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Original Article

# Evaluation of Health-Related Quality of Life in Cardiac Disease Patients in Tertiary Care Teaching Hospital

**Shruti Khandke[1], Vaishanvi Vanshakrithmath[1], Abhishek K V[1], Surendra V[1], Sanatkumar Bharamu Nyamagoud[2,*]**

[1]Department of Pharmacy Practice, KLE College of Pharmacy, Hubballi. KLE Academy of Higher Education and Research (Deemed-to-be-University), Belagavi, Karnataka, INDIA.
[2]Department of Pharmacy Practice, SDM Trust's Danigond College of Pharmacy, Terdal, Bagalkot, Karnataka, INDIA.

## ABSTRACT

**Background:** Cardiovascular Diseases (CVD) a leading cause of morbidity and mortality globally. This study aimed to assess the demographic profile, major diagnoses, and Health-Related Quality of Life (HRQOL) in CVD patients, while examining the influence of socioeconomic factors, educational background, and social habits. **Materials and Methods:** A cross-sectional study was conducted among 250 CVD patients aged 18 to 92 years. Demographic and clinical data were collected. Socioeconomic status was assessed using the updated Kuppuswamy scale. HRQOL was measured using standard domains and analysed with the chi square test. **Results:** Among the participants, 61.6% were male and 38.4% female, consistent with prior studies indicating higher CVD prevalence in older males. The most common diagnoses were Acute Coronary Syndrome-MI (46%), Unstable Angina (20.8%), and IHD-MI (11.2%). Social habits were 12% (alcohol use), 18.4% (smoking), and 6% (tobacco chewing), with combined habits in 8.8% of patients. HRQOL scores were highest in the Mental Health domain (M=60.65, SD=5.36) and lowest in Role Physical (M=22.50, SD=41.63) and Role Emotional (M=26.80, SD=44.17) domains. Patients with adverse social habits showed lower scores in the Pain and General Health domains. Urban residents and literate individuals generally reported higher HRQOL scores. **Conclusion:** IHD remains the predominant cardiovascular emergency, particularly among older males. Social habits and lower socioeconomic or educational status negatively impact HRQOL. These findings highlight the need for targeted health education, lifestyle interventions, and social support to improve outcomes in CVD patients.

**Keywords:** Cardiovascular Disease, HRQoL, Ischemic Heart Disease, Myocardial Infarction.

**Correspondence:**
**Dr. Sanatkumar Bharamu Nyamagoud**
Associate Professor and Head, Department of Pharmacy Practice, SDM Trust's Danigond College of Pharmacy, Terdal, Bagalkot, Karnataka, INDIA.
Email: dr.sanathnyamagoud@gmail.com

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## INTRODUCTION

The cardiac system is made up of the heart and the blood arteries that connect it. Infections and inflammatory illnesses such as endocarditis, rheumatic heart disease, and electrical conduction disorders can all have an impact on this system. There are four major forms of cardiovascular conditions: Coronary Artery Disease, cerebrovascular disease, Peripheral Vascular disease, and aortic atherosclerosis Chest pain, arm pain, jaw pain, back, unusual exhaustion, dizziness, headache, anxiety, difficulty in breathing, difficulty sleeping, and issues with digestion were all outlined in ACS (Olvera *et al*., 2025; Jurgens *et al*., 2022). According to the global burden disease research 2019, 523 million instances of cardiovascular disease, The fatalities was around 8.9 million, Low and middle-income nations are account for around 80% of CVD related (Sarma *et al*., 2021). The primary cause of death worldwide and contributor in disability are, namely Ischemic Heart Disease (IHD) and stroke (Roth *et al*., 2020). One-fifth of all CVD-related fatalities worldwide occur in India, particularly among younger people. Despite the fact that Cardiovascular Disease (CVD) is acknowledged as significant public health concern in India, the population's poor rates of diagnosis, treatment, and adherence to evidence-based treatment guidelines show that access to cardiovascular care is still limited (Shannawaz *et al*., 2025). Significant improvements in the treatment with heart disease, which has resulted in extension of life expectancy (Höfer *et al*., 2020). HRQoL, represents a patient's physical, psychological, social, and emotional well-being, is frequently utilized to evaluate a patient's health (Wan *et al*., 2023). The evaluation of a patient's health status should be complementary to all other standard modalities of assessment and serve as a crucial indicator of health and the quality of care due to the strong correlation between health status and cardiovascular disease and treatment efficacy (Conradie *et al*., 2022). Numerous tools have been created to measure HRQoL, and some HRQoL guides include population norms and distributions about age, gender, or illness. One of the most popular generic HRQOL assessments for both the general

