Quality of life (QOL) among older persons in an urban and rural area of Bangalore, South India

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Introduction

Ageing population is a global phenomenon due to increasing survival and life expectancy. India has the second largest population of older persons in the world and the proportion of older persons is projected to increase from 8% in 2015 to 19% by 2050. The longer life expectancies have not necessarily translated to healthy ageing and the older population is plagued by unique challenges in accessing health care. The health resources in India and access to it are also inequitably distributed and more urban biased making rural older persons face greater restrictions in access to health care. The changing social structure and existing health systems perpetuate the challenges faced by older persons and may adversely affect their quality of life (QOL).

QOL is an individual's perceptions of their life position in context of the society and culture they live in. QOL of older persons should not decline simply because of ageing. A good QOL could mean that the older population is ageing healthily and positively. It could mean that the older persons perceive a low risk of disease and disability, high mental and physical function and active engagement with life. Hence, it is important to study the QOL and the factors that affect QOL among older persons in urban and rural areas. Hence, this study was undertaken with the objective of assessing the QOL among older persons in an urban and rural area of Bangalore.

Materials and Methods

Cross-sectional study was done among 977 older persons 60 years and above. Census enumeration blocks in urban areas and villages in rural areas were randomly selected and all older persons meeting the inclusion criteria were administered the WHOQOL-Bref questionnaire.

Results

Mean QOL scores (SD) in the physical, psychological, social relationship and environmental domains were 50.5 (5.5), 49.2 (5.5), 49.4 (6.5) and 49.3 (5.1) in rural areas and 57.4 (8.9), 58.6 (8.8), 64.6 (10.8) and 60.0 (9.4) in urban areas, respectively. Compared to urban, rural older persons uniformly have lower QOL irrespective of sex, education or financial dependence.

Conclusion

Inequitable health resource distribution and inadequate social support systems must be addressed to improve the QOL of older persons, especially in rural areas. Primary care providing essential services can bridge this urban-rural divide and improve QOL of older persons.

Keywords: Ageing, elderly, older adults, WHOQOL-Bref
Materials and Methods

The study was a cross-sectional study conducted in urban and rural field practice areas of a tertiary medical college hospital in 2017. The study was part of a larger study assessing disabilities among older persons in urban and rural Bangalore. The rural part of the study was conducted at Aradeshnahalli Primary Health Centre area of rural Bangalore with a population of approximately 11,000 in 19 villages. The urban area was Mathikere health centre area of urban Bangalore consisting of 89,000 population in 120 census enumeration blocks (CEBs). The study included all older persons 60 years and above residing for a minimum of 6 months in the study area and excluded those who were not willing to be examined or those not present in their homes even after three home visits.

The original study of which this study is a part had a minimum sample size of 963 older persons from 6500 urban and 6500 rural population. In a study by Usha and Lalitha conducted at Kottayam, South India, it was found that the mean QOL scores among study participants in rural area were 12.21 (1.88) and in urban area were 13.09 (1.65). In the present study, considering a mean difference of 0.4 in QOL, power of 80% and α error of 1%, the minimum sample size was calculated to be 458 in each area. The minimum sample size needed for this study was met in the original study. Based on older persons' proportion of 8% as per SRS 2011, it was necessary to cover 5,725 population in rural and urban areas to reach 916 older persons. To cover the required population in Mathikere and Aradeshnahalli, 9 CEBs and 11 villages were randomly selected, respectively, and covered entirely. The final number of older persons covered in the house-to-house survey was 977 [Figure 1].

Ethical clearance was obtained from MS Ramaiah Medical College Ethics Committee (ECR/215/Inst/Ker/2013 dated 12.09.2015). A training manual was developed which explained the operational aspects of the study. Medicsocial workers (MSW) were trained with the help of the manual and for collection of data from the field and posted in ophthalmology, ENT and orthopaedics outpatient departments to train under specialists for clinical examination. House-to-house survey was conducted and all older persons who met the inclusion criteria were included in the study. Following written informed consent of the older persons, a semistructured questionnaire was administered to collect demographic details and WHOQOL-Bref with 26 questions in 4 domains to collect details on QOL. Older persons were examined for locomotor, visual, hearing, speech and mental disabilities. Older persons diagnosed with disability were referred to the tertiary medical college hospital or nearest health centre for services.

