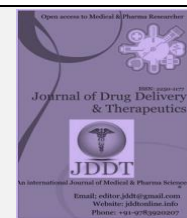
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Research Article

Assessment of Medication Adherence Barriers in COPD Patients in A Secondary Care Teaching Hospital

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ABSTRACT

Background: COPD is characterised by persistent airway obstruction in which better clinical outcome can be attained by appropriate management of disease. Adherence to COPD medication is poorly understood due to chronic nature of the disease. It is crucial to identify the barriers of non-adherence to build up and execute policies and interventions to upgrade medication adherence. **Objective:** To identify the predisposing barriers of medication adherence and to find the association between medication adherence and variables. **Methods:** A descriptive analytical study was conducted and data was collected from COPD outpatients. The Morisky Medication Adherence Scale was used to measure adherence and self-assessed questionnaire was employed to identify the predictors of poor adherence. Chi square test was carried out to find the relationship between medication adherence and variables such as age, gender, literacy, socioeconomic class, polypharmacy, delivery device and climate. **Results:** A total of 403 patients were involved in the study where 68% reported lower adherence. The most common adherence barriers found were forgetfulness (88%), intentional stoppage of medicines when symptoms improve (83%) and negligence towards medication (82%). A significant association was found between gender, literacy, socioeconomic class, polypharmacy, delivery device and climate. **Conclusion:** Adherence to medication regimen in COPD patients is poor, even though it is a preventable and a treatable disease. Well-structured education, training, counseling is required to overcome medication adherence particularly among illiterate and low socioeconomic class patients. The combined interventions should be used such as video clips demonstrations of inhaler technique should be given.

Keywords: COPD, Morisky medication adherence scale, Chi square test.

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INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) characterizes an imperative general health challenge and is the main reason for morbidity and mortality all throughout the world. In 2012, a total of 6% deaths were reported globally because of the disease. In coming years, COPD liability is projected to expand due to constant exposure to predisposing factors. As of now, it is the fourth driving reason for death in the world yet is anticipated to be the 3rd prominent reason for death by 2020.

In 2003, World Health Organization's (WHO) Adherence Project defines adherence as "the extent to which a person's behavior (taking medication, following a diet, and/or executing lifestyle changes) corresponds with agreed recommendations from a healthcare provider".⁽¹⁾ As per WHO, patients who were on long term treatment have shown 50% or less adherence. COPD patients exhibit remarkably poor adherence to treatment than asthmatic patients.⁽²⁾

Underuse, overuse, improper use are the three typical forms of medication non-adherence.

In order to implement newer policies and disease management strategies to enhance medication adherence and clinical outcomes, there needs a minimum recognition of medication adherence barriers.⁽³⁾

The intention of this study is to identify some of the essential perspectives influencing adherence to medication and to distinguish certain indicators of poor adherence in COPD patients.⁽²⁾

METHODOLOGY

A descriptive analytical study was carried out in the outpatient department of KCG hospital, from October 2018 to March 2019. Stable patients more than 40 years old and analysed as COPD as indicated by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria were consecutively incorporated into the research. Patients with

psychiatric disorder and those who are not willing to participate were not included in the study. The total number of COPD patients participated in the study was 403. All participants handed out their written informed consent and the study was ratified by the Ethics Committee of KLECOP. A self-assessed questionnaire on adherence barriers in patients was carried out and validated with an indicated Cronbach's alpha of 0.74. It comprises of 16 items in the questionnaire, depicting the determinants of medication non-adherence. Adherence was assessed using Morisky Medication Adherence Scale which is a 4 item questionnaire where the scoring pattern of 'Yes' = 0 and 'No' = 1 was used. The summary score of the MMAS ranges from 0 - 4, in which higher scores show more noteworthy adherence. Economic and sociologic conditions were measured using Kuppusswamy socioeconomic scale, holding the education and occupation of the head of the family which gives the socioeconomic status of the patients. Association between medication adherence and the variables were then analysed.

