ASTHMA SEVERITY AND SELF-CARE PRACTICES AMONG ASTHMA PATIENTS IN RWANDA

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ABSTRACT

Objectives: This study aimed to evaluate asthma severity levels and self-care practices in asthma patients in Rwanda.

Methods: In this study, we have used a quantitative cross-sectional study design. The questionnaires were distributed to asthma patients who voluntarily accepted to participate in the study. The obtained information were recorded in Excel sheet and transferred to SPSS version 22 for statistical analysis. Asthma severity levels in study participants were categorized referring to Global Initiative for Asthma classification scheme. Moreover, the levels of self-care practices were classified into three categories (Good, Moderate and Poor self-care practices) depending on participant's behavior regarding asthma self-management. The association between asthma severity and self-care practices was determined using Chi-square test.

Results: The findings showed that: 52 (65%) had persistent mild asthma, 12 (15%) had persistent moderate, 6 (7.5%) had intermittent, and 5 (6.3%) had persistent severe. In addition to that, among study participants, 45 (56.3%) had moderate self-care practices while 27 (33.8%) had good self-care practices and 2 (2.5%) had poor self-care practices. Furthermore, two self-care practices including avoiding pollen exposure and drinking alcohol exhibited an association with asthma severity (p=0.03) and (p=0.045), respectively.

Conclusion: There is an association between asthma severity and self-care practices and our study findings suggest enhanced patient's self-care practices to contribute in reducing asthma exacerbation.

Keywords: Asthma severity, Self-care practice, Asthma patients.

INTRODUCTION

Asthma is a highly prevalent heterogeneous disease characterized by various airflow obstructions with cough, dyspnea, and wheezing. Patients are also at risk of exacerbations, which may lead to hospitalization and death [1]. It affects approximately 358 million causing annual death of 180,000 worldwide [2]. Approximately, more than 50 million cases are in Africa and 10% of them have severe disease, experiencing inadequate disease control with available treatment or inadequate treatment adherence and treatment cost unaffordability [3,4].

Unaffordability of treatment cost and increasing trend of asthma prevalence in sub-Saharan countries are a major public health challenge. In addition to that, the rise in atopic sensitization, allergic conditions, and the changing pattern of environmental triggers linked to anarchic urbanization continue to trigger asthma exacerbation and complicating the disease management [5].

Although the use of corticosteroids and bronchodilators was reported to be good treatment, contributing in asthma exacerbation prevention, they remain unavailable and unaffordable in most low-income countries. Moreover, the disease is more dramatic in low-income countries especially in sub-Saharan countries, where 50% of patients do not adhere to medications as prescribed, especially the controllers which could be intended or non-intended, thus poor outcome and asthma exacerbation [6,7].

Different studies have highlighted the role of patient self-care management to be a good way of asthma exacerbation prevention and poor outcome reduction. Moreover, self-care practices were shown to contribute in delaying the disease progression to severe form, thus, reducing hospitalization and cost related treatment [4,8]. However, in Africa, there are still many gaps in documentation and reporting of the association between the quality of asthma self-care practices and the severity of the disease. The availability of data about this association is of the great value as it reflects the real disease status and promotes experience sharing. In addition, the understanding level of asthma severity is necessary and critical to asthma research [9]. Global Initiative for Asthma (GINA) guidelines categorize asthma patients based on level of symptoms, of airflow limitation, and of lung function variability and provide four categories including Intermittent asthma, mild persistent asthma, moderate persistent asthma, and severe persistent asthma [6].

In Rwanda, the Ministry of Health has integrated and decentralized non-communicable disease (NCD) services to all health facilities countrywide. Since 2007, the NCD program commenced by addressing the needs of symptomatic patients with severe and persistent disease, including asthma [10]. Although the implementation of this policy is very important, asthma severity levels are not documented and patients' self-care practice as a key way of asthma management to prevent exacerbation is not well known in Rwanda. Therefore, the current study aimed to evaluate frequent exacerbation, providing more comprehensive information about asthma severity levels and self-care practices in patients with asthma in Rwanda.