Statistical analysis

Data were entered in an MS Excel sheet and analysed using SPSS v18. QOL was calculated in four domains—physical, psychological, social relationships and environmental domain based on the WHO scoring system. The scores have been represented as mean and standard deviation (SD). Data were checked for normality using Kolmogorov–Smirnov test and since the QOL scores were not normally distributed, Mann–Whitney U test has been used to test for significance in median score. P value of 0.05 has been considered for statistical significance. The median scores in each domain were also calculated and median score was used as cut-off score to classify good and poor QOL. Univariate analysis and forward logistic regression were done to find the determinants of QOL in rural and urban areas.

Results

Among the 977 older persons, 540 (55.2%) were females. The age distribution was significantly different with 322 (65.1%) in the 60–69 and 37 (7.5%) in the ≥80 years age group in urban areas compared to 245 (50.8%) and 37 (18.5%) in rural areas. Twenty-seven per cent (130) of rural older persons were currently employed in rural areas compared to 17.8% (88) in urban areas. However, 8.9% (43) older persons in rural areas were independent financially compared to 18.4% (91) in urban older persons [Table 1].

The mean QOL scores (SD) in the physical, psychological, social relationship and environmental domains were 50.5 (5.5), 49.2 (5.5), 49.4 (6.5) and 49.3 (5.1) in rural areas and 57.4 (8.9), 58.6 (8.8), 64.6 (10.8) and 60.0 (9.4) in urban areas, respectively. The urban males had the highest QOL scores in all domains and rural females had the lowest QOL scores in all domains except in the psychological domain where they scored marginally more than their male counterparts [Table 2]. Using Mann–Whitney U test, P value was <0.001 in all domains when comparing overall QOL scores between rural and urban areas.

The median score in each of the domains was 52.6, 53.3, 53.3 and 54.0. All those with scores less than the median scores were considered to have poor QOL scores and those above median scores were considered to have good QOL scores.

Living alone was significantly associated with poor QOL scores in the physical and social relationship domain in the rural areas. Being disabled and unemployed was associated significantly with poor QOL scores in the psychological and environmental domain, respectively [Table 3]. In urban areas, being female,
Table 1: Baseline characteristics of older persons

| Variable            | Rural n=482 n (%) | Urban n=495 n (%) | P     |
|---------------------|-------------------|-------------------|-------|
| Sex                 |                   |                   |       |
| Males               | 217 (45.0)        | 220 (44.4)        | 0.85  |
| Females             | 265 (55.0)        | 275 (55.6)        |       |
| Age groups (years)  |                   |                   |       |
| 60-69               | 245 (50.8)        | 322 (65.1)        | 0.001 |
| 70-79               | 148 (30.7)        | 136 (27.5)        |       |
| ≥80                 | 89 (18.5)         | 37 (7.5)          |       |
| Religion            |                   |                   |       |
| Hindu               | 479 (99.4)        | 446 (90.1)        | 0.001 |
| Muslim/Christian    | 3 (0.6)           | 49 (9.9)          |       |
| Marital status      |                   |                   |       |
| Married             | 299 (62.0)        | 313 (63.2)        | 0.15  |
| Unmarried/Widowed/Divorced/Separated | 183 (38.0) | 182 (36.8) |       |
| Education           |                   |                   |       |
| Illiterate/No formal schooling | 374 (77.6) | 125 (25.3) | 0.001 |
| Primary             | 39 (8.1)          | 43 (8.7)          |       |
| Middle/Secondary/Higher secondary | 68 (14.1) | 239 (48.3) |       |
| Diploma/Graduate and above | 1 (0.2)  | 88 (17.7)   |       |
| Living status       |                   |                   |       |
| Alone               | 25 (5.2)          | 20 (4)            | 0.06  |
| With spouse only    | 57 (11.8)         | 85 (17.2)         |       |
| With spouse and other members | 242 (50.2) | 219 (44.2) |       |
| With children only or other relatives | 158 (32.8) | 171 (34.5) |       |
| Currently employed  |                   |                   |       |
| Yes                 | 130 (27)          | 88 (17.8)         | 0.001 |
| No                  | 352 (73)          | 407 (82.2)        |       |
| Financial status    |                   |                   |       |
| Dependent           | 82 (17)           | 216 (43.6)        | 0.001 |
| Partially dependent | 357 (74.1)        | 188 (38)          |       |
| Independent         | 43 (8.9)          | 91 (18.4)         |       |

