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Experience of COPD and Asthma Patients in Abuja: Using Questionnaire and Spirometry

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Abstract

Most health professionals working in the respiratory department might have heard of some of the complaints from COPD or asthma patients. Therefore, in this article, the different experiences of COPD and asthma patients were assessed. A cohort study using 402 adults with COPD and asthma patients completed a respiratory questionnaire and a lung function test was conducted monthly using spirometry and was analyzed in Abuja. In total, 402 participants were recruited, 262 with COPD, and 140 with asthma. During the thirty (30) months, participants reported quality of life impairment. Reported impairment was significantly associated with FEV_1 and t, the dyspnoea scale was positively linked with FEV_1 changes. Participants showed impairment in their quality of life. Most of the changes in quality of life are determined by factors other than those considered relevant for treatment and follow-up. The outcome of this study showed that participants' symptoms affect the participants' quality of life.

Keywords

Respiratory function, COPD, Asthma, Symptom

1. Introduction

Globally, asthma and chronic obstructive pulmonary disease (COPD) are chronic respiratory diseases with similar pathology [1, 2] and are among the leading causes of sickness and death [2, 3]. They affect patients' emotions, and physical and social function (quality of life). Quality of life is vital in coping with chronic diseases such as COPD and asthma and in this condition, long-time systematic monitoring of the sufferers is highlighted with the goal of preventing more effects on the lung function and achieving an optimal functional status of the patient [3-6]. It is vital to acquire insight into the effect of the disease on the patients. If the quality of life of patients with COPD and asthma is limited; a better knowledge of the factors influencing these limitations is relevant [1, 4, 5]. The question is, is it possible to identify patients with a deteriorated quality of life based on available data in a routine hospital visit (such as medication, symptoms, Lung function, and/or comorbidity)? From previous studies more severely affected patients with changes in quality of life are largely explained by the degree of breathlessness, by the production of phlegm or cough by a small degree, and hardly at all by forced expiratory volume (FEV) [2, 3, 5]. Also, little is known in this area about COPD and asthma patients with a mild or moderate form of COPD and asthma that are usually treated in developing countries such as Nigeria [1, 5, 6]. This study monitored the impairments in patients diagnosed with COPD and asthma in respiratory clinic outpatients. The aim was to investigate the changes in the patient's quality of life condition (lung function and symptoms). In this study, a respiratory health questionnaire derived from SGRQ, MRC dyspnoea scale, and lung function was used.

2. Method

The participants in this study are part of a major study effect of photochemical smog on COPD and asthma patients in Abuja Nigeria. This cohort study was conducted from June 2016 to December 2018 using 402 participants diagnosed with COPD and asthma who gave consent and were registered in two government hospitals used for the study. Ethical approval was obtained from the university and the two hospitals used for the study. Of the 402 participants, 262 patients with COPD, and 140 patients with asthma. For each patient, condition/quality of life data was collected and correlated to lung function data. All patients gave written informed consent and were invited to a completed questionnaire at the beginning of the study, lung function test was performed every month and the level of breathlessness was measured using the MRC dyspnoea scale. The procedures of data collection were previously described in detail [7]. In brief, we obtained data on demographic characteristics, and medical history, and measured lung function using Spirometry.

2.1 Analyses

For both the questionnaire and dyspnoea scale, the distribution of the scale (scores) and the mean, (SD) are given for each chart. The mean score for symptoms and dyspnoea scales are compared with the lung function using multiple regression. The relationship between dyspnoea and lung function was also determined.

3. Results

A total of 402 participants who meet the study criteria were recruited the characteristics of the participants are given in Table 1. Some of the patients used inhaled medication for their disease, but the average lung function impairment was only mild. The questionnaire was fully completed by all the patients. There were no significant differences concerning patient characteristics between daily symptoms and dyspnoea scales; these did not differ in age, sex, and level of education.

Table 1. Participants characteristics

Variables	Male (157)	Female (245)
Age	52.8	51.7
Height	167.9	163.5
Weight	65.3	68.2
%Smoked	10.3	5.6
%FVC	40.3	42.5
$\%FEV_1$	20.3	22.9
MRC Dyspnoea scale	4.2	4.7
BMI	22.9	24.3
COPD	77	185
Asthma	30	110
Comorbidity	55	38

3.1 Quality of life

Both the outcome of the completed respiratory questionnaire and dyspnoea indicated that the quality of life is reduced among the participants with mild to moderate disease severity. Regarding the participants' experience/symptoms, almost two-thirds of the patients stated some impairment in physical fitness, daily routine, feelings (Table 2), and the number of symptoms per week (Figure 1). About 23% of the participants reported severe impairments. There were significantly more impairments compared with a normal population excluding physical fitness. The dyspnoea scale showed the same picture (Table 3). Most of the impairments reported are related to breathing problems, physical problems (such as tiredness), and daily and domestic activities (such as going up and down stairs, bathing, and clothing).

