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Medication adherence and quality of life among patients with chronic obstructive pulmonary disease of a tertiary-level hospital

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ABSTRACT

Introduction: Chronic Obstructive Pulmonary Disease is estimated to rank as the third biggest cause of mortality globally, which lowers their quality of life. It is poorly understood how Chronic Obstructive Pulmonary Disease affects quality of life in relation to medication adherence. Therefore, this study aimed to identify medication adherence and quality of life among patients with Chronic Obstructive Pulmonary Disease in Nepal.

Methods: A descriptive cross-sectional study was carried out among 96 COPD patients attending at a tertiary hospital in Kathmandu, Nepal. A non-probability convenience sampling technique was used to select patients. A face-to-face interview was conducted using the Nepali validated General Medication Adherence Scale and Saint George's Respiratory Questionnaire (SGRQ-C). Data were analyzed using descriptive statistics like mean, frequency, standard deviation and percentage along with inferential statistics: Pearson correlation coefficient.

Results: 84.4% had high medication adherence. The mean QOL score was 38.87 ±12.79. The domains of quality of life were symptom 39.07 ±23.10, activity 62.75 ±21.67, and impact 24.60 ±16.79, indicating limitations in quality of life across the SGRQ-C domains.

Conclusion: The majority of patients with COPD had a high level of medication adherence. Daily activities of Chronic Obstructive Pulmonary Disease patients were more affected. No statistically significant differences were found between medication adherence and quality of life. This highlights the need for behavior modification for COPD patients.

Keywords: Chronic Obstructive Pulmonary disease, Medication Adherence, Patients, Quality of life

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable, and treatable disease characterized by persistent respiratory symptoms and airflow limitation.[1] Globally, chronic obstructive pulmonary disease is the third leading cause of death, causing 3.23 million deaths in 2019. In Nepal, COPD accounts for 43% of the non-communicable disease burden and 2.56% of hospitalizations.[2] Medication adherence is an important factor in disease management.[3] Numerous studies have demonstrated that medications improve clinical outcomes and reduce disease, disability, and mortality.[4,5] Medication non-adherence is common in COPD, which impairs the health-related quality of life (HRQoL) markedly; patients experience substantial limitations in their daily lives. Worse QOL in COPD is associated with many factors such as sex, severity of disease, smoking status, presence of comorbidities, number of exacerbations, and hospital admissions.[6,7]

Medication adherence is an aspect that frequently impacts the HRQoL of patients receiving long-term therapy. The chronic nature of the disease and periodic remission of symptoms also contribute to increased risk of adherence issues in patients with COPD.[8] Non-adherence rate in COPD has been estimated to be more than 50%.[9] Although various aspects of medication adherence and quality of life have been studied in COPD patients, little is known about the relationship between medication adherence and HRQoL.[10]

This study aimed to identify medication adherence and quality of life among patients with COPD at Kathmandu Medical College and Teaching Hospital (KMCTH), Kathmandu, Nepal. Also, our study will help with early detection, plan interventions needed to help patients adhere to medication and improve the quality of life of COPD patients.

METHODS

A descriptive cross-sectional study was conducted at the medical OPD of KMCTH to assess medication adherence and quality of life among patients with COPD. Data were collected from 9th July to 11th August, 2023. KMCTH was chosen because it is one of the Tertiary care centers in Kathmandu and has a high case flow.

Patients who were clinically diagnosed to have COPD for at least 6 months and attending the medical OPD of KMCTH were included in the study using a convenience sampling technique. Severely ill patients with COPD were excluded. A non-probability convenience sampling technique was used. A face-to-face interview technique was used. The sample size was calculated as follows:

$n=z^2pq/e^2$ where, z= critical value for 95% confidence limit i.e., 1.96. p= prevalence rate i.e. 50% by assumption of the researcher. Thus, p value=0.5 for this study. q=1-p=1-0.5=0.5 and e= permissible error, value of e= 10% i.e.; 0.1. Using this formula, n = 96.04, so the sample size was 96.

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Medication Adherence was assessed using the standard Nepali version tool "General Medication Adherence Scale" (GMAS). An English version of GMAS was translated into Nepali to measure medication adherence among patients with chronic illnesses.[11] The Nepali version of the General Medication Adherence Scale (GMAS) was developed after obtaining permission from the original authors. The questionnaire underwent two independent forward translations into Nepali, which were reconciled into a single version, followed by backward translation into English to ensure conceptual equivalence. The interim Nepali version was proofread and pilot-tested with patients, and feedback from both patients and experts was incorporated to finalize the Nepali version of the GMAS.