METHODS

Study design and setting
The study has adopted a descriptive cross-sectional design to evaluate asthma severity and self-care practices in Rwanda. It was conducted in four selected health facilities in Rwanda: Kibagabaga District Hospital,

Kagugu Health Centre, Kinyinya Health Centre, and Remera Health Centre. The study participants were recruited from adult patients diagnosed with asthma at least in the past 3 months and more, and who voluntary accepted to participate in the study.

Study population

All adult patients with asthma who have visited the selected health facilities during the data collection period were included in the study. In total, 80 participants were recruited including thirty participants recruited from Kibagabaga District hospital (four in the service of NCDs and 26 at emergency service), 18 participants recruited from Kagugu Health Center, 12 participants recruited from Kinyinya Health Center, and 20 participants recruited from Remera Health Center.

Data collection

Data collection was done using questionnaires composed of three main parts including demographic characteristics, asthma severity, and self-care practices. We have adopted and used the questionnaire REALISE "REcognise Asthma and LInk to Symptoms and Experience" used in Asia [11] and in Europe [12]. The permission to use this tool was obtained from the author and was adapted to this study based on the literature. To test the reliability of the questionnaire, Cronbach alpha was calculated for internal consistency after administering the questionnaire to participants before starting data collection in pilot study done at Kibagabaga district hospital and the value was 0.77 which was in acceptable range [11,12].

Data analysis

The data from questionnaires were recorded on Excel sheet and transferred into SPSS version 22 for statistical analysis. Descriptive statistics, frequencies, and percentages of asthma severity and self-care practices were calculated. Asthma severity levels were classified using GINA classification categories, which has four categories including intermittent, mild persistent, moderate persistent, and severe persistent [6]. The patients who experienced symptoms of exacerbation <2 days a week were classified in the category of intermittent. The patients who experienced symptoms of asthma more than 2 days a week were classified into the category of mild persistent, those who experienced symptoms of exacerbation every day were classified into the category of moderate persistent while the patient who experienced symptoms of asthma several times a day was classified into the category of severe persistent.

Moreover, the level of self-care practices was evaluated and classified according to the patient's behavior regarding self-management. Out of 12 as total score, the patients who scored below 6 were classified in level 1 (poor self-care practices), those who scored 6–8 were classified in level 2 (moderate self-care practices), and those who scored above 8 were classified in level 3 (good self-care practices). The patients who did not provide all required information to be classified were putted into the category of unclassified. The association between asthma severity and self-care practices was determined using Chi-square test. $p < 0.05$ was considered statistically significant.

Ethical consideration

The ethical clearance to conduct this study was received from IRB of the UR/CMHS and then it was presented to the authorities of selected health facilities. Permission for conducting research was granted from all selected health facilities. The researcher has explained the purpose, the implication and the importance of the study to the participants before enrollment. The participants who voluntarily consented to participate signed the consent form and were allowed to withdraw from the study at any stage of the study.

RESULTS

Study population and characteristics

The demographic characteristics are presented in Table 1. Among the 80 participants, 57 (71.2%) were female while 23 (28.8%) were male. The majority 24 (30%) of respondents were above 61 years and 56 (70%)

Table 1: Demographic characteristics of the participants

Variables	Frequency (%)
Gender	
Male	23 (28.8)
Female	57 (71.2)
Age groups	
18–30	6 (7.5)
31–40	10 (12.5)
41–50	20 (25)
51–60	20 (25)
Above 61	24 (30)
Marital status	
Single	4 (5)
Married	56 (70)
Divorced	6 (7.5)
Widowed	13 (16.3)
Separated	1 (1.3)
Occupation	
Farmer	29 (36.3)
Employed	6 (7.5)
Self-employed	26 (32.6)
Unemployed	19 (23.8)
Family member suffer from asthma	
Own children	3 (3.8)
Parents	18 (22.5)
Sibling	3 (3.8)
Other family member	27 (33.8)
None	29 (36.3)
Years living with asthma	
1 year or less	1 (1.3)
2–5 years	9 (11.3)
6–10 years	12 (15)
Above 11years	58 (72.5)
Total	80 (100)

Data are presented as frequency (%) unless otherwise indicated. Total number of participants (n)=80

were married. The main occupation of participants 29 (36.3%) was farming while most of them have finished at least primary school 59 (73.8%). Seventy-seven (96.2%) and 58 (72.5%) of the participants were Christians and have been living with asthma for above 11 years, respectively (Table 1).

