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Research Article

# A PROSPECTIVE OBSERVATIONAL STUDY ON HEALTH-RELATED AND MENTAL QUALITY OF LIFE ASSESSMENT IN GERIATRIC PATIENTS

**SARANYA PUNNIYAKOTTI*, SAMUEL GEORGE P, HEMANTH BHASKAR K, KOUSALYA KALIYAMOORTHY**

**Department of Pharmacy Practice, School of Pharmaceutical Sciences, Vels University, Pallavaram, Chennai - 600 117, Tamil Nadu, India.**
**Email: saro08bpharm@gmail.com**

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**ABSTRACT**

**Objective:** The objective of this study is to evaluate health-related and mental quality of life in geriatric patients and to determine the factors influencing the same.

**Methods:** World Health Organization-BREF, EuroQoL-5D, and Mini Mental State Examination scales were used for evaluation and scoring of health-related and mental quality of life in geriatric patients. Logistic regression models were used to determine the predictors of health-related and mental quality of life. All statistical analyses were performed using IBM SPSS 17.0.

**Results:** Comorbid disease conditions were found to be the significant predictor of health-related quality of life. Education and social history were predictors of cognitive function in the elderly.

**Conclusion:** Patients in these risk line should keenly be monitored for declining health-related and mental quality of life. Disease has a significant impact on the quality of life in geriatric population. However, education, financial status, and social history were found to be the significant predictors of mental health and declining cognition. Hence, geriatric patients in the above-mentioned risk line should keenly be monitored; thereby their quality of life can be focused and improved.

**Keywords:** Comorbidity, Geriatrics, Mental health, physical health, Quality of life.

## INTRODUCTION

Geriatrics is the branch of medicine that deals with the health care of elderly people [1]. Life quality in geriatric patients is affected by the occurrence of diseases and declining organ function. In addition to health problems, late life depression is a common cause of deterioration of quality of life in geriatric patients [2]. Various factors determine the health-related and mental quality of life in the elderly population. Quality of life assessments thus tend to measure the effect of disease and health effects on an individual's quality of life. The quality of life in any population is multi-dimensional [3]. Thus, the aspects of health status, lifestyle, life satisfaction, mental state, and well-being together determine the quality of life [4]. Although geriatric health problems have been well-studied and explored, many insights have not been provided into quality of life and assessment of determining factors. The World Health Organization (WHO) defines health as a dynamic state of physical, psychological, social, and spiritual well-being, not merely the absence of disease or infirmity thus interlinking the terminologies "health" and "quality" of life [5]. To determine the impact of disease and impairment on daily activities and behavior, the WHO has developed the WHO-QOL-100 quality of life assessment instrument. Based on field test reports from 15 centers, the scale consists of 100 items to assess the quality of different facets of life such as physical, psychological, social, and environmental well-being [6]. Mental status is also deteriorated in the elderly patients due to declining cognitive function and late life depression. Cognitive impairment is a significant component affecting the quality of life in the geriatric population [7]. The Mini Mental State Examination (MMSE) is an 11-question measure tool that can be used to systematically and completely assess mental status of an individual. It evaluates the following five areas of cognitive function: Orientation, registration, attention and calculation, recall, and language mounting to a total score of 30 [8]. On the other hand, an instrument for health outcome measures called the EuroQoL (EQ)-5D provides a single index value of an individual's health status [9].

Although the concepts of geriatric health anomalies are well-understood and explored, sufficient data are not available on the health-related and mental quality of life and their underlying factors in the geriatric population. Hence, this study was designed with the aim of evaluating the health-related and mental quality of life and determining the predictors of the same using the WHO-QOL, EQ-5D, and MMSE scales.

## METHODS

The protocol was reviewed, revised, and approved by the Institutional Ethics Committee of Vels University before commencement of the study. The study was prospectively carried out for an entire period of 6 months in a tertiary care hospital. Geriatric patients of both genders visiting the hospital were invited to participate and recruited, after provision of written informed consent. A total of 142 geriatric patients of both genders participated in the study. For inclusion into the study, as per the WHO definitions, patients above the age of 60 were included and those who refused or unable to participate were excluded. The health-related quality of life was assessed using the WHO-BREF and EQ-5D questionnaires whereas mental quality of life was assessed using the MMSE instrument, and scores were generated using corresponding standard scoring systems.

### Statistical methods

Logistic linear regression models were used for the determination of predictors of health-related and mental quality of life. All statistical procedures were performed using IBM SPSS statistics 17.0 package.

