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Original Article

Health Related Quality of Life and its Predictors among Dyslipidemia Patients: A Cross-Sectional Study

Ramesh Bhandari*, Madiwalayya Shivkantayya Ganachari

Department of Pharmacy Practice, KLE College of Pharmacy Belagavi, KLE Academy of Higher Education and Research, Belagavi, Karnataka, INDIA.

ABSTRACT

Objectives: To evaluate Health-Related Quality of Life (HRQoL) and its determinants among dyslipidemia patients. **Materials and Methods:** A cross-sectional study was conducted among patients with dyslipidemia during 6 months at a tertiary care hospital. We included adult patients admitted to the hospital diagnosed with dyslipidemia also no restrictions were imposed whether the patients had complications of dyslipidemia. 36-Item Short Form Survey (SF-36) was used to calculate HRQoL. Multivariable generalized linear regression was used to identify associated factors. **Results:** The overall Health-Related Quality of Life was found to be 52.52±14.35. Role limitations due to physical health, emotional health, social functioning and pain were the subdomains where the mean scores were less than half. Age was a negative predictor, while primary, secondary, higher secondary and graduate levels of education were positive predictors of Health-Related Quality of Life among dyslipidemia patients. **Conclusion:** Findings from this study suggest that, despite a decrease in overall Health-Related Quality of Life (HRQoL), the lowest scores were observed in role limitations due to physical health, emotional health, social functioning and pain. Age and educational level significantly influence Health-Related Quality of Life among dyslipidemia patients.

Keywords: Drug utilization study, Dyslipidemia, Functional disability, Physical fitness, Quality of life.

Correspondence:
Dr. Ramesh Bhandari
Assistant Professor, Department of Pharmacy Practice, KLE College of Pharmacy Belagavi, KLE Academy of Higher Education and Research (KAHER), Nehru Nagar, Belagavi-590010, Karnataka, INDIA.
Email: ramesh_2417@yahoo.com

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INTRODUCTION

Dyslipidemias are challenging to diagnose due to the absence of symptoms, yet they are commonly treated as chronic conditions. They are characterized by abnormal levels of serum cholesterol and/or triglycerides in the body. The most common complication Associated with Dyslipidemia Is Atherosclerotic Cardiovascular Disease (ASCVD), which significantly contributes to morbidity and mortality (Berberich *et al*., 2022). Advanced age is considered one of the most critical risk factors for ASCVD. Nonetheless, recent research has demonstrated an increasing incidence of ASCVD in younger populations (Liu *et al*., 2023; Stone *et al*., 2022). The NCD-Risk factor collaboration study, encompassing data from over 102 million individuals across 200 countries, found that while global age-standardized mean non-HDL cholesterol levels remained largely stable from 1980 to 2018, many high-income countries that initially exhibited the highest levels saw significant declines during this period (Pirillo *et al*., 2021). Estimates from the Global Burden of Disease (GBD) database indicate that in 2019, high LDL Cholesterol (LDL-C) levels were responsible for approximately 3.78 million deaths from Ischemic Heart Disease (IHD) and 0.61 million deaths from ischemic stroke worldwide, marking increases since 1990. Notably, Asian countries experienced significant rises in mortality attributed to high LDL-C levels, with deaths from high non-High density lipoprotein cholesterol tripling in East Asia and more than doubling in Southeast Asia between 1990 and 2017. While global age-standardized death rates for IHD and ischemic stroke related to high LDL-C have declined in most Western countries over the past three decades, these rates have either stagnated or risen significantly in Central and East Asia, highlighting a concerning trend in these regions (Liu *et al*., 2022). Given this, various research studies have focused on effectively treating dyslipidemia. Most dyslipidemia treatments focus on the primary goal of reducing elevated serum LDL-C levels (Arambepola *et al*., 2007; Sadeq *et al*., 2023).