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public and IHD patients is the Short Form-36 health survey. There eight scales on which the 36 items of the SF-36 are scored. As a crucial component (HRQL) has grown in importance as a health care outcome indicator, particularly for patients with cardiovascular disorders (Huber *et al*., 20216) patients with CVD, low HRQoL has been demonstrated to predict an increased risk of hospital readmission and death (Phyo *et al*., 2021).

## MATERIALS AND METHODS

### Study Site

The research was conducted in Cardiac Department at Vivekananda General Hospital, Hubballi, Karnataka.

### Study Design And Data Collection

From October 2024 to March 2025, a cross-sectional observational research was carried out. The sample size was established using a preliminary research. Later that, 250 patients, study employing SF36 standard questionnaire to assess the HRQOL in CVD patients. A set of questions were provided to study subjects and guided to fill the goggle form, the interviewer used the questionnaire to make sure their responses were clear and comprehensive. After completion, subjects were exposed to pharmacist counselling which covered overall information regarding CVD diseases and importance of medication and effect of HRQOL.

### Study Period

The study was carried over six months in cardiology department at Vivekananda general hospital, Hubballi, Karnataka.

### Sample Size Calculation

Based on the prevalence results published in earlier research, the sample size was estimated to be 250 with a 95% confidence interval and 5% margin error using a conventional formula.

### Study Population

- **Criteria for inclusion:** All patients with heart-related issues, individuals over the age of 18, individuals of various sexes, and those with and without concomitant diseases.
- **Exclusion criteria:** Include patients who admitted in cardiology department and vulnerable groups such as children and breastfeeding.

### Study Instrument

The SF-36 health survey is a standardized method for evaluating quality of life. The validated regional version could not be evaluated at time of study, it was translated into kannada and explained to the participants to ensure understanding. SF36 was widely validated and dependable. Its 36 multiple-choice questions measure eight health Domins: physical functioning (10), Role physical (04), pain (02), general health (05), energy and vitality (04), social functioning (02s), role emotional (03), and mental health (05 items). By converting the ratings to a 0-100 scale, we can quantify the scales. Better health is reflected by higher values on each health domain (Chatzinikolaou *et al*., 2021).

### Statistical Analysis

The statistics were performed using version 29.0 of the SPSS. The mean and standard deviation were used to show continuous variables, whereas numbers and percentages were used to show categorical data. The Chi Square and Mann Whitney U tests were used to analyse HRQOL.

## RESULTS

Table 1 summarizes the demographics characteristics of research subjects. Out of the 250 patients 154 (62%) were male and 96 (38%) were female, suggesting a higher incidence of CVDIs in the population was males. Highest number of patients from 48-62 years age group 113 (45%) followed by 63-77 years: 79 (32%), 33-47 years: 35 (14%), 78-92 years: 17(7%), 18-32 years: 6 (2%). Around 137 (55%) patients were from urban areas and 113 (45%) from rural, educational background of the patients was vary, with 210(86%) being educated and 40 (16%) uneducated, 29% (73) of the participants were primary school, 32% (79) of the participants were middle school, 6% (15) of the subjects were high school, 12% (30) of the participants were intermediate, 3% (8) of the subjects were graduate and 2% (5) of the participants were professional degree. Comorbidities were prevalent among the patients, 78 (31%) had hypertension, and 63 (25%) had type 2 diabetes mellitus and IHD 33(13%).There were 120 subjects have a history of social habits followed by 130(52%) Among 18%(*n*=46) of participants having smoking habit, 12% (*n*=30) of the participants having alcoholic habit, 6% (*n*=15) of the participants having tobacco chewing habit, 9% (*n*=22) of the participants having both smoking and alcohol usage habit. In the research sample the diagnosis commonly patient had ACS MI 115 (46%), 52(20.80%) subject had IHD-Unstable angina, 28 (11.20%) subjects had a IHD-MI, 16 (6.40%) had a IHD followed by others disease like unstable angina, rheumatic heart disease, dilated cardiomyopathy, pulmonary thromboembolism, AV dissociation, ACS-Cardiogenic Shock, ACS-Wellens type A&B, HTN, DM, COPD, severe calcified AS. Various laboratory tests were analyzed (LFT, RFT, Lipid profile test, electrolytes and blood reports). Among 66 (26%) subjects were showed LFT abnormalities, 28 (11%) subjects were showed RFT abnormalities, 5 (2%) subjects were showed lipid profile abnormalities, 42 (17%) subjects were showed electrolytes abnormalities, 20 (8%) subjects were showed sugar level imbalance and 10 (4%) subjects were showed RBC impairment in study population Table 1.

