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Adherence to medications in patient with Chronic Obstructive Pulmonary Disease (COPD) attending outpatient department

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Abstract

Introduction: Medication adherence is crucial for optimal health outcomes in Chronic Obstructive Pulmonary Disease (COPD). Non-adherence contributes to acute exacerbations, repeated hospitalizations, poor quality of life, increased healthcare costs, and higher morbidity and mortality. The objective of this study was to assess the level of adherence to medication among patient with COPD attending outpatient department (OPD) of Patan Hospital, Nepal.

Method: A cross-sectional analytical study conducted in Medical OPD of Patan Hospital from 2019 Sep 1 to Nov 9. A total of 240 patients with COPD were selected using purposive sampling technique. Data were collected through face-to-face interview with a structured questionnaire that included patient characteristics and the standardized Morisky Green Levine Medication Adherence Scale. Data were analysed using descriptive statistics and chi-square test for association. Ethical approval was obtained from the Institutional Review Committee of Patan Academy of Health Sciences.

Result: Among 240 respondents, 31.25% demonstrated high adherence to medication, 48.8% had medium adherence and 20% had low adherence. A significant association was observed between route of medication administration and level of adherence (p=0.020).

Conclusion: Only about one-third of COPD patients had high adherence to medication. Programs to improve adherence should consider factors influencing patient behaviour, particularly the route of medication administration, to reduce exacerbations and improve health outcomes.

Keywords: Chronic Obstructive Pulmonary Disease; Medication Adherence; Nepal; Outpatients

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Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a fourth leading cause of morbidity and mortality worldwide, posing an economic and social burden.[1] It is a preventable and treatable disease characterized by persistent respiratory symptoms and airflow limitation, most often caused by long-term exposure to noxious particles or gases.[2] Globally, prevalence continues to rise and varies across countries, with an estimated prevalence of COPD is 6.2% in the Asia-Pacific region.[3]

Mediation adherence is essential to optimize outcomes in COPD. Non-adherence is common, leading to recurrent exacerbation, increased hospitalizations, reduced quality of life, higher healthcare costs, and greater morbidity and mortality.[4] Non-adherence may be unintentional, such as forgetfulness, difficulty understanding instructions, poor vision, or inability to purchase medicines, or intentional, when patients discontinue treatment after symptomatic relief, fear of side effects, or take incorrect doses.[5]

Studies worldwide show varying adherence patterns. In Portugal, 31.3% of patients showed poor adherence, while in Italy, 77.7% of patients demonstrated extremely poor adherence, associated with comorbidity and polypharmacy.[6,7] In India, adherence was low and has been associated with discontinuation of treatment once symptoms improve, limited access to health services, and economic constraints.[8,9] In Nepal, adherence rate ranges from 28.9% to 83% with forgetfulness, side effects, and polypharmacy identified as major contributors.[10,11,12]

Improving adherence is crucial, as poor compliance worsens disease outcomes, increases healthcare use. Despite this, evidence from outpatient settings in Nepal remains sparse. Therefore, this study aims to assess the level of medication adherence among COPD patients attending the outpatient department at Patan Hospital.

Method

A quantitative cross-sectional analytical study was conducted from 2019 Sep 1 to Nov 9 in Patan Hospital, Lalitpur, Nepal. All the adult patients diagnosed with Chronic Obstructive Pulmonary Disease (COPD) attending the Medical Outpatient Department (OPD) of Patan Hospital were taken as a study population. A total of 240 samples for the study were selected by using a non-probability purposive sampling technique. Those patients who came for their follow-up visit in the medicine OPD during a six-week period, met the study inclusion criteria, and willing to participate in the study were selected as the study sample.

Data was collected after administrative approval was received from the Research Committee of the School of Nursing and Midwifery, Lalitpur Nursing campus (LNC). Ethical approval for the study was obtained from the Institutional Review Committee (IRC) of Patan Academy of Health Sciences (PAHS) (Ref: PNA1907091267). Also, the permission was taken from the Head of the Department of Medicine and OPD in charge of Patan Hospital.