According to World Health Organization (WHO), Quality of Life refers to an individual's perception of their life influenced by the cultural and value systems surrounding them, as well as their goals, expectations, standards and concerns (WHOQoL, 2024). It is often used synonymously with Health-Related Quality of Life (HRQoL); however, this term specifically narrows the concept of

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quality of life to aspects relevant to health (Orbell *et al*., 2013). HRQoL is utilized across various fields, including public health, psychology, economics and social work, as an outcome measure (Shockey *et al*., 2017; HRQoL, 2024). Health-Related Quality of Life (HRQoL) is assessed using patient-centered outcome questionnaires to evaluate both the positive and negative impacts of chronic medical conditions on physical, emotional, psychological and social functioning and to inform the development and evaluation of new drug treatments and devices (HRQoL, 2024). Various validated tools are available to assess HRQoL, both general tools and those specific to particular diseases. Commonly used tools are 36-Item Short Form Survey (SF-36), 12-Item Short Form Survey (SF-12), The World Health Organization Quality of Life (WHOQOL-100), World Health Organization Quality of Life Brief (WHOQOL-BREF), FACT-General (G), European Quality of Life Instrument (EQ-5D-5L / EQ-5D), Health Utility Index (HUI) etc., (WHOQOL 2024; (Sitlinger A and Zafar SY, 2018); SFS, 2024; Hernández-Segura *et al*., 2022).

Previously, the researchers have examined the impact of several chronic diseases on HRQoL (Perveen *et al*., 2024; Suhail *et al*., 2021; Johansen *et al*., 2023). A Recent cross-sectional study conducted among 457 elderly Chinese population with dyslipidemia reveals that pain/discomfort was the most frequent complaint and Education, comorbidities, occupation, marital status, smoking, passive smoking, chronic disease core knowledge were significantly associated with HRQoL (Du *et al*., 2023). A study conducted on the Indian population suggested that patient-related factors, such as forgetfulness, low education levels, and the absence of dyslipidemia symptoms, pose major challenges in its management (Bhandari *et al*., 2024). Another study in Jordan conclude that necessity of dyslipidemia medication and controlled lipid profile is positively associated with HRQoL whereas, number of medications, duration of dyslipidemia and patients on high intensity statins were associated with lower HRQoL (Jarab *et al*., 2021). Therefore, the purpose of this study was to evaluate Health-Related Quality of Life (HRQOL) and its determinants among dyslipidemia patients in India.

MATERIALS AND METHODS

We conducted a cross-sectional study among patients with dyslipidemia during six months at a tertiary care hospital. We included adult patients admitted to the hospital diagnosed with dyslipidemia also no restrictions were imposed whether the patients had complications of dyslipidemia.

Health related quality of life measurement

The outcome of interest was HRQoL. To calculate HRQoL, 36-Item Short Form Survey (SF-36), also known as RAND 36-Item Health Survey was used (SFS, 2024). The instrument measures HRQoL in eight domain namely physical functioning, role limitations due to physical health, role limitations due to personal or emotional problems, energy/fatigue, emotional well-being, social functioning, pain and general health.

Data was collected by clinical pharmacist. Along with SF-36 item questionnaire, the data collection form includes the sociodemographic variables and treatment received by the patients.

Data analysis

Data were summarized using descriptive statistics. The quality-of-life score was described as mean±standard deviation. Multivariable generalized linear regression model was used to identify the associated factors. The HRQoL variable was normally distributed which was evident upon performing Shapiro-Wilk test. Average HRQoL was considered as dependent variable and sociodemographic variables are considered as independent variables. All data were analyzed using Statistical Package for Social Sciences (SPSS) version 29.0 (IBM).

RESULTS

A total of 378 participants were involved in the study. The mean age of the participants was 53.98±14.64 years. Most of the participants were male, accounting for 56.3% of the sample. Over 90% of the participants were literate, with varying levels of education as detailed in Table 1. The majority of participants had comorbidities and more than 80% were in the age group above 40 years. The body mass index ranges from 18.61 kg/m^2 to 33.78 kg/m^2. One-third of the participants were having vegetarian diet.

Among cardiovascular drugs, the most commonly prescribed class was statins, followed by anti-platelets, which were each prescribed in over 90% of cases. Antibiotics and proton pump inhibitors were the most frequently prescribed non-cardiovascular drugs. Details about the classes of drugs prescribed are provided in Table 2.

Table 3 presents the Health-Related Quality of Life scores as mean±standard deviation. The scores vary from 0 to 100, where higher scores reflect an improved health-related quality of life. The highest total score was for general health (80.38±59.30), followed by physical functioning (75.45±22.51). Limitations in daily activities due to physical health were scored at 31.55±22.49, while emotional problems had a score of 36.07±27.17. Scores for energy/fatigue, emotional well-being and pain were approximately half of the maximum possible score, as shown in Table 3.