### Distribution of Mean Scores and Standard Deviations across Quality of Life Domains

Assessing HRQOL using SF-36 questionnaire, Analysis of Mean and standard deviation of HRQOL in study population. In HRQOL there are 8 domains. Physical 53.80±38.78, Role physical 22.50±41.63, pain 50.52±17.07, general health 55.04±21.10, social functioning 49.35±8.39, vitality 55.64±21.18, role emotional 26.80±44.17, mental health 60.65±5.36. The role physical and emotional have low mean suggesting the heterogeneous responses and limitation in daily activities some have no limitation. As present in Figure 1.

### Association between Education, Gender, and HRQOL

Among the domains, the illiterate's vitality showed the greatest average of 56.87±18.06, while their role physical showed the lowest average of 17.50±38.48. HRQOL related to Gender the average mental health score for males is 60.70±5.29, whereas the average physical score for women is 14.73±35.63. The chi square test is employed in related to both catogeries to determine significance when values <0.001 of *p*-value <0.05 is presented in Table 2.

### Association of Socioeconomic Class with HRQOL Domains

In the eight dimensions, the upper middle class's general health and physical functioning have the greatest average (57.33±22.69) (53.33±37.00) indicating better health status, while the lower middle class's role physical and role emotional has the lowest average (21.31±41.11) (26.22±44.16). It is reflecting greater limitation in daily activities due to physical and emotional problems some had no limitation indicates substantial variability. Chi square tests and kruskal wallis tests have been used to determine significance when values <0.001 of *p*-value as presented in Table 3.

### Association between Age Groups and HRQOL Domains

In Table 4, Ages 18 to 32 had the greatest average score in the eight categories (62.50±42.98), while ages 48 to 62 obtained the lowest score (18.14±38.4). When social functioning exhibits significance having a *p*-value less than 0.05, was determined by chi square test. As presented in Table 4.

## DISCUSSION

Our study included 250 patients with the age group ranging from 18 to 92 years, in that 154 (61.6%) were male and 96 (38.4%) were female. There were 150 patients in a research by Reshma *et al.* (2020), of whom 66% were men, 44% were women, and 24% were older than 60. The results of our study with regarding patient population and in consistence found to be similar with the previous study indicating that male with age of 60-69 were more prone to have CVD comparative to that of female. Our major diagnosis included ACS-Myocardial infraction (46%), IHD-Unstable angina (20.80%), ischemic heart disease-MI (11.20%) and Rheumatic heart disease (2.80%). where a study in Abdelrahman *et al.* (2023) showed NSTEMI (28.37%) and STEMI (26.52%) as a major diagnosis. A similar finding was also seen were CHF (44.4%) and HTN (43.1). As to the findings of Tsnate *et al.* (2024), CAD was the second most prevalent cardiovascular emergency, behind ischemic heart disease. In this study, we assessed HRQOL using Mann Whitney U Test and its determinants to find determine how patients' quality of life is affected. The updated Kuppuswamy scale was used to determine the socioeconomic class of the patients and social habits, whether the patients lived in an urban or rural area, and level of education. In our study sample, the proportion of people from urban and rural areas are 137 (54.80%) and 113 (45.20%) respectively. Of the subjects, (*n*=368) were from urban and (*n*=332) were from rural according to study conducted by Jafar *et al.* (2019). Various social

