IMPACT OF PATIENT COUNSELING ON HEALTH KNOWLEDGE AND MEDICATION ADHERENCE IN ASTHMA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS

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ABSTRACT

Objective: This study evaluated the impact of clinical pharmacist-led intervention in health knowledge and medication adherence of Asthma and chronic obstructive pulmonary disease (COPD) patients.

Methods: Questionnaires were designed to assess Health knowledge for Asthma and COPD separately. Medication adherence was measured by using the Morisky Medication Adherence Scale-8. Pre-counseling patient responses were recorded. Patient counseling was given regarding the disease condition, medications, and medication use at baseline visit. Patient responses were re-measured upon follow-up visit. The data extracted were tabulated, statistically analyzed and the results were obtained.

Results: A total of 141 patients completed the study. Before counseling, the mean (±standard deviation) of knowledge and adherence levels were found to be 8.51±3.36 and 5.01±2.11, respectively. After counseling, they increased up to 12.72±2.16 for knowledge (p<0.0001) and 6.60±1.35 (p<0.0001) for medication adherence. The majority of subjects had about 11–30% increase in knowledge as well as medication adherence. Male patients were more adherent to their medication regime than females.

Conclusion: The study demonstrates the positive impact of education and counseling provided by a clinical pharmacist in achieving better therapeutic outcomes – through improvement in medication adherence and health knowledge. In conclusion, continuous education programs and patient counseling should be conducted for chronic diseases to reiterate the importance of medication adherence and, in turn, prevent recurrences, arrest disease progression, minimize hospitalization, and ultimately improve quality of life.

Keywords: Medication adherence, Health knowledge, Asthma, Chronic obstructive pulmonary disease, Patient counseling.

INTRODUCTION

Medication non-adherence in chronic conditions such as Asthma and chronic obstructive pulmonary disease (COPD) is a recognized public health problem [1]. The existing literature suggests that a structured pharmaceutical care plan and clinical pharmacist intervention can help patients in achieving desired health outcomes. Pharmacist intervention is essential in chronic diseases, especially in chronic respiratory diseases, since the success of treatment not only depends on the type of drugs but also on the medication-taking techniques and adherence.

Medication adherence usually refers to whether patients take their medications as prescribed (e.g., twice daily) as well as whether they continue to take a prescribed medication [2]. Patient counseling deals with providing information to the patients regarding their medications in simple Layman's language. It may be defined as providing medication information orally or in written form to the patients or to their representative.

The objective of this study was to evaluate and measure the difference in health knowledge of the patients and medication adherence in Asthma and COPD patients – post-counseling. The study rationale is to reiterate that medication adherence improvements are brought about by pharmacist led intervention like patient counselling, especially with respect to the type of healthcare setting and patient population taken in our study.