Table 2: Quality of life scores among urban and rural older persons

| QOL domain               | Rural Male n=217 | Rural Female n=265 | Rural Overall n=482 | Urban Male n=220 | Urban Female n=275 | Urban Overall n=495 |
|--------------------------|------------------|--------------------|--------------------|------------------|--------------------|--------------------|
| Physical domain Mean (SD)| 50.9 (5.5)       | 50.2 (5.4)         | 50.5 (5.5)         | 59.8 (8.5)       | 55.5 (8.7)         | 57.4 (8.9)         |
| Psychological domain Mean (SD) | 49.0 (5.4) | 49.4 (5.6) | 49.2 (5.5) | 59.8 (8.6) | 57.6 (8.8) | 58.6 (8.8) |
| Social relationships Mean (SD) | 49.42 (6.9) | 49.3 (6.0) | 49.4 (6.5) | 66.3 (8.9) | 63.1 (11.8) | 64.6 (10.8) |
| Environmental domain Mean (SD) | 48.9 (5.4) | 49.5 (4.9) | 49.3 (5.1) | 61.6 (8.1) | 58.8 (10.1) | 60.0 (9.4) |

Using Mann-Whitney U test. P<0.001 in all domains when comparing overall QOL scores between rural and urban areas.

Table 3: Determinants of QOL among rural older persons n=482

| Variables                      | Categories | Good QOL score n (%) | Poor QOL score n (%) | Unadjusted OR (95% CI) |
|--------------------------------|------------|----------------------|----------------------|------------------------|
| Physical domain                |            |                      |                      |                        |
| Living status                  |            |                      |                      |                        |
| Alone                          | 3 (12)     | 22 (88)              | 5.21 (1.54-17.68)    |                        |
| With others                    | 190 (41.6) | 267 (58.4)           | 1                    |                        |
| Psychological domain           |            |                      |                      |                        |
| Disability                     |            |                      |                      |                        |
| Disabled                       | 72 (23.7)  | 232 (76.3)           | 1.68 (1.11-2.52)     |                        |
| Not disabled                   | 61 (34.3)  | 117 (65.7)           | 1                    |                        |
| Social domain                  |            |                      |                      |                        |
| Living status                  |            |                      |                      |                        |
| Alone                          | 4 (16)     | 21 (84)              | 3.05 (1.03-9.04)     |                        |
| With others                    | 168 (36.8) | 289 (63.2)           | 1                    |                        |
| Environmental domain           |            |                      |                      |                        |
| Occupational status            |            |                      |                      |                        |
| Unemployed                     | 37 (10.5)  | 315 (89.5)           | 2.23 (1.29-3.84)     |                        |
| Currently employed             | 27 (20.8)  | 103 (79.2)           | 1                    |                        |

Various studies have used various questionnaires to measure QOL of older individuals. QOL has been shown in various studies to be dependent on factors that are both clinical and behavioural. The study of QOL assumes importance in that it provides the perspective of the patient. Whilst physicians may assume that treatment provided is sufficient, QOL indicates how

Discussion

not literate and financially dependent were associated with poor QOL score in the physical domain. The above factors along with current occupational status were significantly associated with QOL scores in the psychological, social relationships and environmental domains. However, being currently unemployed had lesser odds of having a poor QOL score in the above three domains in the urban area [Tables 4 and 5].
Table 4: Determinants of physical and psychological domain of QOL among urban older persons \( n=495 \)

| Variables                    | Categories     | Good QOL score \( n (\%) \) | Poor QOL score \( n (\%) \) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) |
|------------------------------|----------------|-------------------------------|-----------------------------|-------------------------|-----------------------|
| Physical domain              |                |                               |                             |                         |                       |
| Education                    | Not literate   | 70 (56)                       | 55 (44)                     | 2.63 (1.71-4.04)        | 2.06 (1.32-3.23)      |
|                              | Literate       | 285 (77)                      | 85 (23)                     | 1                       | 1                     |
| Sex                          | Females        | 173 (62.9)                    | 102 (37.1)                  | 2.82 (1.64-4.32)        | 2.62 (1.65-4.15)      |
|                              | Males          | 182 (82.7)                    | 38 (17.3)                   | 1                       | 1                     |
| Financial dependence         | Dependent      | 273 (67.6)                    | 131 (32.4)                  | 4.37 (2.13-8.97)        | 3.33 (1.59-6.97)      |
|                              | Independent    | 82 (90.1)                     | 9 (9.9)                     | 1                       | 1                     |
| Psychological domain         |                |                               |                             |                         |                       |
| Education                    | Not literate   | 56 (44.8)                     | 69 (55.2)                   | 6.00 (3.84-9.36)        | 4.91 (3.08-7.82)      |
|                              | Literate       | 307 (83)                      | 63 (17)                     | 1                       | 1                     |
| Sex                          | Females        | 193 (70.2)                    | 82 (29.8)                   | 1.44 (0.96-2.17)        | 1.43 (0.87-2.35)      |
|                              | Males          | 170 (77.3)                    | 50 (22.7)                   | 1                       | 1                     |
| Financial dependence         | Dependent      | 284 (70.3)                    | 120 (29.7)                  | 2.78 (1.46-5.29)        | 1.92 (0.96-3.85)      |
|                              | Independent    | 79 (86.8)                     | 12 (13.2)                   | 1                       | 1                     |
| Occupational status          | Unemployed     | 309 (75.9)                    | 98 (24.1)                   | 0.504 (0.31-0.81)       | 0.65 (0.37-1.13)      |
|                              | Currently employed | 54 (61.4)         | 34 (38.6)                   | 1                       | 1                     |

