher secondary and above ($P < 0.001$) [Table 5].

The study subjects who were in government service in the past had better physical, psychological, social, and environmental domain scores of QOL as compared to others ($P < 0.001$) [Table 5].

The study subjects who belonged to socioeconomic class I and II had a better psychological, social, and environmental domain score of QOL as compared to those who belonged to Class III, IV, and V ($P < 0.001$) [Table 5].

The study subjects who had not any source of income had lesser physical, psychological, social domain scores of QOL as compared to others who had any source of the mode of wages ($P < 0.01$) [Table 5].

The study subjects who lived with spouses and children, belonged to joint families, lived in rural areas, and married elderly had better physical, psychological, social, and environmental domains of QOL ($P < 0.05$) [Table 5].

The physical, psychological, social, and environmental domain score of QOL was found to be better in those with normal activities of daily living (ADL) and having no co-morbidity, and it was also found to be statistically highly significant on applying the "Student t-test" ($P < 0.001$) [Table 5].

The multiple linear regression model was used for the determination of predictors of overall quality of life. It was revealed that nontribal ethnicity, backward category, illiteracy, low socio-economic status, nuclear family, an elderly person having no own source of income, no physical activity, a person having more co-morbidity, and less activities of daily living (ADL) score were significantly associated with low QOL score. However, age, gender, past occupational status, current living status, marital status, residence, and outdoor leisure activity was not found statistically significant [Table 6].

## Discussion

The present study showed mean transformed score of physical, psychological, social, and environmental domain was found to be 52.09 (± 19.583), 51.28 (± 13.753), 58.23 (± 21.216), and 46.42 (± 14.101), respectively [Table 3]. A study done by Joseph *et al.*[10] found that higher mean WHOQOL-BREF scores of physical health, psychological health, social relationships, and environment domain were found probably due to greater prevalence of morbidities that inversely affected QOL.

The present research revealed that that the social domain of quality of life had the highest mean score of 58.23 (± 21.216) in this study, whereas the environmental domain had the lowest mean score 46.42 (± 14.101). The majority (60.2%) of elderly had good quality of life whereas 23.3% had fair QOL and 34 (16.5%) had excellent QOL score [Table 2] and it is classified on the basis of [Table 1]. It was observed to be higher in subjects who were educated and married, belonged to nonscheduled caste, and lived in joint families. Similar findings were observed by the WHOQOL-OLD project[11] which found males, married people, and those with a higher level of education presented with a better quality of life. Moreover, scores of psychological health, environment, and social relationships domain were significantly better among class I and class II as compared to poor socioeconomic groups which were quite akin to the observations seen in a study done in Iran where financial insecurity was found to adversely affect QOL.[12] The inference that can be hence drawn from the above findings suggests the need for financial security schemes to be provided by the government in order to improve the Quality of Life of the elderly.

### Table 3: Distribution of the study subjects on the basis of Overall Quality of Life Grading (*n*=206)

| QOL Grade | Frequency | Percentage |
|---|---|---|
| Poor (22-44) | 00 | 00 |
| Fair (45-66) | 48 | 23.3 |
| Good (67-88) | 124 | 60.2 |
| Excellent (>89) | 34 | 16.5 |
| Total | 206 | 100 |

### Table 4: Domain wise transformed score of Quality of Life (*n*=206)

| QOL Domain | Mean transformed score of QOL | Standard Deviation |
|---|---|---|
| Physical Domain | 52.09 | 19.583 |
| Psychological Domain | 51.28 | 13.753 |
| Social Domain | 58.23 | 21.216 |
| Environmental Domain | 46.42 | 14.101 |