RESULT

Out of 403 patients participated in the study, there were more male patients (59 %) than females (41%). The mean age of patients was 63.13 years and greater number of patients belonged to age group of 61-70 years (36%). In this study 64% of respondents were observed with cigarette

smoking. The proportion of literate patients were significantly higher (67%) compared to illiterate patients (33%). Most were identified in the upper lower (42.7%) socioeconomic class followed by lower middle (25.5%), lower (18.62%) and upper middle (13%) socio economic class. Also 257(64%) were administered with multiple medications. Furthermore, 47 % of the population used inhalers, 32 % used nebulizers while 21% were found to be using only oral medications.

Adherence pattern of 403 patients were measured using Morisky Green Levine Scale and it was found that 274 (68%) were non adherent while 129 (32%) were adherent to the prescribed treatment. According to self-reported questionnaire among 274 non-adherent patients, the most common cause of non-adherence found were forgetfulness (88%) and intentional stoppage of medication use (83%) when the symptoms improve. Other reasons include negligence towards medication (82%), polypharmacy (56%), lack of family support (53%), delay of medication refill from pharmacy (48%), refusal of medication use in public (42%). Chi-square test was employed to analyse the association among adherence and variables where gender, literacy, socioeconomic status, polypharmacy, delivery device of inhaled medication and climate showed significant association. However there was no association found with age groups ($p=0.860$)

Variable	Total (n)	Adherent (n=129)	%	Non-adherent (274)	%	p-value
Age groups(years)						
40-50	33	10	30	23	70	0.860
51-60	116	39	34	77	66	
61-70	147	49	33	98	67	
71-80	107	31	29	76	71	
GENDER						
Male	238	61	26	177	74	0.001
Female	165	68	41	97	59	
LITERACY						
Literate	269	109	41	160	59	0.001
Illiterate	134	20	15	114	85	
Socioeconomic classes						
Lower	75	13	17	62	83	0.001
Upper lower	172	47	27	125	73	
Lower middle	103	43	42	60	58	
Upper middle	53	26	49	27	51	
Polypharmacy						
Non-polypharmacy	146	79	54	67	46	0.001
Polypharmacy	257	50	19	207	81	
Delivery devices						
Inhaler	191	86	45	105	55	0.001
Nebuliser	127	24	19	103	81	
No nebulisation or inhaler	85	19	22	66	78	