Table 2. Distribution of Score and Mean score (SD) on the respiratory Questionnaire

Variables	No impairment	Slight impairment	Moderate impairment	Severe impairment	Mean (SD) Unable	Mean (SD) Normal
Physical fitness	12%	42%	40%	6%	2.15 (1.11)	2.35 (1.0)
Daily activities	10%	52%	31%	7%	2.04 (1.07)	1.60 (0.8)
Social activities	14%	46%	31%	9%	1.68 (.88)	1.45 (.9)
General health'	Very well	Well	Moderate	Bad		

Table 3. Level of breathlessness in relation to the MRC dyspnoea scale

Grade	Score
1. Not troubled by breathlessness except on strenuous exercise	4.0
2. Short of breath when hurrying on a level or when walking up a slight hill	10.5
3. Walks slower than most people on the level, stops after a mile or so, or stops after 15 min walking at own pace	43.5
4. Stops for breath after walking 100 yards, or after a few minutes on level ground	32.2
5. Too breathless to leave the house, or breathless when dressing/undressing	9.8

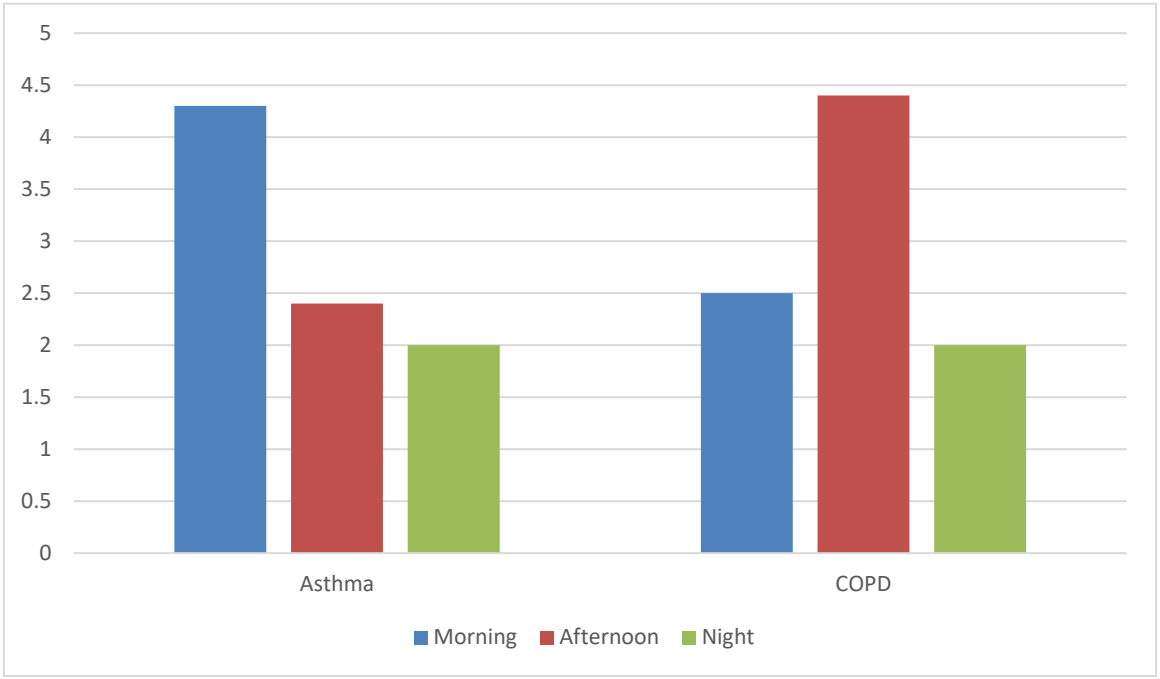

Figure 1. Number of participants' daily experience.

In this study, it was observed that the prevalence of daily symptoms was high for patients with COPD and asthma. During the 30 months of observation, patients experienced on average four crises for asthma and seventeen for COPD in a week. From Figure 1, it was observed that participants suffering from Asthma had more crises in the morning compared to COPD participants. While COPD had more crises (symptoms) during the afternoon which may be linked to their daily exposure/activities. This result may be useful in targeting interventions for high-risk asthma and COPD patients who experience limitations or interruptions of daily activities, and they may be at greater risk for exacerbations.

