

## Original Research Article

### **PATIENTS' FACTORS INFLUENCING USE OF ASTHMA ACTION PLANS**

### **AMONG ADULT ASTHMATIC PATIENTS AGED 18-65 IN NYAMIRA, KENYA**

#### **ABSTRACT**

**Introduction:** Globally the World Health Organization (WHO) estimates that up to 334 million people suffer from asthma. In Kenya it is estimated that about 10% of the Kenyan population, or 4 million people, have asthma.

**Aim:** The objective of this study was to assess knowledge, attitude and practices of patients 18-65 on the use of personalized asthma action plans in Nyamira County.

**Methodology:** Cross-sectional study design was employed in this research. Participants were selected using systematic sampling. Significant differences in categorical variables were found using the Chi-square and Fisher's Exact Test. The threshold for statistical significance was set at  $p < 0.05$ .

**Results:** The study sample size was 220 asthma patients. The majority of responders (72.7%) were unaware of PAAPs. Concerning attitude, most of participants had a negative attitude about the use of PAAPs, believing that they should only be used by the extremely ill (63.6%). Poor practices were seen among the patients who had access to these tools, with 39.0% checking them at home and 61.0% never checking them at all. Statistically there were significant association between the various patients' factors influencing use of asthma action plans among adult asthmatic patients with a  $p = 0.021$ .

**Conclusion:** The majority of the patients (76.4%) who participated in this research did not use the personalized asthma action plan cards. Additionally, the majority of participants

reported poor practices on PAAPs, low levels of awareness, and negative attitudes. To combat the low-level knowledge, negative attitude, and poor practices among asthma patients, the ministry of health should raise awareness about the use of PAAPs.

Key words: PAAPs-personalized asthma action plans, respiratory condition breath, chest tightness

## **ABBREVIATIONS**

PAAPs: Personalized asthma action plans

DALYS: Disability Adjusted Life Year

ED: Emergency Department

ER: Emergency Room

## **1. INTRODUCTION**

Asthma is a common respiratory condition characterized by recurring wheeze, shortness of breath, chest tightness and cough which varies with time and intensity, and often severe at night (Global Initiative for Asthma, 2020).

Globally the World Health Organization (WHO 2021) estimates suggest that up to 334 million N people are affected, with the majority of affected people living in low- and middle-income countries (Global Asthma Report 2014); the total burden may be greater than reported owing to the high prevalence of asthma in countries that lack adequate reporting mechanisms. The economic burden of asthma is considerable, with direct treatment costs and

indirect costs of lost productivity among the highest for non-communicable diseases (Global Asthma Report 2014).

In Africa, there are still many gaps in the report on asthma prevalence, reflecting the challenge in the diagnosis of asthma and the weak access to care facilities and asthma medications in this continent.

Asthma prevalence data in Africa are limited to the ISAAC studies in selected countries. The prevalence was as follows: Ethiopia 9.1%, Nigeria 13.0%, and South Africa 20.3%, Algeria 8.7%, Morocco 10.4%, and Tunisia 11.9% (ISAAC 2016).

In Kenya It is estimated that about 10% of the Kenyan population, or 4 million people, have asthma. Asthma is more prevalent in urban as opposed to rural areas. (Guidelines for asthma management in Kenya 2011)

## **2. METHODOLOGY**

### **2.1 Study Design**

A descriptive study design in which mixed study was done using both quantitative and qualitative techniques was used to collect analyze and summarize data in this research. Primary data that was obtained by administering questionnaire to the study population. The quantitative section of the questionnaire enabled the researcher to link the personal characteristics like age, sex and socio-demographic with use of personalized asthma action plans. The qualitative section of the questionnaires enabled the researcher to collect data in the actual context including the perspectives of both the patients and health care providers.

### **2.2 Study Area**

The study was carried out in Nyamira County Referral Hospital in Nyamira County.

Nyamira County is a county in the former Nyanza Province of Kenya.

The county has a population of 605,576 of which 290,907 are male, 314,656 are female, and 13 who are intersex. The county has a population of 605,576 (2019 census). Its capital and largest town is Nyamira, with an urban population of around 41,668 (2009 census). County has a temperature range between 10C – 28.7C and Annual rainfall ranges between 1200 mm-2100 mm per annum. Long start December to June in and short rain seasons from June and July to November. (Nyamira CIDP 2018-2022)

The county poverty level is at 46.3% according to world data atlas 2006 and according to GDP and GDP per capita. It was ranked no 25, 2017 Kenya National Bureau of Statistics). There is an increased risk of asthma at among people of low socioeconomic status (Anita L.et al. 2011)

### **2.3 Study Population**

Adult asthmatic patients (18-65 years) attending Nyamira County Referral Hospital chest clinic. The aim was to sample 220 participants during the study. The study took a period of 2 months. The study also used 6 health care providers working in Nyamira County Referral Hospital chest clinic. The age between 18 – 65 ages tends to have high chances of severe asthma since as the people tend to age the response of asthma on the patients tend to go high this is according to study supported by Zein et al. (2015). In those above 65 years there are other comorbidities like COPD and the immunity in both children and adults is weak.

### **2.4 Sample size determination**

The appropriate sample size was calculated using Fisher's formula (Mugenda and Mugenda, 1999) based on 95% confidence interval and since the prevalence of use of asthma action plans in Nyamira is not known Mugenda & Mugenda (1999) recommends a p of 50% and a sample size of 220 patients was used and 6 health care workers to obtain the qualitative data.