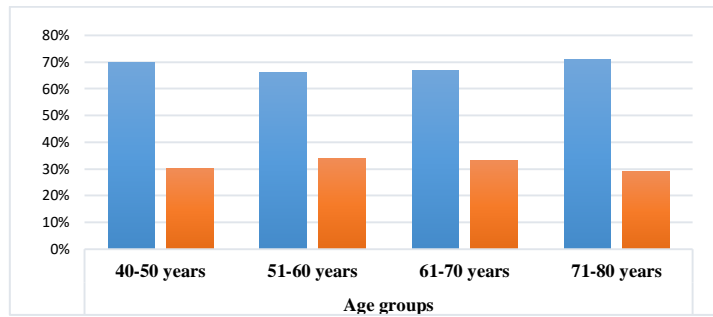


Fig 1: Adherence pattern among age group

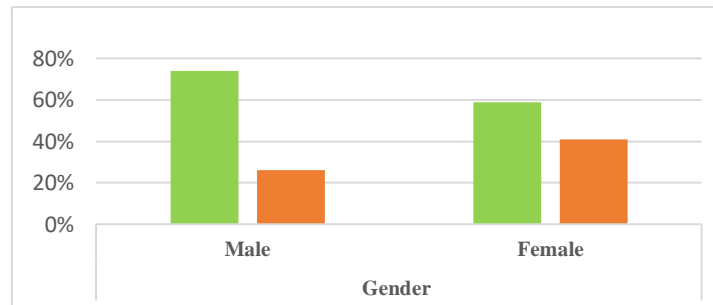


Fig 2: Adherence pattern among gender

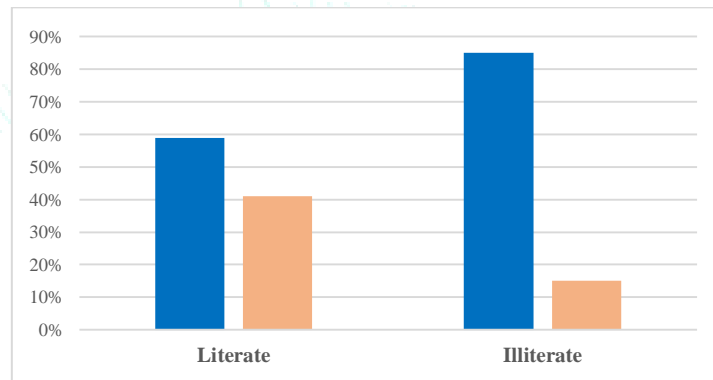


Fig 3: Adherence pattern among literate and illiterate patients

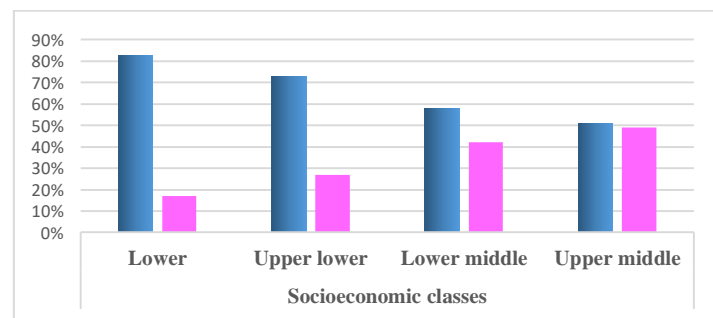


Fig 4: Adherence pattern among socioeconomic classes

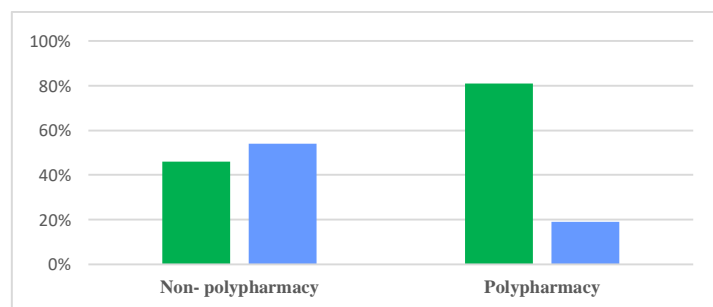


Fig 5: Adherence pattern among polypharmacy and non-polypharmacy patients

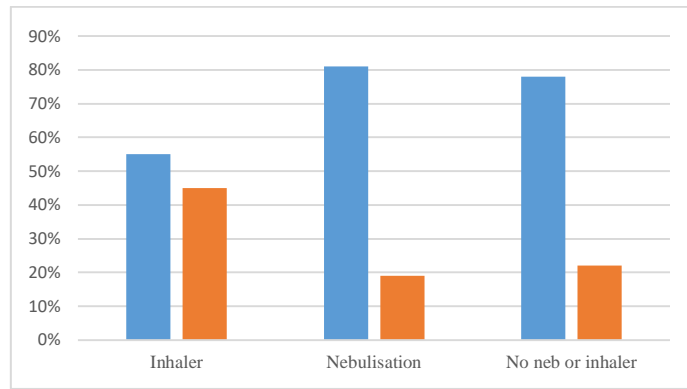


Fig 6: Adherence pattern of medication delivery devices

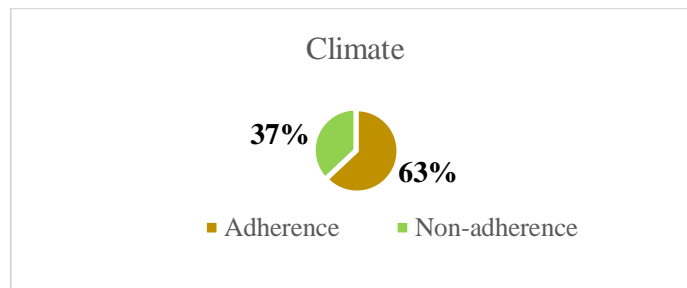


Fig 7: Adherence pattern in relation to climatic conditions.