3.2 Relationships between Dyspnoea scale and Lung function

Table 4. Correlation between FEV_1 and dyspnoea

		Dyspnoea
Pearson Correlation	FEV_1	-.802**
Sig. (1-tailed)		.001
N		30

For the five-dyspnoea scale, the relationships between lung function and dyspnoea, the correlation shows that the association between the variables was in a negative direction (Table 4). It also showed that dyspnoea had a significant association with FEV_1, the higher on dyspnoea grade the lower the FEV_1 value. This shows the relationship between breathlessness and the forced expiratory volume and that may be a result of the condition/ inflammation which leads to breathing obstruction.

To further test and predict the association on FEV_1, multiple regression, it was tested by gender.

The correlation between the male and female FEV_1 shows that the association between the variables was in a negative direction. It was also observed that dyspnoea had a significant association with male and female FEV_1. R (multiple correlation coefficient), which is a measure of the quality of the prediction of the dependent variable (FEV_1), with a value of .812 for male and .756 for female shows a very good prediction. The R Square (R^2), also called the coefficient of determination, is the relative amount of variance in the dependent variable that can be explained by the independent variables. That means R^2 is the amount of variation accounted for by the regression model above and beyond the mean model. From the analysis outcome, the R^2 value of 0.660 for male FEV_1 and .571 for female FEV_1 indicates that our independent variables explain 66.0% of the variability of our dependent variable, FEV_1. Also, the adjusted R square with a value of .465, and .326 predicts that the additional input variables are likely to add value to the model, and the F- ratio indicates that the independent variables statistically significantly predict the dependent variable, $F(4, 7) = 3.394$, $p = .076$ (the regression model is a moderate fit of the data).

Therefore, a multiple regression test was used to predict male FEV_1 from the level of breathlessness(dyspnoea). The variables significantly predicted male FEV_1, $F(4, 7) = 3.394$, $p = .076$ (i.e., $P>.05$), $R^2=.660$. The Dyspnoea scale added statistical significance to the prediction $P=.076$. One variable (O_3) also added statistical significance to the prediction. Each variable was added or removed from the regression model to determine which will decrease or increase the adjusted R squared, thus indicating that the variable contributes to the effect on male FEV_1. Dyspnoea scales 4 and 5 increased adjusted R squared, while other variables' contribution to the multiple regression model was not significant. As observed within the variables, two were negatively associated with female FEV_1. The model of the multiple regression with four predictors generated $R^2 = .571$, $F(4.7) = 2.330$, $p = 0.115$ i.e., $P>.05$). The regression coefficient was significant.

3.3 Characteristics of patient's respiratory questionnaire and Dyspnoea scale

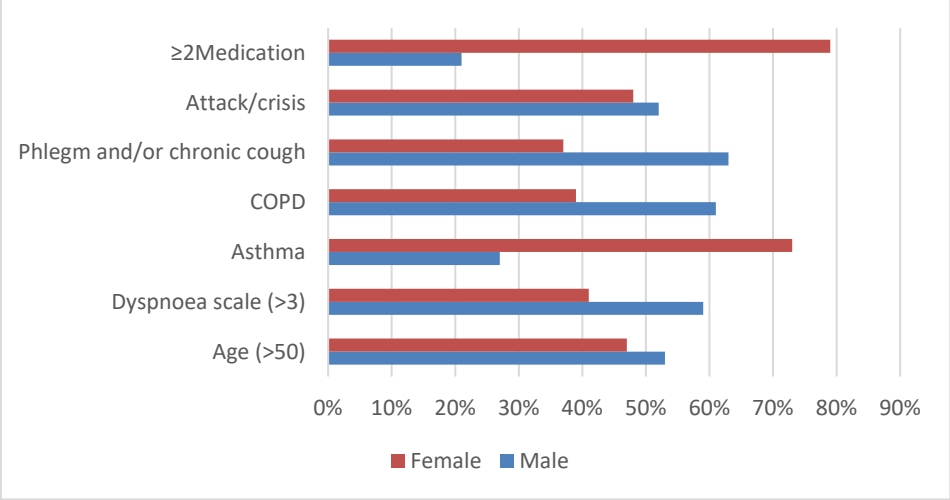

Figure 2a. Participants' experiences and dyspnoea scale.