The self-report GMAS consisted of 11 questionnaires divided into three categories. Patient Behavior-related Non-Adherence (PBNA) contains five questions, Additional Disease and Pill Burden-related Non-Adherence (ADPB) contains four questions, and Cost-related Non-Adherence (CRNA) contains two questions. A Likert scale labeled as "Always", "Mostly", "Sometimes", and "Never" was used to measure the response to the questionnaires. The reliability score for GMAS is Cronbach's alpha 0.82.

Grading for overall medication adherence.12 High adherence = 30-33, Good adherence = 27 – 29, Partial Adherence = 17 – 26, Low Adherence = 11 – 16, Poor Adherence = 0 – 10.

Health-related quality of life was assessed using the standard St. George's Respiratory Questionnaire (SGRQ).13 The St. George's Respiratory Questionnaire (SGRQ) was adapted into Nepali through a standard cross-cultural translation procedure. This process involved independent forward translations by bilingual experts, reconciliation of the translated versions, back-translation into English, and reviewed to maintain the original meaning of the items. The Nepali version was then pilot tested among COPD patients to ensure clarity and cultural suitability, and its validity was assessed by evaluating its ability to distinguish between individuals with and without COPD and by examining its association with lung function parameters. It was a standardized disease-specific instrument designed to measure impact on overall health, daily life, and perceived well-being in patients with obstructive airway disease.

The SGRQ-C is a shorter version derived from the original version [St. George's respiratory questionnaire (SGRQ)] following a detailed analysis of data from large studies in COPD. It contained 40 items compared with the original 50, with 76 weighted responses that covered three domains: Part 1: Symptoms component (frequency and severity), Part 2: Activity component (activities that cause or are limited by breathlessness), and Part 3: Impact component (social functioning, psychological disturbances resulting from airway disease).

In addition to the domain scores, a total score was calculated. Each item had an empirically derived weight. Scores range from 0 to 100, with higher scores indicating more limitations. A total score of 100 indicated poor health status, while a score of 0 indicated the best.

A Total and three-component scores were calculated: Symptoms, Activity, and Impacts. Each component of the questionnaire was scored separately. Symptoms component (This consisted of all the questions in Part 1. The weights for Questions 1-7 were summed. A single response was required to each item.), Activity component (This was calculated from the summed weights for the positive responses to items. Questions 9 and 12 in Part 2 of the questionnaire.), and Impacts component (This was calculated from Questions 8, 10, 11, 13, 14 in Part 2 of the questionnaire.)

The score for each component was calculated separately by dividing the summed weights by the maximum possible weight for that component and expressing the result as a percentage:

Score = (Summed weights from all positive items in that component)/(Sum of weights for all items in that component) x 100

The Total score was calculated in a similar way:Score = (Summed weights from all positive items in the questionnaire)/(Sum of weights for all items in the questionnaire) x 100

Sum of maximum possible weights for each component and Total: Symptoms 566.2, Activity 982.9, Impacts 1652.8. Total (sum of maximum for all three components) 3201.9.

Data completeness was checked, and the data were entered into SPSS version 20 for statistical analysis. Descriptive statistics, including frequency, percentage, and inferential statistics, including the Karl Pearson Correlation Coefficient, were used to analyze the data. Ethical clearance was obtained from the Institutional Review Committee (IRC) of KMCTH (IRC Ref no. 2022/36) before commencing the study.

RESULTS

The total number of patients included in the study was 96. Most patients were older adults, with nearly 72% aged over 60 years (mean age 67.36 ± 12.82 years), and a slight male predominance (54.2%). Educational levels varied, with over 40% being illiterate and about 28% able to read and write. The largest occupational group was retirees (40.6%), followed by homemakers (37.5%). The majority had a disease duration of more than 10 years (80.2%). Heart disease was the most common comorbidity, affecting nearly half of the patients (46.9%). A large proportion were former smokers, with varied durations since quitting. Medication duration varied, with over half having used treatment for less than five years. (Table 1)

Table 1: Socio-demographic Characteristics of Respondents (n=96)