To find out the determinants of quality-of-life scores in a hospital setting, we utilized multiple linear regression model to assess the contribution of age, BMI, gender, co-morbidity and education level. The overall fit of the model was statistically significant F (9,368)=2.73, p=0.004). However, adjusted R2 value of 0.06 suggests that only 6% of variability in quality-of-life score is explained by included determinants. Only education level was associated with quality-of-life score in our model. Graduate level of education is associated with 9.366 point increase in quality of

Table 1: Demographic details of the participants.

Parameters	Frequency (%)
Gender	
Male	213 (56.3%)
Female	165 (43.7%)
Age (Years)	
18-40	65 (17.2%)
40-60	179 (47.4%)
60-80	122 (32.3%)
>80	12 (3.2%)
Education Level	
Illiterate	31 (8.2%)
Primary	106 (28.0%)
Secondary	123 (32.5%)
Higher Secondary	89 (23.5%)
Graduate	19 (5.0%)
Post-Graduate	10 (2.6%)
Comorbidities	
Yes	251 (66.4%)
No	127 (33.6%)
Diet	
Vegetarian	79 (26.46%)
Mixed	299 (73.54%)

Table 2: Classes of drugs prescribed.

Name of Drug Class	Frequency (%)
Cardiovascular	
Statins	363 (96.0%)
Antiplatelets	348 (92.1%)
ACE Inhibitors	269 (71.2%)
Diuretics	250 (66.1%)
Nitrates	220 (58.2%)
Anticoagulants	167 (44.2%)
Beta Blockers	137 (36.2%)
Calcium channel blockers	106 (28.0%)
Angiotensin receptor blockers	61 (16.1%)
Non-Cardiovascular	
Antibiotics	333 (88.1%)
Proton pump inhibitors	318 (84.1%)
Antidiabetics	84 (22.2%)
Non-steroidal anti-inflammatory drugs	31 (8.2%)

Table 3: Health Related Quality of Life score of participants.

SF-36 Domains	Female (Mean±SD)	Male (Mean±SD)	*p*-Value	Total (Mean±SD)
Physical functioning.	75.70±22.57	75.26±22.52	0.85	75.45±22.51
Role limitations due to physical health.	33.33±25.05	30.16±20.24	0.17	31.55±22.49
Role limitations due to emotional problems.	36.36±25.19	35.84±28.67	0.85	36.07±27.17
Energy/fatigue.	51.64±19.52	52.77±20.62	0.58	52.27±20.13
Emotional well-being.	53.67±32.08	56.26±32.26	0.43	55.13±32.17
Social functioning.	42.79±13.90	44.14±13.27	0.33	43.55±13.55
Pain	49.06±31.19	49.31±30.15	0.93	49.20±30.57
General health.	86.07±65.24	75.97±54.00	0.10	80.38±59.30
Overall Quality of life score.	53.07±14.57	52.10±14.17	0.51	52.52±14.35

life scores followed by Higher secondary with 6.964point increase in quality of life scores as shown in Table 4.

DISCUSSION

In a sample of Indian adults, the analysis revealed that overall HRQoL declined to approximately half and mostly decreased in the domain of limitation due to physical health and emotional problem and social functioning. Notably, the physical functioning and general health score were above 75 which indicate slight decline in HRQoL among patients with dyslipidemia. The findings of the results can be considered in following two points 1) low scores in role of limitations due to physical health, role of limitations due to emotional health, social functioning domain 2) age and educational levels as predictors for HRQoL.

Previous studies (Du *et al*., 2023; Park *et al*., 2019) have reported lower Health-Related Quality of Life among patients with

Table 4: Predictors for quality-of-life score.