Asthma severity in asthma patients

Among 80 participants, asthma patients who had difficulty in breathing, cough, limitation of activities more than 2 days a week were 51 (63.8%), 50 (62.5%), and 50 (62.5%), respectively, while 16 (20%) had difficulty in breathing, cough and or limitation of activities every day. Participants who had difficulty in breathing, cough and limitation of activity <2 days a week were 9 (11.3%), 8 (10%), and 10 (12.5%), respectively, and participants who had difficulty in breathing, cough, and limitation of activity several times a day were 7 (8.8%), 5 (6.3), and 5 (6.3%), respectively (Table 2).

Asthma severity classification among the study participants

Fig. 1a gives a summary of asthma severity classification. Most of the participants 52 (65%) had persistent mild asthma while persistent moderate were 12 (15%), intermittent were 6 (7.5%), persistent severe were 5 (6.3%), and unclassified participants were 5 (6.3%) (Fig. 1).

Self-care practices in in the study participants

This study has evaluated the frequency and percentage of self-care practices among patients with asthma. The finding showed that 78 (97.5%) of the participants keep warm when it is cold in order to prevent asthma attack, those who avoid pollen exposure were 74 (92.5%) and those who take medication as prescribed were 74 (92.5%). Among the participants, 68 (88.3%) take balanced diet regularly, 65 (82.3%) use inhaler, 64 (80%) use tablet in treatment of asthma, 36 (45.6%) drink alcohol, 30 (37.5%) take medication in case of asthma attack only, and 11 (13.8%) do regular physical exercise while 9 (11.3%) regularly

Table 2: Participant responses about self-care practices

Statement of self-care practices	Response	Frequency (%)	Asthma severity Chi-square (p-value)
Regular health facility visit	No	71 (88.8)	0.291
	Yes	9 (11.3)	
Use of tablet	Yes	64 (80)	0.943
	No	16 (20)	
Use of inhaler	No	14 (17.7)	0.554
	Yes	65 (82.3)	
Take medication as prescribed	No	6 (7.5)	0.479
	Yes	74 (92.5)	
Regular physical exercise	No	69 (86.3)	0.077
	Yes	11 (13.8)	
Keep warm when it is cold	No	2 (2.5)	0.233
	Yes	78 (97.5)	
Avoid pollen exposure	No	6 (7.5)	0.03
	Yes	74 (92.5)	
To take balanced diet regularly	No	9 (11.7)	0.355
	Yes	68 (88.3)	
To take medication in case of attack only	Yes	30 (37.5)	0.301
	No	50 (62.5)	
To remain home in case of asthma attack	Yes	8 (10)	0.643
	No	72 (90)	
To drink alcohol	Yes	36 (45.6)	0.045
	No	43 (54.4)	
To smoke	Yes	6 (7.7)	0.818
	No	72 (92.3)	

Data are presented as frequency (%) unless otherwise indicated. n=80, p-value<0.05 was considered statistically significant

Fig. 1: Asthma severity classification among respondents. Data are presented as frequency (%) unless otherwise indicated=80

Fig. 2: Level of self-care practices in patients with asthma. Data are presented as percentage unless otherwise indicated. n=80

visit health facility and 8 (10%)remain home when they have asthma attack and lastly 6 (7.7%) have the habit of smoking (Table 2).

The levels of self-care practices
The current study has found that most of the participants had moderate self-care practices 45 (56.3%), while 27 (33.8%) had good self-care practices and 2 (2.5%) had poor self-care practices while 6 (7.5%) did not provide responses to be classified (Fig. 2).

Association between asthma severity and self-care practice
Furthermore, we evaluated the association between asthma severity and self-care practice. Chi-square analysis showed a statistically significant association between asthma severity and some self-care practice variables including avoid pollen exposure (p=0.03) and drinking alcohol (p=0.045). However, other self-care practice variables did not show any statistical significant association with asthma severity (Table 2).

DISCUSSION

In this study, we have found that mild persistent asthma was predominant among participants 65%, which indicates that many participants were in the category of mild persistent asthma where they get symptoms of asthma at least 2 times a week. The previous study conducted in Rwanda has found that most of participants were in moderate persistent category [10]. We speculate that this decrease could be attributed to a decentralized NCDs services in Rwanda where patients access the service at nearby health center.