METHODS

A prospective cross-sectional observational study was conducted over a period of 6 months in the Department of Pulmonary Medicine (chest outpatient) at a Secondary Care Hospital located in Nacharam, Hyderabad, Telangana.
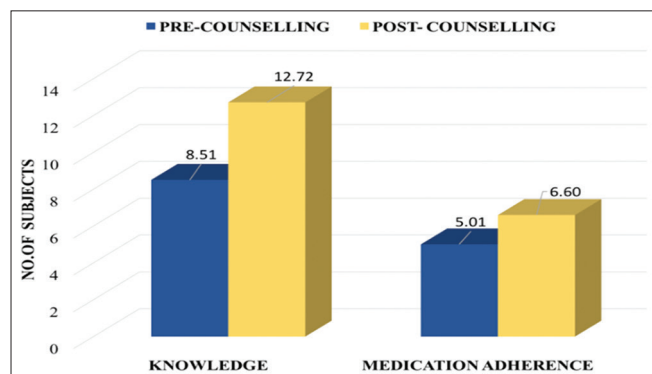
During the study, patients labeled as suffering from Asthma and COPD and seeking treatment for the same; >18 years of age; willing to participate in the study as well as visiting chest outpatient departments were included in the study. Non-cooperative patients, patients with multiple co-morbidities, pediatric, and pregnant population and who were unable to answer or complete data collection forms were excluded from the study. During the study period, the data were collected twice a week, i.e., when the chest outpatient services were open. Questionnaires were designed to assess health knowledge (disease knowledge and medication knowledge) and medication adherence, for Asthma and COPD. Health knowledge questionnaires were prepared for Asthma and COPD that included questions on present diagnosis, causes, symptoms, drug names, drug regimen, inhaler use, etc. The questionnaire was validated by the physician and a pilot study. Morisky Medication Adherence Scale (MMAS-8) was used to measure the medication adherence in both Asthma and COPD patients. Patient counseling sessions involved educating the patient about the disease, symptoms, risk factors and their management, types of drugs used in the treatment, gross mechanism of actions, drug regimen, inhaler use, and side effects. Pre-approved pictorial patient information leaflets were designed and distributed to all the patients. The data collected pre- and post-counseling was managed and analyzed using the software MS Excel 2016. Data were analyzed for means and percentage increase in health knowledge and medication adherence (using MS Excel 2016) to determine the post-counseling effects. The statistical significance was calculated using SPSS 9.0.
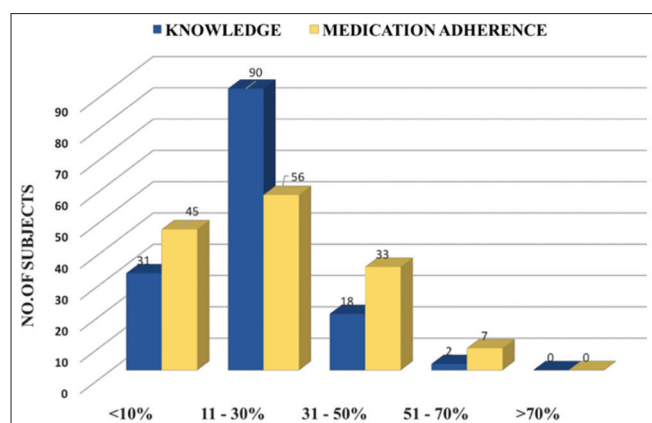
Ethical considerations

All interventions in this study were non-invasive, were done after carefully assessing the need for intervention and implementing them with prior approval from the hospital's management and institutional ethical committee.

RESULTS

The sociodemographic distribution included a total of 150 subjects formed the study population, of which nine were dropped out because of lack of follow up (n=141). Disease-wise distribution showed that Asthma and COPD patients were 109 and 32 in number, respectively,

Graph 1: Mean knowledge and medication adherence scores pre- and post-counseling

Graph 2: Categorical increase in the percentage of knowledge and medication adherence among the study subjects post-counseling

Table 1: Disease-wise distribution of Asthma and COPD

Disease	No. of subjects n (%)
Asthma	109 (77.30)
COPD	32 (22.69)
Total n (%)	141 (99.99)

COPD: Chronic obstructive pulmonary disease

Table 2: Gender-wise distribution of Asthma and COPD

Gender	Male n (%)	Female n (%)	Total n (%)
Asthma	45 (31.91)	64 (45.39)	109 (77.30)
COPD	31 (21.98)	1 (0.70)	32 (22.69)
Total n (%)	76 (53.90)	65 (46.09)	141 (99.99)

COPD: Chronic obstructive pulmonary disease

which accounted for 77.30% and 22.69% of the total population, respectively (Table 1).

Based on the gender-wise distribution of population, the number of males was found to be 45 in number suffering from Asthma and 31 suffering from COPD, whereas females were 64 and 1, respectively. The majority of Asthmatics were females, while in COPD, the male gender was dominant (Table 2).

The whole population was distributed among the following age ranges, i.e., <30, 31–50, 51–70, and >71. The number of subjects falling into the above-mentioned ranges having Asthma was 13, 61, 31, and 4, whereas subjects with COPD were 0, 5, 25, and 2 in number, respectively. Asthma was found to be more among the age group 31–50 years, while COPD was most among the age group 51–70 years, forming 43.26% and 17.73% of the total population, respectively (Table 3).

A family history of the disease in our study population was found to be 40 and 69 subjects of Asthma with and without any family history, respectively. In the subjects with COPD, no family history of the disease was found. The majority of the population, i.e., 101 of 141, was found to have no family history of their disease (Table 4).

Study population's smoking habit showed seven smokers and 102 non-smokers suffering from Asthma, whereas 26 smokers and six non-smokers in COPD. The majority of the population were non-smokers, with only 33 subjects having a smoking habit currently (Table 5).