**Table 5: Association of Quality of Life with socio-demographic variables among the respondents (*n*=206)**

| Variables | Freq (*n*) | QOL domain (mean score±S.D) | | | |
|---|---|---|---|---|---|
| | | **Physical** | **Psychological** | **Social** | **Environmental** |
| Age group | | | | | |
| 60-69 | 148 | 55.99±18.323 | 52.22±12.105 | 60.97±20.542 | 45.95±12.708 |
| 70-79 | 42 | 48.90±16.759 | 54.95±15.649 | 55.86±21.875 | 48.95±18.057 |
| ≥80 | 16 | 24.38±13.613 | 32.88±8.476 | 39.13±15.156 | 44.13±14.764 |
| *F* | | 23.861 | 19.014 | 8.570 | 0.973 |
| *P* | | 0.000 | 0.000 | 0.000 | 0.380 |
| Gender | | | | | |
| Male | 109 | 54.15±19.285 | 51.74±13.124 | 58.33±23.174 | 45.56±14.847 |
| Female | 97 | 49.77±19.754 | 50.75±14.479 | 58.11±18.895 | 47.38±13.224 |
| *t* | | 1.606 | 0.515 | 0.073 | -0.925 |
| *P* | | 0.110 | 0.607 | 0.942 | 0.356 |
| Category | | | | | |
| General | 16 | 57.75±11.463 | 64.69±12.186 | 61.06±13.645 | 53.25±14.093 |
| OBC | 104 | 46.63±18.005 | 49.65±14.766 | 55.19±20.327 | 46.83±14.632 |
| SC | 14 | 47.71±22.179 | 54.57±14.053 | 46.43±14.685 | 43.14±13.570 |
| ST | 72 | 59.56±20.198 | 50.00±10.684 | 64.28±23.271 | 44.94±13.145 |
| *F* | | 7.511 | 6.515 | 4.409 | 1.816 |
| *P* | | 0.000 | 0.000 | 0.005 | 0.145 |
| Education | | | | | |
| Illiterate | 108 | 52.31±20.246 | 49.70±12.324 | 55.81±22.283 | 42.78±12.845 |
| Primary | 88 | 51.77±19.360 | 49.52±11.388 | 58.70±19.391 | 47.41±11.663 |
| Secondary | 08 | 46.75±11.042 | 82.75±3.240 | 76.63±8.618 | 74.25±3.845 |
| Higher Sec and above | 02 | 75.00±0.000 | 87.50±9.192 | 94.00±0.000 | 88.00±0.000 |
| *F* | | 1.125 | 26.959 | 4.612 | 25.423 |
| *P* | | 0.340 | 0.000 | 0.004 | 0.000 |
| Occupation | | | | | |
| Gov. Ser | 23 | 56.30±19.999 | 61.91±16.167 | 73.61±20.745 | 59.22±17.858 |
| Private | 11 | 44.45±13.685 | 44.91±11.256 | 51.27±21.777 | 41.18±10.381 |
| Farming | 53 | 49.13±20.363 | 47.40±11.672 | 53.96±20.509 | 44.00±10.944 |
| Business | 36 | 52.17±18.879 | 53.50±15.520 | 56.28±17.007 | 47.36±14.149 |
| Daily wages | 22 | 63.00±17.685 | 52.27±10.058 | 71.09±20.887 | 46.91±14.485 |
| Homemaker | 52 | 54.96±17.251 | 52.50±12.266 | 55.52±21.194 | 43.50±12.805 |
| Unemployed | 09 | 24.44±9.475 | 36.33±6.265 | 44.56±12.370 | 46.22±15.031 |
| *F* | | 5.648 | 6.232 | 5.331 | 4.489 |
| *P* | | 0.000 | 0.000 | 0.000 | 0.000 |
| Socio-economic status | | | | | |
| Class 1 | 04 | 72.00±3.464 | 71.75±18.945 | 97.00±3.464 | 84.50±4.041 |
| Class 2 | 22 | 55.18±14.611 | 55.09±11.079 | 66.18±23.256 | 52.55±16.014 |
| Class 3 | 43 | 50.79±16.025 | 55.56±13.231 | 62.37±16.225 | 46.40±12.559 |
| Class 4 | 105 | 50.16±20.577 | 48.42±13.240 | 52.11±19.415 | 42.98±11.147 |
| Class 5 | 32 | 55.53±23.166 | 49.72±13.700 | 62.41±24.096 | 48.75±15.803 |
| *F* | | 1.745 | 5.332 | 7.966 | 12.349 |
| *P* | | 0.142 | 0.000 | 0.000 | 0.000 |
| Current source of income | | | | | |
| Pension | 102 | 47.36±17.351 | 49.88±14.023 | 56.28±22.272 | 46.65±15.305 |
| Business | 06 | 69.00±11.296 | 67.83±8.256 | 65.67±15.858 | 61.50±13.620 |
| Farming | 14 | 67.86±13.271 | 58.00±5.897 | 67.43±18.020 | 47.14±9.922 |
| Dependent on Son | 46 | 59.65±18.355 | 52.91±12.064 | 59.13±20.433 | 44.83±11.708 |
| No income source | 38 | 47.13±22.708 | 47.95±15.205 | 57.79±20.773 | 45.08±13.917 |
| *F* | | 8.210 | 4.244 | 1.083 | 2.002 |
| *P* | | 0.000 | 0.003 | 0.366 | 0.096 |
| Current living status | | | | | |
| Spouse & Children | 137 | 51.56±19.332 | 51.60±12.056 | 61.88±18.310 | 47.23±13.458 |
| Spouse only | 11 | 51.91±15.372 | 46.18±13.235 | 41.64±29.877 | 42.82±15.696 |
| Children only | 49 | 57.37±18.809 | 53.78±16.719 | 55.94±23.429 | 47.29±15.185 |