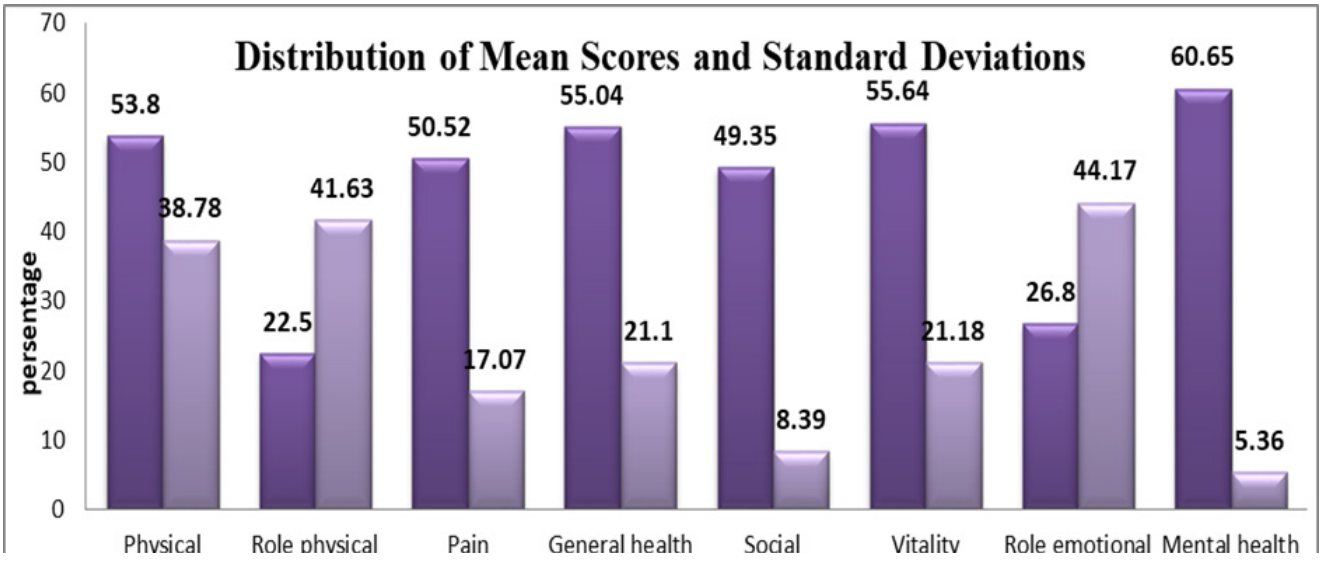


**Figure 1:** Distribution of mean scores and SD.

**Table 1: Distribution of Study Participants According to Demographic Characteristics (*N*=250).**

| Sl. No. | Demographics | Variables | *N* (250) | Percentage % |
|---|---|---|---|---|
| 1. | Gender | Male | 154 | 62% |
| | | Female | 96 | 38% |
| 2. | Age | 18-32 | 6 | 2% |
| | | 33-47 | 35 | 14% |
| | | 48-62 | 113 | 45% |
| | | 63-77 | 79 | 32% |
| | | 78-92 | 17 | 7% |
| 3. | Social habits | No | 130 | 52% |
| | | Yes | 120 | 48% |
| | | Smoking | 46 | 18% |
| | | Alcoholic | 30 | 12% |
| | | Tobacco | 15 | 6% |
| | | Smoking and alcoholic | 22 | 9% |
| | | Tobacco and smoking | 2 | 1% |
| | | Tobacco and alcoholic | 2 | 1% |
| | | Smoking and alcoholic and tobacco | 3 | 1% |
| 4. | Residence | Urban | 137 | 55% |
| | | Rural | 113 | 45% |
| 5. | Education | Illiterate | 40 | 16% |
| | | Literate | 210 | 84% |
| 6. | Qualification | Illiterate | 40 | 16% |
| | | Primary school | 73 | 29% |
| | | Middle school | 79 | 32% |
| | | High school | 15 | 6% |
| | | Intermediate | 30 | 12% |
| | | Graduate | 8 | 2% |
| | | Professional degree | 5 | 2% |
| 7. | Socio-economic Status | Upper class | 5 | 2% |
| | | Upper middle class | 30 | 12% |
| | | Lower middle class | 121 | 37% |
| | | Upper lower class | 92 | 49% |
| | | Lower class | | 1% |
| 8. | Diagnosis | IHD | | 7 |
| | | IHD-Unstable angina | | 5 |
| | | IHD-MI | | 1 |