Characteristics	Frequency	Percentage
Age (in years)		
>60	69	71.9
<60	27	28.1
Mean age ±SD 67.36 ± 12.82		
Gender		
Male	52	54.2
Female	44	45.8
Education		
Illiterate	41	42.7
Can read and write	27	28.1
Secondary	16	16.7
Basic level	7	7.3
Higher secondary	5	5.2
Occupation		
Retired	39	40.6
Homemaker	36	37.5
Agriculture	9	9.4
Business	7	7.3
Service	3	3.1
Others	2	2.1
Duration of illness (in years)		
<10	77	80.2
>10	19	19.8
Comorbidity		
Heart disease	45	46.9
Diabetes	18	18.8
Thyroid	8	8.3
Smoking status		
Former smoker	67	69.8
Never smoker	25	26.0
Current smoker	4	4.2
Duration of quitting smoking		
<10	36	37.5
>10	31	32.3
Mean duration quitting smoking 11.73±9.913		
Fuel used for cooking		
LPG gas	87	90.62
Wood	32	33.33
Years of medication		
<5	59	61.5
>5	37	38.5

The majority of the patients (84.4%) had a high level of medication adherence, and only 5.2% had a partial level of medication adherence. (Table 2)

Table 2: Medication adherence of respondents (n= 96)

Level of Medication Adherence	Frequency	Percentage
High Adherence (30-33)	81	84.4
Good Adherence (27-29)	10	10.4
Partial Adherence (17-26)	5	5.2

The highest mean score was observed in the activity domain, indicating greater limitations in physical activity, followed by symptom and impact scores. The total score reflects the overall quality-of-life impairment in this patient group. (Table 3)

Table 3: Domains of quality of life of COPD patients (n= 96)

Component	Mean (Standard Deviation)
Activity Score	62.75 ± 21.67
Symptom Score	39.07 ± 23.10
Impact Score	24.60 ± 16.79
Total Score	38.87 ± 12.79

A negative relationship between medication adherence and QOL score was seen. No significant impact of medication adherence on quality of life was revealed. The significance value (p) = 0.23, which indicates no significant relationship between medication adherence and quality of life. (Table 4)

Table 4: Correlation between medication adherence and quality of life (n= 96)

Variables	r value	p-value
Medication adherence	-0.12	0.23
Quality of life score		

Pearson correlation: P significant at <0.05 level.

DISCUSSION

This cross-sectional study found a high level of medication adherence among COPD patients, consistent with previous research conducted in Nepal in 2016 and Slovenian patients in 2018.[14,15] In contrast, a study from Nepal in 2015 reported low medication adherence, which may be attributed to limited patient awareness about the importance of COPD medication.[16]

The study also demonstrated impaired quality of life across all domains of the St. George's Respiratory Questionnaire (SGRQ), with the activity domain being most affected and the impact domain least affected. These findings align with studies by Farag TS in Egypt in 2018 and by Horvat et al. in Slovenia in 2018.[8,17] However, the results differ from those of a 2021 study conducted at a tertiary care hospital in Kavre, Nepal, in which the symptom domain was most affected.[18] Such variations may be related to differences in patient age and family literacy levels.

The mean total SGRQ score in this study is comparable to that reported in Slovenia but contrasts with findings from Kavre, Nepal, potentially due to differences in patients' health status, reliance on firewood for cooking, and smoking habits.[8,17] Furthermore, no significant correlation was observed between medication adherence and quality of life in this cohort, consistent with findings from Slovenia and Hungary in 2011.[8,17] Conversely, a study conducted in Japan reported a significant relationship between these variables.[19]

CONCLUSION

This study, conducted at Kathmandu Medical College and Teaching Hospital, revealed that the majority of patients with COPD had high medication adherence and impairment in the activity domain of quality of life. There were statistically significant differences in QOL score based on educational and comorbid status. This study showed that education and comorbidity differed significantly in QOL scores. Hence, further study can be conducted on patients' health education levels to make them aware of the importance of medication and to improve their daily activities. More efforts must be directed to decrease hospital admissions, with special attention to patients with comorbidities.

DECLARATIONS

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Author Contributions

SM and AM developed the research concept. SM contributed to the design of the research.SM performed the literature search. SM carried out data collection. Data analysis was performed by SM and AM; similarly SM, and AM undertook data interpretation.SM drafted the manuscript.SM and AM performed a critical review of the manuscript for important intellectual content.SM gave final approval of the version to be submitted. All authors, including SM and AM, agreed to be accountable for all aspects of the work.

Ethical Approval

This research was approved by IRC Kathmandu v with the reference number 2022/36 on 30 September 2022.

Consent/Assent

Prior to data collection, informed consent was obtained from each participant. The privacy and confidentiality of the information were maintained throughout the research process. Informed written consent was obtained from all the participants before data collection.

Data Availability Statement

The data that support the findings of this study are available on request to the corresponding author

Conflicts of Interest

There are no conflicts of interest to disclose.

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