All the subjects were categorized, education-wise, as illiterate, primary, middle, secondary, higher secondary/intermediate, technical/non-technical diploma, and graduate and above with the number of subjects falling in each category was 55, 11, 12, 28, 12, 4, and 19, respectively. The majority of the population was found to be "illiterate" followed by a significant number who completed secondary schooling (Table 6).

The baseline data on medication adherence showed 85 subjects having low medication adherence. The post-counseling (follow-up) session showed that 48 of those lowly adherent patients have effectively transformed into moderate to highly adherent individuals. Moreover, the remaining 37 subjects with low adherence had a mean percentage increase of 27.87% in their adherence levels. The medication adherence among males and female were found to be 5.24 and 4.73 pre-counseling and 6.67 and 6.52 post-counseling, respectively. The male patients were more adherent than females (Table 7).

The average knowledge and medication adherence scores were calculated to estimate the levels of the same before and after patients were given counseling. It was found that the mean (with standard deviation) of knowledge and adherence levels was found to be 8.51±3.36 and 5.01±2.11 before counseling which increased up to 12.72±2.16 for knowledge (p<0.0001) and 6.60±1.35 (p<0.0001) for medication adherence, respectively, after counseling the subjects (Table 8) (Graph 1).

Each subject fell under a range of categories for percentage increase in knowledge and medication adherences which were created based on the difference between their scores before and after counseling. The ranges of the categories were ≤ng 11–30%, 31–50%, 51–70%, and >70%, with the number of subjects in each category being 31, 90, 18, 2,

Table 3: Age-wise distribution of Asthma and COPD

Age	<30 n (%)	31–50 n (%)	51–70 n (%)	>71 n (%)	Total n (%)
Asthma	13 (9.21)	61 (43.26)	31 (21.98)	4 (2.83)	109 (77.30)
COPD	NA	5 (3.54)	25 (17.73)	2 (1.41)	32 (22.69)
Total n (%)	13 (9.21)	66 (46.80)	56 (39.71)	6 (4.25)	141 (99.99)

COPD: Chronic obstructive pulmonary disease

and 0, respectively. The majority of subjects fell into 11–30% increase in knowledge as well as medication adherence (Table 9) (Graph 2).

DISCUSSION

Our study aimed at improving medication adherence and health knowledge through patient counseling – a clinical pharmacist intervention that evidently can help patients in achieving desired health outcomes. Pharmacist intervention in this study focused on providing disease and medication knowledge and improving medication utilization techniques. Therefore, medication adherence

Table 4: Family history of Asthma and COPD

Family history	Present n (%)	Absent n (%)	Total n (%)
Asthma	40 (28.36)	69 (48.93)	109 (77.30)
COPD	0 (0)	32 (22.69)	32 (22.69)
Total n (%)	40 (28.36)	101 (71.62)	141 (99.99)

COPD: Chronic obstructive pulmonary disease

Table 5: Distribution based on smoking habit of the subjects

	Smoker n (%)	Non-smoker n (%)	Total n (%)
Asthma	7 (4.96)	102 (72.34)	109 (77.30)
COPD	26 (18.43)	6 (4.25)	32 (22.69)
Total n (%)	33 (23.40)	108 (76.59)	141 (99.99)

COPD: Chronic obstructive pulmonary disease

Table 6: Education-wise demographic distribution

Educational level	No. of subjects n (%)
Illiterate	55 (39.03)
Primary	11 (7.80)
Middle	12 (8.51)
Secondary	28 (19.85)
Higher secondary/intermediate	12 (8.51)
Technical/non-technical diploma	4 (2.83)
Graduate and above	19 (13.47)
Total n (%)	141 (100)

Table 7: Medication adherence between males and females

	Medication adherence score in males	Medication adherence score in females
Pre-counseling	5.24	4.73
Post-counseling	6.67	6.52

Table 8: Mean knowledge and medication adherence scores pre- and post-counseling

Mean scores	Knowledge (mean±S.D)	Adherence (mean±S.D)
Pre-counseling	8.51±3.36	5.01±2.11
Post-counseling	12.72±2.16*	6.60±1.35*

*$p < 0.0001$, S.D: Standard deviation, n=141

changes pre- and post-counseling are believed to be the results of the interventions applied.