habits were noticed, Among the 250 individuals, 30 (12%) drank alcohol, and 46 (18.4%) reported smoking, 15 participants (6%), chewed tobacco. According to (Ding *et al*., 2021) maximum 22% Relative Risk (RR) reduction at about 8 g/day for cardiovascular mortality and 18% at 7 g/day for all-cause mortality among patients with Myocardial Infarction (MI), angina, compared to non-drinkers, Patients having CVD are more vulnerable to recurrent cardiovascular events, which can seriously impair their quality of life. According to Kershaw and colleagues' examination of Dutch participants, smoking behavior was responsible for over 27% of the correlation between education and coronary heart disease (Carter *et al*., 2019).

The Kuppuswamy scale, showed that the lower-middle class included the largest percentage of participants 48.4%, while the lower class had the lowest representation. Regarding, (HRQOL) domains study, the Mental Health domain had the highest mean

score (M=60.65, SD=5.36), followed by the Vitality domain (M=55.64, SD=21.18) and the General Health domain (M=55.04, SD=21.10). Role Emotional (M=26.80, SD=44.17) and Role Physical (M=22.50, SD=41.63) had the lowest scores, suggesting more disability in these domains, concluded that there was a correlation between emotional vitality and CHD based on their emotional vitality's RR of 0.68 for CHD lowering the impact in patients with CVD by 27%. In general, people with social habits had slightly lower mean scores in domains like Pain (M=49.50, SD=16.89) and General Health (M=52.46, SD=20.31) than people without social habits (Pain: M=52.46, SD=17.13; General Health: M=57.42, SD=21.62) when HRQOL was examined in relation to social habits. Remarkably, there was little difference in the Mental Health category between those who had social habits (M=61.07, SD=5.02) and those who did not (M=60.28, SD=5.66). These findings are consistent with those of BMC publication the relationship between mental HR-QoL and social /emotional loneliness. Older adults who are lonely score 9.73 points lower on the MCS-12 than those who are not, and loneliness was linked to worse mental HR-QoL ($p< 0.001$) (Tan *et al.*, 2020). The current study has several limitations, including single center that restricts generalizability a limited sample size in socioeconomic subgroups, A skewed distribution that affects mean values and high variability that may have impact on QOL outcomes.

**Table 2: Association between Education, Gender, and HRQOL.**

| Domains | Characteristics | | *N* | Mean | Standard deviation | Significance | Correlation |
|---|---|---|---|---|---|---|---|
| Physical | Education | Illiterate | 40 | 53.2500 | 37.27153 | 0.001* | 0.000 |
| | | Literate | 210 | 53.9048 | 39.15056 | | |
| | Gender | Female | 96 | 58.7368 | 37.04489 | 0.230 | 0.231 |
| | | Male | 154 | 50.7792 | 39.75468 | | |
| Role physical | Education | Illiterate | 40 | 17.5000 | 38.48076 | 0.001* | 0.001 |
| | | Literate | 210 | 23.4524 | 42.22417 | | |
| | Gender | Female | 96 | 14.7368 | 35.63533 | 0.016* | 0.016 |
| | | Male | 154 | 27.4351 | 44.44368 | | |
| Pain | Education | Illiterate | 40 | 53.5000 | 15.61557 | 0.001* | 0.000 |
| | | Literate | 210 | 49.9524 | 17.32044 | | |
| | Gender | Female | 96 | 47.8947 | 17.00405 | 0.050* | 0.050 |
| | | Male | 154 | 52.2078 | 17.00622 | | |
| General health | Education | Illiterate | 40 | 56.2500 | 19.50509 | 0.001* | 0.000 |
| | | Literate | 210 | 54.8095 | 21.43672 | | |
| | Gender | Female | 96 | 50.8947 | 20.52475 | 0.023* | 0.023 |
| | | Male | 154 | 57.5325 | 21.18427 | | |
| Social functioning | Education | Illiterate | 40 | 50.3125 | 8.24675 | 0.316 | 0.317 |
| | | Literate | 210 | 49.1667 | 8.43045 | | |
| | Gender | Female | 96 | 48.2895 | 7.86575 | 0.088 | 0.089 |
| | | Male | 154 | 50.0812 | 8.63389 | | |
| Vitality | Education | Illiterate | 40 | 56.8750 | 18.06993 | 0.001* | 0.000 |
| | | Literate | 210 | 55.4048 | 21.76325 | | |
| | Gender | Female | 96 | 51.2105 | 20.90653 | 0.004* | 0.004 |
| | | Male | 154 | 58.2792 | 21.01493 | | |
| Role emotional | Education | Illiterate | 40 | 27.5000 | 45.22026 | 0.001* | 0.001 |
| | | Literate | 210 | 26.6667 | 44.08681 | | |
| | Gender | Female | 96 | 16.8421 | 37.62251 | 0.004* | 0.003 |
| | | Male | 154 | 33.1169 | 46.90830 | | |
| Mental health | Education | Illiterate | 40 | 60.4000 | 4.13118 | 0.258 | 0.259 |
| | | Literate | 210 | 60.7048 | 5.57837 | | |
| | Gender | Female | 96 | 60.6316 | 5.51411 | 0.768 | 0.768 |
| | | Male | 154 | 60.7013 | 5.29660 | | |