Each day, around 20 patients visit the Medical OPD for COPD treatment. Among them, eight patients were selected based on the inclusion criteria of the study. Also, the patient's file and the patient him/herself was used for the confirmation of the diagnosis. Written informed consent was obtained from all participants using a generic PAHS format in Nepali. Data was collected by the face-to-face interview technique. A structured schedule in the Nepali language was prepared for the interview. The interview was conducted during the waiting time before the patient was seen by the doctor. The average time to complete the interview was about 15 minutes. Data was collected from 7:30 am to 4:30 pm except on Wednesday and Saturday.

The instrument used for data collection consisted of two sections, one with Patient's Sociodemographic Characteristics including age, gender, living status, affordability of medicine cost, duration of disease, duration of treatment, number of medicines per day, route for medication, information on medication by health care provider and family support for the treatment and another Morisky–Green–Levine (MGL) medication adherence tool was used to assess the level of medication adherence of COPD, a validated tool (Cronbach's alpha 0.61).[13] This tool was in open access. On the MGL scale, each item is scored as Yes = 0 and No = 1, yielding a total score between 0 and 4: a score of 0 indicates high adherence, scores of 1–2 indicate medium adherence, and scores of 3–4 indicate low adherence. In this study, three categorizations (high, medium, and low levels of adherence) were done to assess the level of medication adherence of COPD patients. But only two categorizations (high and low level of medication adherence) were done to assess the association between certain patient characteristics and level of medication adherence. For categorizing low adherence, the low and medium level of medication adherence score was merged.[13]

Data were collected through face-to-face interviews with a structured questionnaire and data were checked thoroughly for accuracy and completeness. Field editing was done for the accuracy of data. The collected data was edited, coded, and entered in Statistical Package for the Social Sciences (SPSS) version 20. Data were analysed using descriptive statistics (frequency and percentage) and Chi square

test to examine the association between patient characteristics and patients' level of medication adherence. A p value of <0.05 was taken as significant

Result

In this study, a total of 240 participants were included. Among them, most of the respondents were aged more than 65 years 161(67.08%), with a mean age of 71.92±33.50 years. Among them, more than half were female 152(63.33%), and 88(36.67%) were male. Likewise, most respondents were living with family 229(95.42%), and only a few were living alone 11(4.58%), Table 1.

Table 1. Socio-demographic characteristics of the participants (N=240)

Variables	n (%)
Age in years	
46–65	79(32.92%)
>65	161(67.08%)
Mean ± SD age (years)	71.92 ± 33.50
Gender	
Male	88(36.67%)
Female	152(63.33%)
Living status	
Living alone	11(4.58%)
Living with family	229(95.42%)

More than half of the respondents could not afford medicine themselves 147(61.25%). Similarly, more than half of the respondents had been suffering from COPD for more than six years 126(52.50%). Nearly half of the patients were receiving treatment for more than six years 112(46.67%), Table 2.

Table 2. Patient characteristics: affordability of medicine cost, duration of disease, duration of treatment (N=240)

Variables	n (%)
Affordability of medicine cost	
Yes	93(38.75%)
No	147(61.25%)
Duration of disease	
4 months – < 1 year	13(5.42%)
1 year – 3 years	56(23.33%)
4 years – 6 years	45(18.75%)
Above 6 years	126(52.50%)
Duration of treatment	
4 months – < 1 year	17(7.08%)
1 year – 3 years	66(27.50%)
4 years – 6 years	45(18.75%)
Above 6 years	112(46.67%)

Most of the respondents were taking more or equal to two medicines per day 195(81.25%). More than half of the respondents were taking medicine by the inhalation route 148(61.67%). Most of the respondents were getting information on medication from health care provider 232(96.67%), and most of the respondents were getting family support for treatment 229(95.42%), Table 3.

More than half of the respondents answered that they do not forget to take medicine 124(51.67%), and 133(55.42%) respondents answered that they

Table 3. Patient characteristics: number of medicines per day, route for medication, information on medication by health care provider and family support for the treatment (n=240)

Variables	n (%)
Number of prescribed medicines per day	
Less than two drugs	45(18.75%)
More or equal to two drugs	195(81.25%)
Route for medication	
Oral	6(2.50%)
Inhaler	148(61.67%)
Both	86(35.83%)
Information on medication by health care provider	
Yes	232(96.67%)
No	8(3.33%)
Family support for the treatment	
Yes	229(95.42%)
No	11(4.58%)

are careless at times about taking medicine. Similarly, most of the respondents did not stop medicine when they felt better 172(71.67%). Likewise, most of the respondents did not stop medicine even when they felt worse 210(87.50%), Table 4.