## RESULTS

### Patient demographics

About 56% of the studied population were males, whereas 44% were females. Out of 142 patients studied, 62% were between the age of 66-70 years, 24% were between 71 and 75 years, 7% were between 76 and 80 years, and 6% were between 81 and 85 years. The mean age of the studied population was 70.2 ± 5.55 years.

About 92.9% of the patients were married, whereas 7.04% of the patients were married but widowed. No patient had a single marital history. Fifty one percentage of the patients were uneducated, whereas 30% have attended high school, 15% had received elementary education, and 4% had received graduate education.

About 72% of the patients had no history of smoking and alcohol whereas 15% had a history of both, 11% were only smoker, and 1% was alcoholic alone. The comorbid disease status in patients is shown in Fig. 1.

Diabetes mellitus, hypertension, and ischemic heart disease were found to be the common comorbidities in the maximum studied population.

**Assessment of health-related quality of life**

*WHO-BREF*

WHO-BREF scale contains 26 validated questionnaires whereas the WHO-QOL-100 contains 100 questionnaires. Hence, the WHO-BREF raw scores have to be transformed to score in the range of 1-100 using the following formula:

Transformed score = (Score-4) × (100/16).

Definite predictors of domain scores of WHO-BREF scale were determined using logistic linear regression models. For building logistic linear regression models, the following variables were considered as the independent predictors of domain scores. Domain scores 1, 2, 3, and 4 of WHO-BREF scales were individually regressed with the considered independent variables to determine the predictors.

*EQ-5D health QOL and MMSE cognitive scoring*

The European quality of life assessment scale EQ-5D is also used for assessment of quality of life in geriatric patients. The values are tabulated in Table 1 as follows:

Risk factors of cognitive impairment in geriatric patients were also assessed using MMSE (modified MMSE). Education, financial burden, and social history were found to be the significant risk factors of cognitive impairment in geriatric patients.

Among the study population, 1% of the patients are assessed with severe cognitive impairment, 21% with mild cognitive impairment, and 77% with no cognitive impairment.

**DISCUSSION**

Health is a pivotal measure of quality of life; physical and mental health has significant influence on the quality of life [10]. Aging has become an emerging health problem and is considered the most challenging health issue worldwide. Advances in technologies and the development of new medicines have contributed longer life expectancy. However, age has become a significant factor that affects quality of life in elderly patients [11]. This study included a broad spectrum of measurements of cognition and tests were adapted according to educational level. Early detection of cognitive impairments is vital for establishing interventions aimed at reducing inactivity and improving or sustaining a person's activity level and thus quality of life [7].

Various factors determine the health-related and mental quality of life in the elderly population. To determine the impact of disease impairment on daily activities and behavior, we used the WHO-BREF and EQ-5D scoring systems. The quality of life in geriatric patients as defined by the domain 1 scores of WHO-BREF scale was found to be affected by the following variables: Presence of comorbidities, financial status, marital status, and family type. Four linear regression models were built for each domain for determination of predictors; however, the model with the best prediction ability as defined by the regression coefficient (r2) value was only selected.

In geriatric patients, domain scores are affected by the selected predictors. Thus, domain 1 scores suggest that higher number of comorbid diseases and poor financial status are the important factors that deteriorate the quality of life in geriatric patients. Co morbidities have also been shown to significantly affect patient's clinical well-being and possess negative influence on the quality of life [12]. However, quality of life is also affected by marital status with unmarried or widowed, being at more risk than married and type of family. Significant relationship between marital status and quality of life has also been demonstrated in previous studies. However, the relationship appears to differ between age and gender [13]. A regression coefficient of 0.856 suggests a decent predictive ability of the logistic linear regression model built. It should be noted that the beta coefficient for a number of co morbidities is negative,