*Contd...*

| Variables | Freq (*n*) | QOL domain (mean score±S.D) | | | |
| --- | --- | --- | --- | --- | --- |
| | | **Physical** | **Psychological** | **Social** | **Environmental** |
| Living alone | 09 | 31.56±20.131 | 39.00±15.330 | 35.44±14.258 | 33.67±10.404 |
| *F* | | 4.768 | 3.589 | 7.982 | 2.991 |
| *P* | | 0.003 | 0.015 | 0.000 | 0.032 |
| Type of Family | | | | | |
| Nuclear | 14 | 52.86±15.985 | 47.43±11.947 | 47.43±29.886 | 44.00±15.630 |
| Joint | 192 | 52.03±19.853 | 51.56±13.862 | 59.02±20.327 | 46.59±14.012 |
| *t* | | 0.152 | -1.085 | -1.987 | -0.664 |
| *P* | | 0.879 | 0.279 | 0.048 | 0.508 |
| Marital Status | | | | | |
| Married | 134 | 52.58±19.294 | 51.78±12.390 | 60.52±20.046 | 46.69±13.924 |
| Widow/Widower | 72 | 51.17±20.214 | 50.35±16.039 | 53.96±22.772 | 45.92±14.511 |
| *t* | | 0.494 | 0.710 | 2.136 | 0.373 |
| *P* | | 0.622 | 0.478 | 0.034 | 0.710 |
| Ethnicity | | | | | |
| Tribal | 72 | 59.56±20.198 | 50.00±10.684 | 64.28±23.271 | 44.94±13.145 |
| Nontribal | 134 | 48.07±18.079 | 51.96±15.142 | 54.98±19.346 | 47.21±14.576 |
| *t* | | 4.170 | -0.977 | 3.060 | -1.100 |
| *P* | | 0.000 | 0.330 | 0.003 | 0.273 |
| Residence | | | | | |
| Rural | 202 | 51.69±19.567 | 50.87±13.381 | 57.46±20.698 | 45.66±13.158 |
| Urban | 04 | 72.00±3.464 | 71.75±18.945 | 97.00±3.464 | 84.50±4.041 |
| *t* | | -2.070 | -3.068 | -3.811 | -5.885 |
| *P* | | 0.040 | 0.002 | 0.000 | 0.000 |
| ADL | | | | | |
| Normal | 167 | 57.60±16.799 | 53.65±12.122 | 61.12±20.394 | 47.56±13.405 |
| Impaired | 39 | 28.49±11.438 | 41.10±15.731 | 45.85±20.432 | 41.54±16.049 |
| *t* | | 10.271 | 5.482 | 4.210 | 2.428 |
| *P* | | 0.000 | 0.000 | 0.000 | 0.016 |
| Morbidity | | | | | |
| Present | 150 | 43.07±14.151 | 47.59±13.032 | 50.96±18.377 | 43.76±12.196 |
| Absent | 56 | 76.23±8.464 | 61.14±10.431 | 77.70±15.260 | 53.54±16.351 |
| *t* | | -16.455 | -6.986 | -9.705 | -4.644 |
| *P* | | 0.000 | 0.000 | 0.000 | 0.000 |