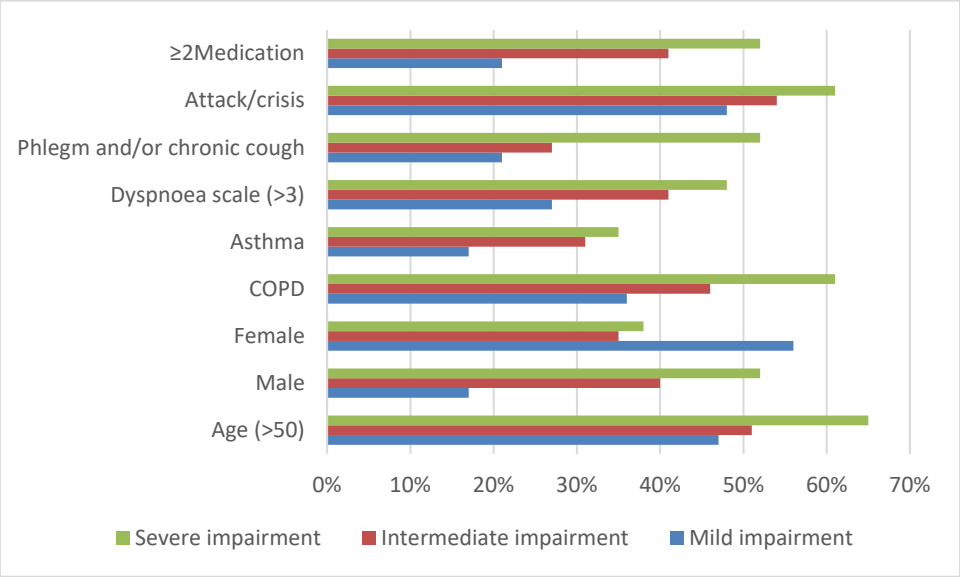

Figure 2b. Participants' various levels of impairment.

Patients with a higher dyspnoea scale (more impairment) are characterized as more frequently having more symptoms (aggravations) such as chronic cough and/or production of phlegm, more severe dyspnoea, and using more inhalers or medications see Figure 2a. However, some participants with high dyspnoea scores did not show these characteristics(symptoms). In the dyspnoea-lung function test, such a pattern of distinguishing characteristics is also seen (Figure 2b). As observed older participants (>50) and males showed to experience more serious impairment from the completed questionnaire (respiratory questionnaire and MRC dyspnoea scale).

4. Discussion

All the participants in this study have been diagnosed and registered in the respiratory unit or department of the two hospitals used for this study. The participants are being treated by their doctor for asthma/COPD and enrolled in this study during their hospital visit/medical check-up and quality of life(experience) is measured. This study examined the experience of COPD and Asthma Patients in Abuja using questionnaires and Spirometry tests. Most of the participants in this study showed impairments in quality of life measured with the Dyspnoea scale five statements, as well as with a 26-item respiratory health questionnaire and lung function (spirometry)test. However, only a small proportion of the participants had severe impairments. These more severely impaired participants have more symptoms and more frequent aggravations of their condition, particularly those with COPD [2, 8, 9]. In this study, the contrary was observed some participants with severe impairment frequently reported a limited number of symptoms or were diagnosed as being asthmatic. Therefore, the relationship between the quality of life and clinical characteristics such as pulmonary function tests, and medication use, was limited.

For the dyspnoea scale, only one-third of the variance could be explained by these characteristics, and their experience from the respiratory questionnaire was the same. Therefore, quality of life scores as measured by these instruments in the participants appear to be determined only to a considerable degree by disease and patient characteristics known to participants. Of these characteristics, the degree of dyspnoea was the most important determinant for the impaired quality of life in general as well as in the questionnaire. These findings are in line with the literature [1, 10-12]. In this population (mild to moderate disease severity as expressed in FEV_1, but with medication use by most patients) the greater part of the variation in the quality of life is determined using the questionnaire.

In other studies anxiety, depression, and neuroticism were, for example, mentioned as factors explaining the variation [2, 13, 14]. Coping (how patients deal with the disease) and self-efficacy (the extent to which the patient feels capable of managing the disease adequately) have also been reported to explain the quality of life. For daily practice and in the follow-up of patients, it is relevant to know that dyspnoea is related to impaired quality of life. Also, maintaining lung function at the highest possible level seems to be the most vital determining factor for the patient's prognosis, this might not be experienced as an improved quality of life by the participants. This might also explain why studies with inhaled steroids have failed to show an improvement in quality of life [2, 15-17]. While studies with bronchodilators did show an improvement in quality of life, especially with long-acting bronchodilators [3, 18-20].

Studies with other disease-specific quality-of-life instruments, also using a seven-point item scale, showed that it is possible to detect changes in the quality of life-related to changes in the patient's clinical condition in cases where patients had a relevant impairment of their quality of life at baseline [3, 21, 22].

5. Conclusion

The participant's experience and dyspnoea scale proved to be sensitive to change in case of asthma and COPD aggravation. In this study, most of the patients reported impairments in quality of life (mild to severe). The outcome of this study increased the possibility of using the same approach in research quality of life routine follow-up care. Clinical data (FEV), as shown in this study and other studies, are generally good predictors of the participants' quality of life and are of substantial help to doctors and health professionals in identifying patients with impaired quality of life. Therefore, this study adds to a growing body of evidence that the experience/symptoms of asthma and COPD patients can reveal new insights about their conditions and contribute to more effective self-management and physician intervention.

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