This study has evaluated self-care practices and asthma severity and we have found that most of our study participants had moderate self-care practices 56.3%. This is in accordance to the study conducted among adult with asthma in USA where the patients used to keep warm when it is cold to prevent asthma attack [13]. About 92.5% of the current study's participants avoid pollen exposure to prevent asthma exacerbation and this practice has shown an association with asthma
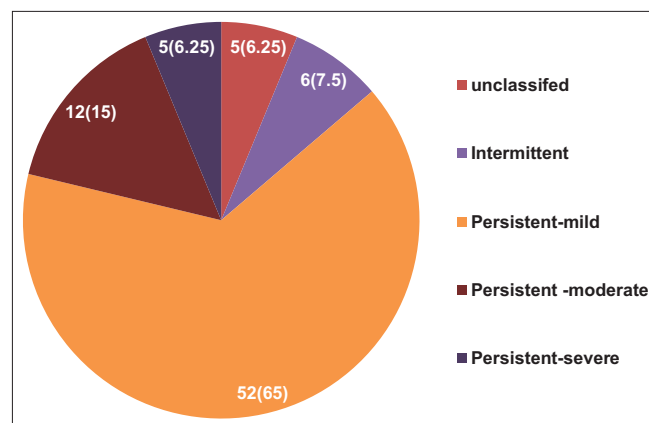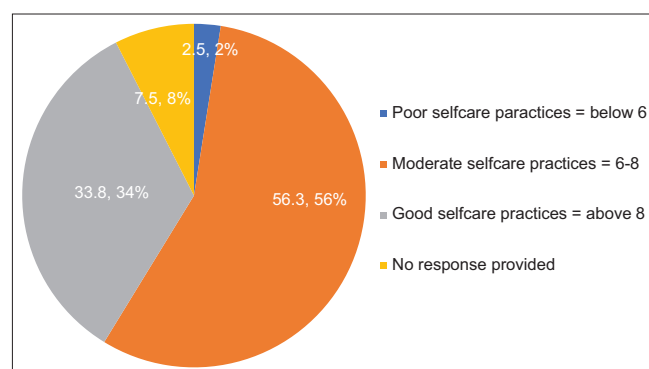
severity. This is similar to the previous study where they showed an effectiveness of practicing the behavior of avoiding pollen exposure and its effectiveness in reducing the severity of asthma [14]. Among the respondents in this study, 7.7% have the habit of smoking. This is similar to the controlled trial done in USA among patients with asthma, where 10% of the participants were smokers and smoking cessation lead to asthma severity reduction [15]. Health-care providers have to emphasize in education about smoking cessation [16].

Asthma severity has exhibited a statistically significant association with self-care practices. Among self-care variables, the practice of avoiding pollen exposure has shown an association with asthma severity. This means that asthma severity is reduced when the patient avoid pollen exposure. This is in accordance with the study conducted in Netherland about a reintroduction of environmental mite allergen control strategies for asthma treatment and the debate on their effectiveness where it is shown that avoiding pollen exposure reduce asthma exacerbation [14]. In addition, those results are similar to the study done in Germany "Asthma Trigger Reports Are Associated with Low Quality of Life" [17]. Moreover, drinking alcohol was significantly associated with asthma severity. It means that alcohol consumption can influence asthma severity. This is in accordance to the study done in France where they found a dangerous relationship between alcohol consumption and lung damage which induce asthma exacerbation [18]. It means that alcohol consumption habit can cause asthma exacerbation. We speculate that those patients with alcohol drinking habit may even forget to take their medicines and exhibit reduced self-care practices.

Limitations
The current study did not evaluate the perception of the participants on self-care practices. Further studies could evaluate if the patient's perception could influence self-care practices.

CONCLUSION

The majority of study participants had persistent mild asthma and self-care practices were moderate among most of participants. Asthma severity and self-care practices exhibited a significant association. In addition, avoiding pollen exposure and drinking alcohol exhibited an association with asthma severity. Thus, the results of this study suggest that patients with asthma need to enhance their self-care practices to prevent asthma exacerbation.

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