Values in bold represent statistically significant values in logistic regression

Table 5: Determinants of social and environmental domain of QOL among urban older persons (\( n=495 \))

| Variables                  | Categories     | Good QOL score \( n (\%) \) | Poor QOL score \( n (\%) \) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) |
|----------------------------|----------------|-------------------------------|-----------------------------|-------------------------|-----------------------|
| Social domain              |                |                               |                             |                         |                       |
| Education                  | Not literate   | 71 (56.8)                     | 54 (43.2)                   | 6.10 (3.77-9.86)        | 4.84 (2.91-8.04)      |
|                            | Literate       | 329 (88.9)                    | 41 (11.1)                   | 1                       | 1                     |
| Sex                        | Females        | 209 (76)                      | 66 (24)                     | 2.08 (1.28-3.35)        | 2.15 (1.24-3.72)      |
|                            | Males          | 191 (86.8)                    | 29 (13.2)                   | 1                       | 1                     |
| Financial dependence       | Dependent      | 316 (78.2)                    | 88 (21.8)                   | 3.34 (1.49-7.48)        | 2.41 (0.97-5.98)      |
|                            | Independent    | 84 (92.3)                     | 7 (7.7)                     | 1                       | 1                     |
| Living status              | Alone          | 13 (65)                       | 7 (35)                      | 2.36 (0.91-6.10)        | 1.95 (0.65-5.87)      |
|                            | With others    | 387 (81.5)                    | 88 (18.5)                   | 1                       | 1                     |
| Occupational status        | Unemployed     | 337 (82.8)                    | 70 (17.2)                   | 0.52 (0.30-0.88)        | 0.67 (0.37-1.23)      |
|                            | Currently employed | 63 (71.6)         | 25 (28.4)                   | 1                       | 1                     |
| Environmental domain       |                |                               |                             |                         |                       |
| Education                  | Not literate   | 65 (52)                       | 60 (48)                     | 6.66 (4.16-10.66)       | 5.17 (3.16-8.45)      |
|                            | Literate       | 325 (87.8)                    | 45 (12.2)                   | 1                       | 1                     |
| Sex                        | Females        | 206 (74.9)                    | 69 (25.1)                   | 1.71 (1.09-2.68)        | 1.90 (1.13-3.21)      |
|                            | Males          | 184 (83.6)                    | 36 (16.4)                   | 1                       | 1                     |
| Financial dependence       | Dependent      | 307 (76)                      | 97 (24)                     | 3.27 (1.53-7.01)        | 2.23 (0.97-5.10)      |
|                            | Independent    | 83 (91.2)                     | 8 (8.8)                     | 1                       | 1                     |
| Occupational status        | Unemployed     | 332 (81.6)                    | 75 (18.4)                   | 0.437 (0.26-0.72)       | 0.55 (0.31-0.98)      |
|                            | Currently employed | 58 (65.9)         | 30 (34.1)                   | 1                       | 1                     |

Values in bold represent statistically significant values in logistic regression

the patient feels about the management. This can help provide services that are tailored to the needs of individuals to make their QOL better. Assessing an individual's QOL reflects the effects of disease and health interventions had on them.

**QOL scores**

The mean scores were higher for the urban older persons in all domains with highest score observed in social relationships domain (64.58). The lowest score was in the psychological domain of the rural older persons (49.22).