**Table 5: Contd...**

## Predictors of QOL

No significant gender-related differences were found in QOL scores in our study. A study at Vidyanagar, Karnataka, by Lokare *et al.*[13] showed that mean scores of males and females differed significantly in the physical domain, but in other domains, there was no significant difference between genders. In contrast, study by Sivapragasam *et al.*[14] showed male gender had a better QOL score in the physical domain when compared to females. A study by Qadri *et al.*[15] also revealed that different gender had significantly different scores QOL scores. Keralan researchers concluded that the majority of females in their study had lower educational qualifications and were unemployed with no income; their poor mental health status may be due to financial and health-seeking dependency on their children or other family members.[16]

A study using WHOQOL-BREF questionnaire in Karnataka noted that different age groups were significantly affected the physical, psychological, and social domains of QOL, and marital status affected social and environmental domains.[17] Researchers working worldwide with the elderly population amicably agree in their opinion that in the natural history of aging, the human population experiences a gradual decline in almost all body functions which are due to anatomical, physiological as well as biochemical changes causing dependency and consequently resulting in reduced QOL.[18-20] A study by Sowmiya *et al.*[21] showed that the mean QOL scores decreased with increasing age In the present study, a statistically significant difference was found between different age groups with physical, psychological, and social domains of QOL and also observed the trend that as the age advanced, the QOL was decreased.

In the present study, education had influenced only the physical domain scores, whereas a study by Sowmiya *et al.*[21] showed that literate elderly had better mean QOL domain scores than the illiterates. Education levels that increased self-esteem were found to be significantly associated with QOL in the Myanmar study.[22] A study by Ghosh *et al.*[23] also reported that low education, being single, lacking personal income, and not living with their children significantly reduced QOL in the elderly subjects.

| Table 6: Multiple Linear Regression Analysis of Quality of Life (QOL) total Score | | | | |
|---|---|---|---|---|
| Variables | Category | Standardized Beta coefficient | 95% CI | *P* |
| Age in years | <70 years | Ref | Ref | |
| | >70 years | -0.066 | -3.786-0.563 | 0.145 |
| Ethnicity | Tribal | Ref | Ref | |
| | Nontribal | -0.365 | -18.708 - (-4.592) | 0.001 |
| Category | General | Ref | Ref | |
| | Backward | -0.416 | (-9.430)-(-2.802) | 0.000 |
| Residence | Urban | Ref | Ref | |
| | Rural | -0.001 | -10.186-10.072 | 0.991 |
| Education | Illiterate | Ref | Ref | |
| | Literate | 0.218 | 2.936-7.733 | 0.000 |
| Occupation | Employed | Ref | Ref | |
| | Unemployed | 0.023 | -0.638- (1.052) | 0.630 |
| Socioeconomic status | Upper class | Ref | Ref | |
| | Lower class | -0.107 | -3.290- (-.237) | 0.024 |
| Marital status | Married | Ref | Ref | |
| | Widow | -0.029 | (-5.377) - (-3.500) | 0.677 |
| Type of Family | Nuclear | Ref | Ref | |
| | Joint | 0.122 | (2.118) - (12.680) | 0.006 |
| Own source of Income | Yes | Ref | Ref | |
| | No | -0.016 | (-2.916) - (2.042) | 0.014 |
| Current living status | With family | Ref | Ref | |
| | Alone | -0.064 | (-3.128) - (1.152) | 0.364 |
| Physical activities | Yes | Ref | Ref | |
| | No | -0.404 | -20.428- (-8.638) | 0.000 |
| Morbidity | Yes | Ref | Ref | |
| | No | 0.600 | (17.098) - 23.960 | 0.000 |
| Activity of daily living | Normal | Ref | Ref | |
| | Impaired | 0.172 | (0.203) - (13.184) | 0.043 |

$R^2$=0.725, Standard Error=8.302

In our study, a highly significant difference in physical and psychological domain of QOL was found between the employed and unemployed study participants. A study by Qadri *et al.*[15] also reported similar findings.