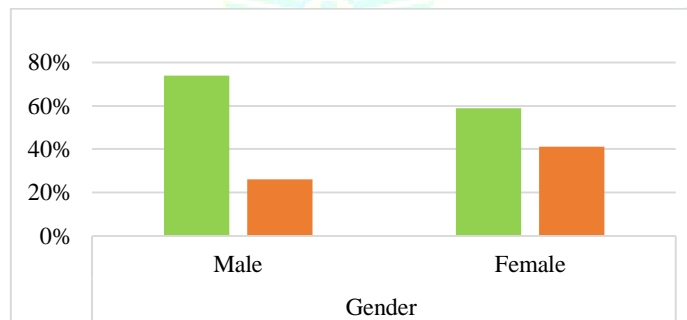


Fig 8: Adherence pattern among gender

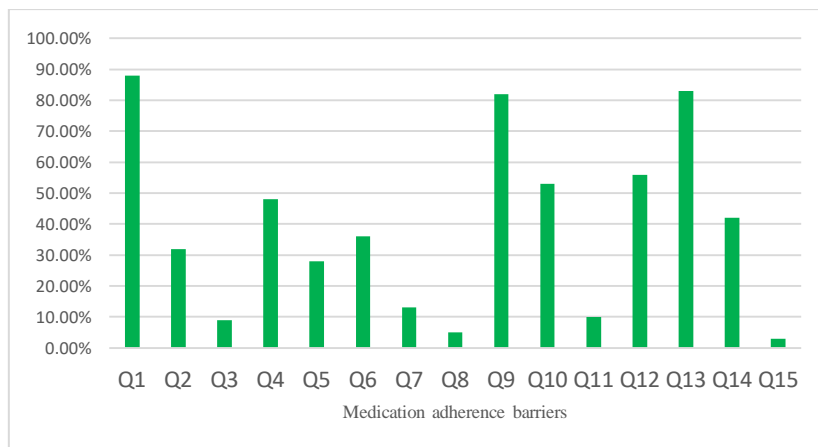


Fig 9: Percentage of medication adherence barriers

DISCUSSION

Poor adherence to medications often results in increased frequency of exacerbations and mortality among COPD patients.⁽⁴⁾ In this study with 403 patients, 32% were reported adherence to COPD medications while 68% reported non adherence which was inconsistent with the study by T Agh *et al* who reported 58.2% of adherence.⁽⁵⁾ A significant association was found between adherence and variables such as gender, literacy, polypharmacy, socioeconomic status, delivery devices of inhaled medications and climate. A higher incidence of COPD was found in the age group of 60-70 years. According to WHO, the occurrence of COPD is common after the age of 40 years and increases proportionally with age increments⁽⁶⁾ Among the considered age groups, non-adherence was greater in 70-80 years (71%) which is arguably due to forgetfulness, cognitive impairments, complex treatment regimen, lack of family support, depression, strong sense of loss and feelings of hopelessness.⁽⁷⁾

Our study showed association between gender and adherence as similar to previous studies.^(8,9,10) Alcohol consumption, smoking, busy schedules, less concerns regarding disease and treatment influences medication taking behavior within men. This was in controversy with the findings of prior studies where female patients showed less adherence. Illiterate patients displayed less priority to self-care and being part of a minority group and having low income resulted in lesser ability to understand medical information and label instructions which lead to decreased adherence compared to literate patients.^(11,12,13,14) Furthermore, our results suggests that socioeconomic status was significantly associated with adherence where lower socioeconomic group showed highest non adherence than other groups. In our study most patients were in the older population and required complex medications for various comorbid conditions which led to frustration and confusion and resulted in unintentional non adherence. However J Bourbeau illustrated that no significant relation was found between polypharmacy and medication adherence.⁽¹⁵⁾