Table 4. Medication adherence based on the Morisky Green Levine (MGL) Medication Adherence Scale (N=240)

Variables	n (%)
Do you ever forget to take your medicine?	
Yes	116(48.33%)
No	124(51.67%)
Are you careless at times about taking your medicine?	
Yes	133(55.42%)
No	107(44.58%)
When you feel better do you sometimes stop taking your medicine?	
Yes	68(28.33%)
No	172(71.67%)
Sometimes if you feel worse when you take the medicine, do you stop taking it?	
Yes	30(12.50%)
No	210(87.50%)

Nearly one third of the respondents 75(31.25%) had high level of adherence whereas most 117(48.75%) had medium level of adherence, Figure 1.

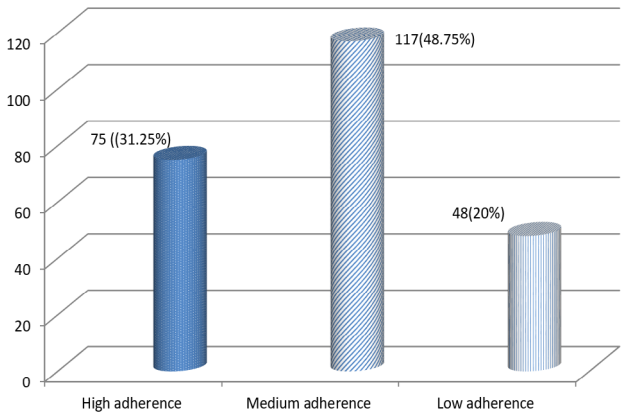

Figure 1. Patients' level of medication adherence according to MGL (N=240)

Table 5. Association between socio-clinical variables and level of medication adherence (N=240)

Variables	Low adherence n (%)	High adherence n (%)	p value
Age in years			
46–65	51(21.25%)	28(35.45%)	0.326
>65	114(47.50%)	47(29.19%)	
Affordability of medicine cost			
Yes	61(25.41%)	32(13.33%)	0.401
No	104(43.33%)	43(17.91%)	
Number of prescribed medicines per day			
<2 drugs	31(19.91%)	14(31.11%)	0.982
≥2 drugs	134(55.83%)	61(31.28%)	
Route for medication			
Oral	1(0.41%)	5(2.08%)	0.020*
Inhaler	104(43.33%)	44(18.33%)	
Both	60(25.00%)	26(10.83%)	
Information on medication by health care provider			
Yes	159(66.25%)	73(30.41%)	0.698
No	6(2.50%)	2(0.83%)	

*Level of significance at <0.05

There was an association between the route for medication and the level of medication adherence (p=0.020). While there was no significant association between age and level of medication adherence (p=0.326), affordability of medicine cost and level of medication adherence (p=0.401), number of prescribed medicines per day and level of medication adherence (p=0.982), and information on medication by health care provider and level of medication adherence (p=0.698), Table 5.

Discussion

The level of medication adherence was categorized into three groups that are high, medium and low adherence. Present study showed that 75(31.25%) respondents had high level of adherence whereas 117(48.75%) had medium level of adherence and 48(20.0%) had low level of medication adherence. This finding was consistent with the cross-sectional study done in Chitwan, Nepal among 120 respondents, it showed that 28.9% had high level, 55.4% had medium level and 15.7% had low level of medication adherence [10]

The present study showed that 161(67.08%) respondents belong to the age of more than 65 years. The mean age of the respondents was 69.72 years (±9.99). Similarly, more than half 152(63.33%) of the respondents were female.