The majority of females suffered from Asthma while in the COPD category, the male gender was dominant. A study conducted by Shamkuwar *et al*. [3] showed a gender-wise distribution of 80 (51.9%) male patients and 74 (48.1%) of female patients in Asthma, on the other hand, a study conducted by Faheemuddin *et al*. [4] showed a greater number of males than females in COPD.

Asthma was found to be more in the age group of 31–50 years, while COPD was found most in the age group of 51–70 years, forming 43.26% and 17.73% of the total population, respectively. Faheemuddin *et al*. [4] observed most patients of the age group of 61–80 years affected with COPD. Adherence to respiratory therapy was associated with age which was evidenced by a study conducted by Agh *et al*. [5].

With respect to habit-wise distribution, most of our study population (108) was non-smokers, with only 33 subjects being smokers. On the contrary, there was a high percentage of smokers in both intervention 28 (93.3%) and control 25 (83.3%) groups of the study conducted by Faheemuddin *et al*. [4].

Agh *et al*. [5] associated adherence to respiratory therapy with current smoking status ($p < 0.005$) in their study. Therefore, the positive outcomes of this study could be attributed to the non-smoking status of the majority.

A study conducted by Wahyuni *et al*. [6] showed an average difference in the value of adherence based on education and employment (<0.05). In this study, the majority of the population was found to be illiterately followed by a significant number of subjects completing secondary schooling. The highest education adherence was shown by patients with college education level and lowest adherence was shown by patients with primary school education.

According to a study by Prabhakaran *et al*. [7], there were significant improvements in the knowledge of Asthma and medications, self-reported compliance to the treatment regimen, and improvement in inhaler technique because of post-pharmacist interventions. Kovacevic *et al*. [8] showed significantly improved patients' knowledge of Asthma and medications as well as the adherence level with a pharmacist-delivered self-management education. Similarly, our study showed a significant improvement in patient's health knowledge and medication adherence upon receiving counseling.

Overall improvement in both these parameters post-counseling was evidenced by a mean percentage increase of 21.21% and 20.75% in health knowledge and medication adherence, respectively.

In addition, the positive impact of patient counseling on medication adherence was found by a drop in the number of less adherent subjects from 85 to 37 and a mean percentage increase of 27.87% in medication adherence score in subjects who were less adherent post-counseling.

Limitations

This study has a limited population size because only those patients diagnosed through a specific health system were enrolled into the study. The procedural, analytical, and recording errors as well as interviewer bias were not taken into consideration.

Table 9: Categorical increase in the percentage of knowledge and medication adherence among the study subjects post-counseling

% increase	No. of subjects n (%)					
	<10%	11–30%	31–50%	51–70%	>70%	Total n (%)
Knowledge	31 (21.98)	90 (63.82)	18 (12.76)	2 (1.41)	0 (0)	141 (99.97)
Medication adherence	45 (31.91)	56 (39.71)	33 (23.40)	7 (4.96)	0 (0)	141 (99.98)

CONCLUSION

The study focuses on the positive impact of health education and counseling provided by a clinical pharmacist in achieving better therapeutic outcomes through improvement in medication adherence and health knowledge. It signifies the regular implementation of patient counseling as a mandatory clinical pharmacy service in the management of chronic diseases such as Asthma and COPD for improving quality of life. The study demonstrated the role of patient counseling along with other clinical pharmacy services as part of routine bedside and outpatient consultations which proved to be a major game changer in achieving patient-centric treatment goals. Continuous patient education programs and counseling services in a general healthcare setting is gaining momentum with both patients and health-care providers benefitting from them. With patient counseling covering the entire spectrum of activities under its umbrella, from evaluating social domestic profile to identifying major factors influencing medication-taking behavior and adherence, and conducting counseling sessions to meet individual needs, it is an undisputable solution for problems such as non-adherence and other drug-related problems. The study also has a futuristic view of analyzing the role and efficiency of different patient education tools and counseling aids in improving patient compliance and optimizing therapeutic outcomes.

AUTHORS' CONTRIBUTIONS

Gabriela Keerthana helped conceptualize and design the study. In addition, she reviewed and finalized the study report as well as the manuscript.

Unnati and Anushreya were responsible for literature review, questionnaire design, data collection, patient counseling, data analysis, manuscript writing, and editing.

Mounica contributed toward literature review, data collection, and patient counseling.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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