The results suggests that 63% of patients were adherent only during winter when the symptoms hamper their daily functioning while 37% were adherent irrespective of seasonal variations. Nebulizers or inhalers were recommended to the patients according to the patient convenience. In this study 44% of patients were adherent to inhalers whereas only 19% were adherent to nebulizer. Within the given study facility, the availability of nebulizer were free of cost but the patients had to be present in person to avail this facility thus they became non-adherent as many had commuting difficulty and lack of family support. Individuals prescribed with inhalers, which are to be obtained from outside the hospital thus making them unaffordable to the study population. Moreover, patients who have their own inhalers fail to procure refill medications which make them equally non-adherent and inconsistent. Other plausible reasons for non-adherence to inhalers were side effects, forgetfulness and inappropriate inhaler use or less confidence in using inhalers.

Most frequently affecting factors of medication adherence were found to be forgetfulness and intentional stoppage of medications when symptoms improved which was consistent with the study by L Laforest *et al*, AS Gadkari *et al* A R Fugate *et al* and I H Galal *et al*^(16,17,18,19) Patients misinterpret the lack of clinical symptoms as a cure and go for episodic treatment forsaking regular medications hence they execute self-treatment and approaches despite the

instructions given by the healthcare professionals.^(15,20) Other reasons found from the study were negligence towards medication where reasons behind it was lack of seriousness to illness or treatment, lack of self-worth, poor insight and laziness or lack of care. Subsequently another factor found for non-adherence was polypharmacy followed by lack of family support which influences their medication taking behavior. Other reasons found from the study were medication refill delay from pharmacy, refusal of medication use in public, feeling of no benefit from treatment, poor knowledge about medication burden of disease, beliefs like prayer or religious dogmas will help to cure disease, side effects (headache, insomnia and nasal congestion) misbeliefs regarding treatment, trust issues with health care system.

Our study is one of the few study to determine the influence of socioeconomic status on medication adherence. However the study had few limitations. The influence of cost of medication on adherence couldn't be studied as the study was conducted in a government hospital and medicines were freely dispensed from the pharmacy. Correspondingly the time period of the study was limited and medication taking behavior of the upper socioeconomic class could not be assessed from the study site as the patients belonging to this group consulting in our setting was low.

CONCLUSION

In our study, forgetfulness, intentional stoppage of medicines when symptoms improve, negligence to medication, polypharmacy and inadequate family support were reported as the important barriers of medication adherence among COPD patients. A significant association was correspondingly identified between medication compliance and following variables like gender, education, socioeconomic status, climate, polypharmacy, and delivery device of inhaled medications that influence the adherence to a greater extent. Our study was majorly concerned in recognizing the medication taking behavior of patients with low socioeconomic status where health care providers can play a vital role in helping them to overcome the adherence barriers. Low literacy patients can be benefitted by comprehensive counseling and training involving video clip instructions, writings and demonstrations which could be an effective method for enhancing health literacy. Education emphasizing on benefits of medication adherence and enabling the patients for proper inhaler use results in improved self-confidence and perception towards disease and treatment. Inhaler technique of patient's should also be checked by physicians during every follow up visits and their feedbacks should be recorded to enhance adherence. Simplified medication regimens with less frequent dosing must be recommended to reduce confusion and frustration in patients.

There is a need to develop and implement newer amendments as well as procedures in health care system by government bodies and organizations to enhance medication adherence along with counseling, education or training focusing on barriers.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

COPD: Chronic Obstructive Pulmonary Disease; **WHO:** World Health Organization; **GOLD:** Global Initiative for Chronic Obstructive Lung Disease; **MMAS:** Morisky Medication Adherence Scale

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