**Table 3: Association of Socioeconomic Class with HRQOL Domains.**

| Domains | Socio-economic class | N | Mean | Standard deviation | Significance | Correlation |
|---|---|---|---|---|---|---|
| Physical | Lower class | 2 | 50.0000 | 70.71068 | 0.001* | 0.000 |
| | Lower middle class | 122 | 21.3115 | 41.11968 | | |
| | Upper class | 5 | 48.0000 | 48.55409 | | |
| | Upper lower class | 91 | 53.5714 | 39.31557 | | |
| | Upper middle class | 30 | 53.3333 | 37.00730 | | |
| Role physical | Lower class | 2 | 50.0000 | 70.71068 | 0.001* | 0.000 |
| | Lower middle class | 122 | 21.3115 | 41.11968 | | |
| | Upper class | 5 | 40.0000 | 54.77226 | | |
| | Upper lower class | 91 | 22.8022 | 41.94049 | | |
| | Upper middle class | 30 | 21.6667 | 40.86001 | | |
| Pain | Lower class | 2 | 55.0000 | 21.21320 | 0.001* | 0.000 |
| | Lower middle class | 122 | 49.0984 | 17.00773 | | |
| | Upper class | 5 | 54.0000 | 26.07681 | | |
| | Upper lower class | 91 | 51.0989 | 15.45248 | | |
| | Upper middle class | 30 | 53.6667 | 20.59182 | | |
| General health | Lower class | 2 | 55.0000 | 21.21320 | 0.001* | 0.000 |
| | Lower middle class | 122 | 53.2377 | 20.85885 | | |
| | Upper class | 5 | 57.0000 | 27.97320 | | |
| | Upper lower class | 91 | 56.5934 | 20.81505 | | |
| | Upper middle class | 30 | 57.3333 | 22.69488 | | |
| Social functioning | Lower class | 2 | 56.2500 | 8.83883 | 0.766 | 0.835 |
| | Lower middle class | 122 | 48.9754 | 8.44130 | | |
| | Upper class | 5 | 50.0000 | 8.83883 | | |
| | Upper lower class | 91 | 49.1758 | 8.49881 | | |
| | Upper middle class | 30 | 50.8333 | 7.99605 | | |
| Vitality | Lower class | 2 | 47.5000 | 31.81981 | 0.001* | 0.000 |
| | Lower middle class | 122 | 48.9754 | 8.44130 | | |
| | Upper class | 5 | 57.0000 | 25.39685 | | |
| | Upper lower class | 91 | 56.0440 | 21.16754 | | |
| | Upper middle class | 30 | 56.1667 | 24.83335 | | |
| Role emotional | Lower class | 2 | 50.0000 | 70.71068 | 0.001* | 0.000 |
| | Lower middle class | 122 | 26.2295 | 44.16962 | | |
| | Upper class | 5 | 40.0000 | 54.77226 | | |
| | Upper lower class | 91 | 27.1062 | 44.42002 | | |
| | Upper middle class | 30 | 24.4444 | 42.82490 | | |
| Mental health | Lower class | 2 | 62.0000 | 2.82843 | 0.391 | 0.412 |
| | Lower middle class | 122 | 60.8525 | 5.14849 | | |
| | Upper class | 5 | 56.0000 | 9.38083 | | |
| | Upper lower class | 91 | 60.1319 | 5.41440 | | |
| | Upper middle class | 30 | 62.1333 | 5.11747 | | |