In various studies conducted across India, the QOL domain scores of older persons are varied. Social domain scores tend to be low in most of the reported studies except for a couple of studies from rural Tripura \( 67.32 \pm 15.3 \) and rural Tamil Nadu \( 56.6 \pm 19.5 \). All studies excepting studies done in urban Gujarat \( 64.9 \pm 17.0 \) and urban Karnataka \( 63.5 \pm 12.2 \) have revealed poor scores in the physical health domain of older persons. In the current study, older persons in rural areas have poor QOL physically compared to the urban population. This is expected as older persons suffer from a number of chronic ailments and morbidities and their lesser than optimal health is seen as leading to poor QOL among them.

The psychological domain scores are consistently low in studies. In the current study, the psychological domain score was better off in the urban older persons but was poor in rural older persons much like the above studies. This shows that the psychological domain is an oft-neglected area in the health of the ageing population and services catering to mental health of elderly are minimal or absent.
A study conducted in Kottayam has shown that urban older populations have better QOL in all domains excepting the social domain than the rural older population. The better scores for the urban older population seen in rural urban comparative studies and the current study indicate that there are better services available and accessible to urban population leaving the rural relatively disadvantaged.

Community-dwelling older persons tend to have better QOL compared to those residing in old age homes; however, there are two contradictory studies one from urban Lucknow showing poor QOL among inmates and one from Kolkata interestingly showing better QOL among OAH inmates. The QOL scores among the community-dwelling older persons of Lucknow were still lesser compared to the urban older persons in the current study. From the Kolkata study, we can possibly infer that training voluntary community individuals to provide assistance for elderly at home where caregiver support is absent may help improve QOL.

The above evidences show that QOL assessment and scores are widely varying even across the country and QOL is a reflection of the circumstances and is very contextual. Hence, it enables customization of services that serve the population best.

**Determinants of QOL among older persons**

In the current study, it can be seen that sex, education, occupation and financial dependence were significantly associated with QOL in urban older persons. However, the current study has not found many significant factors for QOL scores among rural older persons.

Most studies have not studied the factors and predictors which affect QOL among older persons. The common factors emerging as strong predictors for QOL are financial dependency of the individual, educational status, socio-economic status, presence of health problems and comorbidities, sex and age of the individual. A study in Portugal has shown that socio-economic position of an older person and the presence or absence of social support are important in determining their QOL. The presence of physical ailments has considerable negative impact on the QOL; however, increasing ability to socially mobilize and actively participate in community activities improves the QOL of older persons.

Similar results have also been observed in the current study among the urban older population. It shows that older people tend to have better QOL when they feel financially secure and have a good social support system. Good working pension systems in place for older people will provide them with more confidence and improve their QOL. As older persons tend to age, their physical QOL tends to deteriorate and this gives a good indication to the more equitable services needed to be provided as people age. Women tend to report lesser QOL which again shows that even as women age they remain neglected. This shows that women continue to be vulnerable and gender-sensitive policies and services are a must even for the aged.

Compared to urban, rural older persons uniformly have lower QOL irrespective of whether they are male or female, educated or not and whether they are financially dependent or not. This shows that just belonging to a rural area is associated with poor QOL among older persons. Rural areas have inequitable resource distribution and strengthening resource allocation and support like primary healthcare and old age pension schemes could improve QOL among rural older adults. Provision of community centres for rest and recreation of older persons may also serve to improve their QOL. The government must ensure that public health facilities, which provide all encompassing primary care services, are present. The public health infrastructure with emphasis on sustained care through primary care practitioners who can provide not only curative but also promotive, preventive and rehabilitative services must be built. All older persons coming to the healthcare facilities must be screened using a QOL tool to see if their QOL has improved with the interventions provided.

The strength of the study lies in the community-based setting where it was conducted and also the large sample size it has covered. The study area was also the field practice area of the medical college, and hence, there was good rapport with the community. There could have been possible information bias as both areas employed different MSWs for data collection in urban and rural areas. However, the MSWs were adequately trained before data collection and the investigators closely supervised the MSWs and cross-checked and validated 5% of the data collected in the field. The study results are context specific and can be limitedly generalized to similar settings because appropriate sampling methods have been followed.

**Conclusion**

The QOL of older persons in rural areas is significantly lower in rural areas compared to urban areas and factors such as sex, education, occupation and financial dependence were significantly associated with QOL of urban older persons. Rural older persons had considerably poor QOL irrespective of most factors. Healthcare and social support services in rural areas for older persons need to be improved to improve their QOL. The determinants of QOL seem to vary in urban and rural areas and further studies are required to study the reasons for these differences.

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**Conflicts of interest**

There are no conflicts of interest.
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