Predictors	Unstandardized Coefficients		Standardized Coefficients	*t*	*p*-value
	B	Std. Error	Beta		
Age	-0.178	0.051	-0.181	-3.514	<.001
BMI	-0.268	0.232	-0.059	-1.158	0.248
Comorbidities (Yes)	2.029	1.553	0.067	1.307	0.192
Gender (Female)	1.469	1.503	0.051	.978	0.329
Primary Education	6.180	2.872	0.194	2.152	0.032*
Secondary Education	6.309	2.837	0.206	2.224	0.027*
Higher Secondary Education	6.964	2.931	0.206	2.376	0.018*
Graduate Education	9.366	4.103	0.143	2.283	0.023*
Postgraduate Education	5.094	5.120	0.057	0.995	0.320

dyslipidemia, consistent with our findings. Specifically, this includes role limitations due to physical health, emotional health, social functioning and pain. This finding corroborates the study conducted by Aikaterini Chatzinikolaou *et al.* in a Greek city (Chatzinikolaou *et al.*, 2021). We found that role limitations due to physical health and emotional health had the lowest mean scores for HRQoL. This may be attributed to comorbid conditions associated with dyslipidemia, reduced exercise tolerance due to high lipid levels, concerns about individual health and stress.

Our results are similar to those of a study conducted on 457 elderly Chinese patients with dyslipidemia, where pain or discomfort were reported to be high (Du *et al.*, 2023). This may be attributed to inflammation caused by elevated lipid levels, the use of statins, or atherosclerosis, which can lead to chest pain.

There was no significant difference in overall Health-Related Quality of Life (HRQoL) between males and females. When comparing the individual domains of HRQoL by gender, there was no significant difference in the mean scores. In contrast to our study, various study reported a worsened general health domain for women compared to men (Prata *et al.*, 2016; Norris *et al.*, 2008).

The multiple linear regressions showed that the education levels were positively correlated with HRQoL whereas age is negatively correlated. The results of this study are similar to those of the research conducted by Mengran Zhang *et al.*, which focused on myocardial infarction combined with dyslipidemia. This similarity may be attributed to the shared characteristics of the Asian population in both studies. Similarly, health related quality of life was poor in community older adults in Sri Lanka (Damayanthi *et al.*, 2018). Body mass index was not significant in our study. In contrast to our study, BMI was associated with decreases in HRQoL, as reported by Jacqueline Müller-Nordhorn *et al.* This discrepancy may be due to the differences in population, as her study focused on obese older women, while ours involved adults. Several studies have examined the influence of educational level on health-related quality of life. In our study, educational level was found to be a positive predictor of HRQoL, except for the postgraduate level. This exception may be due to a smaller sample size in that specific category.

Our study has limitations. It included only hospitalized dyslipidemia patients from a single center. As a cross-sectional study, it cannot establish a temporal relationship between the predictors and the outcomes also constitutes subjective bias in the response. However, a key strength of the study is its larger sample size.

CONCLUSION

In summary, the overall Health-Related Quality of Life of patients with dyslipidemia is good. However, limitations in physical health, emotional health, social functioning and the pain domain were scored low. Age, as well as primary, secondary, higher secondary and graduate educational levels, were significant predictors of HRQoL. Future studies should focus on assessing the interventions that help overcome limitations in physical health, emotional health, social functioning and pain/discomfort.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

HRQoL: Health-Related Quality of Life; **SF-36:** 36-Item Short Form Survey; **ASCVD:** Atherosclerotic Cardiovascular Disease; **IHD:** Ischemic Heart Disease; **LDL-C:** LDL Cholesterol; **SF-12:** 12-Item Short Form Survey, **WHOQOL-100:** World Health Organization Quality of Life; **WHOQOL-BREF:** World Health Organization Quality of Life Brief; **FACT-G:** Functional Assessment of Cancer Therapy-General; **EQ-5D-5L/EQ-5D:** European Quality of Life Instrument; **HUI:** Health Utility Index; **ACE Inhibitors:** Angiotensin Converting Enzyme Inhibitors; **BMI:** Body Mass Index.

ETHICAL APPROVAL

It is a part of a randomized controlled trial titled "Impact of pharmacist's intervention on lipid profile in patients treated for dyslipidemia in a tertiary care hospital-A randomized controlled study." The ethical committee of KLE Academy of Higher Education and Research (KAHER), Belagavi (Ref. No.: KAHER/EC/20-21/001/8), approved the study. The trial was registered with the clinical trial registry of India (Reg. No: CTRI/2020/12/030065). Written informed consent was taken from all the participants.

AUTHOR CONTRIBUTIONS

MSG and RB conceived and designed the study. RB was involved in the conduct of the study and data collection. MSG supervised the study. RB provided statistical advice on study design and analysed the data; MSG chaired the data oversight committee. RB drafted the manuscript and MSG contributed substantially to its revision. RB takes responsibility for the paper as a whole.

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