**Table 4: Association between Age Groups and HRQOL Domains.**

| Domains | Age | N | Mean | Standard deviation | Significance | Correlation |
|---|---|---|---|---|---|---|
| Physical | 18-32 | 6 | 62.5000 | 42.98255 | 0.503 | 0.311 |
| | 33-47 | 35 | 57.1429 | 38.10368 | | |
| | 48-62 | 113 | 54.1150 | 37.14853 | | |
| | 63-77 | 79 | 54.4937 | 41.11113 | | |
| | 78-92 | 17 | 38.5294 | 39.28123 | | |
| Role physical | 18-32 | 6 | 29.1667 | 45.87120 | 0.011* | 0.228 |
| | 33-47 | 35 | 22.8571 | 42.60430 | | |
| | 48-62 | 113 | 18.1416 | 38.41848 | | |
| | 63-77 | 79 | 24.0506 | 43.01219 | | |
| | 78-92 | 17 | 41.1765 | 50.72997 | | |
| Pain | 18-32 | 6 | 48.3333 | 21.36976 | 0.913 | 0.567 |
| | 33-47 | 35 | 50.0000 | 15.71810 | | |
| | 48-62 | 113 | 50.7965 | 16.48276 | | |
| | 63-77 | 79 | 50.2532 | 19.41284 | | |
| | 78-92 | 17 | 51.7647 | 11.31111 | | |
| General health | 18-32 | 6 | 46.6667 | 30.60501 | 0.448 | 0.263 |
| | 33-47 | 35 | 54.2857 | 19.37034 | | |
| | 48-62 | 113 | 55.0000 | 20.84167 | | |
| | 63-77 | 79 | 55.6962 | 22.06828 | | |
| | 78-92 | 17 | 56.7647 | 19.91711 | | |
| Social functioning | 18-32 | 6 | 45.8333 | 15.13825 | 0.031* | 0.054 |
| | 33-47 | 35 | 48.5714 | 8.45154 | | |
| | 48-62 | 113 | 50.6637 | 8.15597 | | |
| | 63-77 | 79 | 48.4177 | 7.84646 | | |
| | 78-92 | 17 | 47.7941 | 9.09509 | | |
| Vitality | 18-32 | 6 | 45.8333 | 29.22613 | 0.503 | 0.158 |
| | 33-47 | 35 | 55.0000 | 20.14652 | | |
| | 48-62 | 113 | 55.4425 | 20.12858 | | |
| | 63-77 | 79 | 55.6329 | 22.59406 | | |
| | 78-92 | 17 | 61.7647 | 21.35571 | | |

## CONCLUSION

The study, which was conducted out on 250 cardiac inpatients at Vivekananda general hospital in hubballi, provides important information regarding the clinical, social and demographic characteristics. Male patients between the ages of 50-69 made up the majority, and most of them from urban areas. According to the kuppuswamy scale, a sizable section of the population was in the lower middle socioeconomic level. A comprehensive understanding of patient well-being was made possible by the analysis of HRQOL. Physical and emotional role limits were severely compromised, indicating areas that require focused care, even though categories like mental health and vitality displayed somewhat higher scores. The significance of tailored care techniques is further shown by the correlation between HRQOL and sociodemographic characteristics, educational attainment, place of residence, and socioeconomic position Furthermore, improving long-term outcomes for patients with CVD requires addressing discrepancies in adherence and HRQOL as well as incorporating sociodemographic aspects into care regimens. According to these findings, hospitals should implement pharmaceutical care models that prioritize patient-centered, methods of treating cardiovascular disease.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## ETHICS STATEMENT

The written informed consent was taken from each subject, the KLE College of Pharmacy Ethical committee gave approval to study (IEC reference code: KLECOPH/IEC/2024-25/02).

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