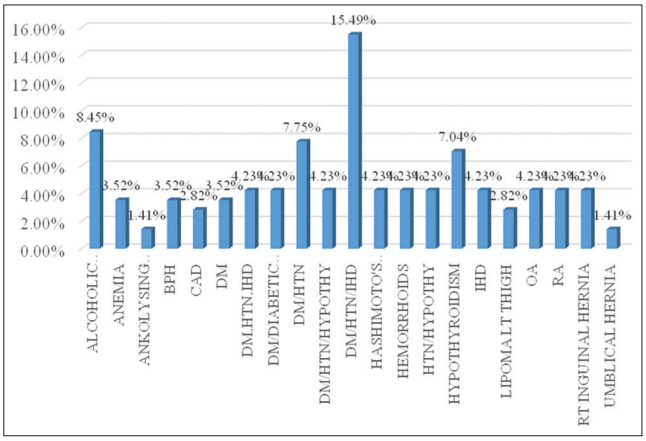


**Fig. 1: Comorbidities in the studied geriatric population**

**Table 1: Quality of life assessment in geriatric patients using the EQ-5D scale**

| EQ-5D dimension | Number of patients | | | | Total |
|---|---|---|---|---|---|
| | 65-70 | 71-75 | 76-80 | Above 80 | |
| Mobility | | | | | |
| No problem | 26 | 8 | 2 | 0 | 36 |
| Problem | 66 | 26 | 8 | 10 | 106 |
| Self-care | | | | | |
| No problem | 70 | 14 | 4 | 6 | 94 |
| Problem | 18 | 20 | 4 | 6 | 48 |
| Usual activity | | | | | |
| No problem | 56 | 16 | 4 | 4 | 80 |
| Problem | 32 | 18 | 6 | 6 | 62 |
| Pain/discomfort | | | | | |
| No problem | 8 | 4 | 0 | 0 | 12 |
| Problem | 80 | 30 | 10 | 10 | 130 |
| Anxiety/depression | | | | | |
| No problem | 10 | 4 | 2 | 4 | 20 |
| Problem | 78 | 30 | 8 | 6 | 122 |

**Table 2: Stepwise multiple linear regression to determine the predictors of domain I scores**

| Model summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **$R^2$** | **Adjusted $R^2$** | **Standard error of the estimate** |
| 1 | 0.821[a] | 0.675 | 0.672 | 12.4901545 |
| 2 | 0.919[b] | 0.844 | 0.842 | 8.6841320 |
| 3 | 0.922[c] | 0.850 | 0.847 | 8.5306351 |
| 4 | 0.925[d] | 0.856 | 0.852 | 8.3935733 |

[d]Predictors: (constant), no. of comorbidities, financial status, marital status, family type, [a,b,c]Model 4 : $R^2$=0.856, p<0.0001

**Table 3: Stepwise multiple linear regression to determine the predictors of domain II scores**

| Model summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **$R^2$** | **Adjusted $R^2$** | **Standard error of the estimate** |
| 1 | 0.809[a] | 0.654 | 0.651 | 10.1398630 |
| 2 | 0.924[b] | 0.854 | 0.851 | 6.6182437 |

[b]Predictors: (Constant), no. of comorbidities, financial status, [a]$R^2$=0.854, p=0.03

**Table 4: Stepwise multiple linear regression to determine the predictors of domain III scores**

| Model summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **$R^2$** | **Adjusted $R^2$** | **Standard error of the estimate** |
| 1 | 0.578[a] | 0.334 | 0.329 | 15.1887420 |
| 2 | 0.670[b] | 0.448 | 0.441 | 13.8700117 |
| 3 | 0.689[c] | 0.475 | 0.463 | 13.5853777 |

[a]Predictors: (Constant), no. of comorbidities, [b]Predictors: (Constant), no. of comorbidities, Financial Status, [c]Predictors: (Constant), no. of comorbidities, financial status, family type

**Table 5: Stepwise multiple linear regression to determine the predictors of domain IV scores**

| Model summary | | | | |
|---|---|---|---|---|
| **Model** | **R** | **$R^2$** | **Adjusted $R^2$** | **Standard error of the estimate** |
| 1 | 796[a] | 634 | 632 | 10.0427254 |
| 2 | 910[b] | 827 | 825 | 6.9271121 |

[a]Predictors: (Constant), no. of comorbidities, [b]Predictors: (Constant), no. of comorbidities, financial status

whereas that of financial status is positive. This indicates an inverse correlation as observed with the number of co morbidities, whereas a positive correlation as observed with financial status, i.e., quality of life decreases with increase in the number of comorbid conditions, whereas it decreases as the financial status decreases. The negative sign in marital status indicates that unmarried as risk group, since "unmarried and others" were coded as zero while defining dichotomous categorical inputs.

Similarly, the number of co morbidities and financial status was found to be the significant predictors of psychological function as described by domain 2 scores. Thus, more number of co morbidities and poorer financial status were found to be the factors affecting psychological quality of life in geriatric patients. The summaries of the regression models built for domain 2, 3, and 4 scores are given in Tables 2-5.

Multiple regression models were created for identifying the predictors for cognitive function. Education, financial burden, and social history were found to be the significant risk factors of cognitive impairment in geriatric patients.

## CONCLUSION

Comorbidities and financial status are found to be the significant predictors of health-related quality of life in geriatric patients. Thus, a disease has a significant impact on the quality of life in the geriatric population. However, education, financial status, and social history were found to be the significant predictors of mental health and declining cognition. Hence, geriatric patients in the above-mentioned risk line should be keenly monitored; thereby their quality of life can be focused and improved.

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