The current source of income and high socioeconomic status is found to be significantly associated with financial satisfaction. According to a study by Gupta *et al.* (2014)[24] using WHOQOL Old Age Home - BREF Scale the important reason for elderly people living in public Old Age Home was poverty (20.0%). A study by Ghosh *et al.* (2014)[23] also reported similar findings. A major section of literature from India and other developing countries in South-east Asia showed similar findings with minor differences in certain parameters.[17,8] They might be just incidental findings or may be due to differences in the instruments, sample size, and techniques.

In the present study, statistically significant higher mean score relationship was noted in all four domains of QOL amongst our participants who were dwelling with their children when compared to subjects who lived alone. A study by Ghosh *et al.*[23] also reported that being single and not living with their children significantly reduced QOL in the elderly subjects.

In the present study, marital status showed significant association with the scores of all four domains. A study by Qadri *et al.*[15] also concluded that marital status had a significant impact on QOL in their study. Barua A *et al.*[17] also observed in their study on the geriatric population that currently married had a better quality of life than those who were divorced, widowed, or separated.

The physical, psychological, social, and environmental domain scores of QOL of those subjects who performed physical activities were found to be better and calculated as 59.34 (± 15.501), 54.80 (± 11.380), 62.19 (± 20.320), and 47.84 (± 13.445), respectively. [Table 5] Similar findings were seen by Qadri *et al.*[15] in their study in north India.

The physical, psychological, social, and environmental domain score of QOL in persons with morbidity was found to be 43.07 (± 14.151), 47.59 (± 13.032), 50.96 (± 18.377), and 43.76 (± 12.196), respectively, whereas it was 76.23, 61.14, 77.70, and 53.54, respectively in participants with no co-morbidity. [Table 5] A similar study by Ghosh *et al.*[23] also reported the same findings. These morbidity Scores will definitely help the family physician to determine the morbidity pattern and to further prevent future disabilities among them which will ultimately help in the improvement of Quality of Life among the geriatric population.

Linear regression showed that nontribal ethnicity, backward category, illiteracy, low socio-economic status, nuclear family, elderly person having no own source of income, no physical activity, having more co-morbidity, and less activities of daily living (ADL) scores were significantly associated with low QOL score. However, age, gender, past occupational status, current living status, marital status, residence, and outdoor leisure activity were not found statistically significant. Contradictory to the study done by Devraj S *et al.*[25] where determinants like age, gender, elderly who were on medication, and ill-treated elders were found to be statistically significant. This may be due to differences in the urban and rural settings [Table 6].

## Study limitation

The study has methodological limitations that should be considered. We have conducted cross-sectional study for data collection, so a clear temporal association between the study factors and quality of life cannot be established.

## Conclusion

Our study suggests that overall QOL was good to excellent, but the environmental domain was not up to the mark which could be improved by collective efforts from family as well as by a network of geriatric support groups. Positive outcome in the QOL could be achieved if family support, financial support, and level of education are improved in the community. Nontribal ethnicity, backward category, Illiteracy, low socio-economic status, nuclear family, the elderly person having no own source of income, currently living alone, person having more co-morbidity, and less

activities of daily living (ADL) score were significantly associated with low QOL score. It is a joint responsibility of health care providers, primary care physicians, program managers, and family caregivers to deal with these predictors and understand their effect on QOL.

## Ethical approval

The study was approved by Institutional Ethics Committee.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

## Conflicts of interest

There are no conflicts of interest.

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