Similarly, a descriptive study done in Pakistan 2018, among 120 respondents showed that only 28.45% had high level of medication adherence beside that 19.82% had medium level and 51.72% had low level of medication adherence.[14] Forgetfulness, fear of side effect, lack of family support, high cost of medicine, polypharmacy, feeling better and stopping medication, inadequate knowledge about drug are main reasons for low adherence to medications in COPD patients in Nepal, India, Pakistan and all over the world.

In contrast, the findings of the present study contradict the findings of a cross-sectional study conducted in Slovenia among 65 respondents, where the high level of medication adherence was 53.4%.15 This variation in results could be due to differences between the two countries, such as developed and developing nations. These findings emphasize the need to develop strategies like patient education, counselling, improved communication between healthcare workers and patients, reminders, etc., to enhance medication adherence in COPD. The present study showed that there is no statistically significant association between age and medication adherence (p=0.326). This result is consistent with a cross-sectional study done in Nepal in 2015, which revealed no significant association between age and the level of medication adherence, with a p-value of 0.661. However, the present findings are contradictory to a cross-sectional study conducted in Hungary in 2018, which revealed a significant association between age and medication adherence (p≤0.001). This discrepancy may be due to differences in study population characteristics, socioeconomic factors, healthcare access, or cultural beliefs and attitudes toward medication adherence between Nepal and Hungary.

The present study also showed that there is no statistically significant association between the number of prescribed medicines per day and medication adherence (p=0.982). This finding contradicts a study conducted in Nepal among 100 respondents in 2015, which showed that the number of prescribed medicines per day was associated with the level of medication adherence (p<0.001). Likewise, another study conducted in Dhulikhel, Nepal, among

100 respondents, showed a significant association between the number of prescribed medicines per day and medication adherence (p=0.01). These varied results may be due to differences in educational status and perceived behaviour of the respondents. Similarly, there was no significant association between the affordability of medicine costs and medication adherence (p=0.401). This finding is supported by a cross-sectional study done in Dhulikhel, Nepal, which showed no significant association between the affordability of medicine costs and proper knowledge of inhaler use with medication adherence (p=0.089, p=0.368). Additionally, a cross-sectional study conducted in Australia also showed no association between the affordability of medicine costs and medication adherence (p=0.351). It may be due to the health insurance system in Austria, but in Nepal, most people live with their families and are supported by family members. However, this result contradicts a previous study done in Nepal, where medication adherence was associated with the affordability of medicine costs and information provided by healthcare providers, with a p-value of 0.012. Likewise, a study conducted in Chitwan, Nepal, among 120 respondents in 2019, showed that the affordability of medicine costs was significantly associated with the level of medication adherence (p=0.02).

Furthermore, the present study didn't show a significant association between information provided by the health care provider and level of medication adherence (p=0.698). This study was supported by Chitwan, Nepal, showed no significant association between information about medication by health care providers and level of medication adherence, where p=0.63.[18] In contrast, a study conducted in Dhulikhel, Nepal, in 2015 revealed a significant association between information by health care providers and level of medication adherence (p=0.004).[11]

The present study showed that there is a significant association between the route for medication and the level of medication adherence (p=0.020). This finding was in contradiction with a previous study done in Nepal among 100 respondents, which showed that there was no significant association between route of medication and level of medication adherence (p=0.58).[12]

A major strength of this study is that it provides important baseline data on medication adherence among COPD patients in Nepal, where limited research has been conducted in this area. The study used a standardized and widely accepted tool (MGL medication adherence scale), which increases comparability with international studies. However, this study was limited to a single setting (Patan Hospital only). Pre-testing was not done for the reliability of the tool. Further comparative study could be conducted between rural and urban hospitals, and validation of the MGL medication adherence tool is recommended in the Nepali context.

Conclusion

The study findings revealed that nearly one-third of the respondents had a high level of medication adherence while nearly half had a medium level of medication adherence. Route of medication was significantly associated with level of medication adherence among COPD patients. However, age, affordability of medication cost, number of prescribed medicines per day and information on medication by health care provider were not associated with level of medication adherence. The main reasons for low adherence to medications were forgetfulness to take medicine and carelessness.

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Conflict of Interest

None

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Author Contribution

Concept, Design, planning, data collection/ analysis, draft manuscript, final manuscript, accountability of the work: NR.

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