## **2.5 Sampling Procedure and Techniques**

The recruitment procedure was purposive sampling for the health care workers despite their ages but gender was considered and systematic probability sampling for the asthmatic patients in which to determine the sampling interval; the total monthly average number of patients was divided by the sample size;  $400/213= 1.8$  hence every 2<sup>nd</sup> patient seen in the clinic was picked (alternate patient) until the sample size of 220 was reached but the first patient was picked using simple random sampling. To maximize variation, male and female patients who meet the inclusion criteria from four age groups i.e. 18–30, 31–40, 41–50 and 51–65 years was used.

## **2.6 Data collection methods and procedures**

The study was carried out for a period of two months to achieve a sample size of 220 patients because from the hospital records; average of 400 patients are seen every month. Interview administered questionnaire was used to capture information from all eligible respondents: both genders, within age bracket of 18 to 65 years who have asthma at any stage and the health care workers who attend these patients participated. The interviews were done on Tuesday and Thursday which is asthma clinic days in Nyamira County and research assistants were used.

## **2.7 Research instrument**

The data was collected using a researcher-made structured study questionnaire. This included data on socio-demographic characteristics, general aspects of asthma and quality of life, professional, clinical characteristics and factors influencing the use of personalized asthma action plans. The questionnaire was self-completed by the health care providers and patients. The validity of the questionnaire was evaluated by experts.

## **2.8 Data Management**

Categorical variables were presented as frequencies and percentage while continuous variables were presented as means and standard deviations (SD). Socio-demographic characteristics, professional and clinical characteristics, and the institutional factors for providing WAAP were compared between health care providers who use and those who did not use PAAPs for asthma patients. Chi-square was used to detect significant differences in categorical variables while z-test was used to detect significant differences in continuous variables. Qualitative data was analyzed using Nvivo software and was presented in thematic areas. To identify factors independently associated with providing PAAP, multivariate logistic regression analysis models was run after adjusting for the variables that were significantly associated with providing PAAP in univariate analysis.

### 3.RESULTS

#### 3.1 Prevalence on usage of asthma action plans.

From the respondent's majority of the patients were found not to be using the personalized asthma action plan cards which were represented by a response rate of 168(76.4%) respondents while those who used were 52(23.6%) respondents.

#### 3.2 Patient Knowledge on the factors influencing use of PAAPs

Majority of the patients indicated that they have never heard about asthma action plans; which were represented by a response rate of 160 (72.7%) respondents while those who have heard about it were 60 (27.3%) respondents hence indicating low knowledge on personalized asthma action plan among the patients.

**Table 1: Patient Knowledge on the factors influencing use of PAAPs**

Test Item		F	%
Have you ever heard about personalized asthma action plan?	Yes	60	27.3%
	No	160	72.7%
Explain what it is	An asthma card	25	41.7%
	An appointment card	4	6.7%
	Instructions given on what to do when I have an attack	31	51.7%
	Others	0	0.0%
The last time you had an exacerbation did you go to the hospital?	Yes	161	73.2%
	No	59	26.8%
What did you do before going to the hospital?	Increased the dose of my reliever inhaler	75	46.6%
	Increased the dose of my oral medication	83	51.6%
	Inhaled hot steam	3	1.9%
	Other	0	0.0%
What is the use of personalized asthma action plans?	To check medications, one is supposed to use	20	23.3%
	It guides on what to do when one has an attack	46	53.5%

To check the next appointment date	20	23.3%
Other	0	0.0%

### 3.3 Attitude of the patients' factors influencing use of asthma action plans among adult asthmatic patients

The attitude was determined among the patients using Likert scale and the following results were obtained. Majority of the patents indicated that the use of PAAPs should be used for the very sick people where the respondents who indicated strongly agree and agree were indicated a response rate of 52 (24.0%) and 86 (39.6%) respondents respectively while those who disagreed and strongly disagree were indicated by a response rate of 63 (29.0%) and 16 (7.4%) respondents respectively.

Most of the respondents disagreed that the use of PAAPs does not improve asthma management with a response rate of 89(41.0%) respondents while those who agreed that PAAPs does not improve asthma management were 87(40.1%) respondents. A response rate of 28(12.9%) and 13(6.0%) respondents indicated strongly agree and strongly disagree on use of PAAPs does not improve asthma management. Majority of the respondents indicated that they disagree with PAAPs tools are meant for healthcare workers and not patients which was represented by a response rate of 139(64.1%) followed by those who agreed with a response rate of 38(17.5%) respondents while the rest of respondents indicated strongly agree, neutral and strongly disagree with a response rate of 12(5.5%), 15(6.9%) and 13(6.0%) respondents respectively. Majority of the patents indicated that use of PAAPs tools make your consultation time with your doctor longer and tiresome where majority strongly agreed with a response rate of 93(42.9%) respondents by those who agreed with a response rate of 69(31.8%) of total respondents while low respondents who disagreed and strongly disagree with a response rate of 41(18.9%) and 3(1.4%) respondents.

**Table 2: Patient Attitude on the factors influencing use of PAAPs**

Test Item	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%	F	%
PAAPs should be used for the very sick patients.	52	24.0	86	39.6	0	0.0	63	29.0	16	7.4
Use of PAAPs does not improve asthma management	28	12.9	87	40.1	0	0.0	89	41.0	13	6.0
PAAPs tools are meant for healthcare workers and not patients	12	5.5	38	17.5	15	6.9	139	64.1	13	6.0
PAAPs tools make your consultation time with your doctor longer and tiresome	93	42.9	69	31.8	11	5.1	41	18.9	3	1.4

### 3.4 Practices of the patients' factors influencing use of asthma action plans among adult asthmatic patients

The study found out that from a sample of 220 patients those who had PAAPs card were 52(23.6%) despite having asthma while those who didn't have were 168(76.4%) respondents. From a sample of 52 patients who were found to have a PAAPs card those who used to check for their card at home were 20 while those who would check on occasionally were 28 while 4 didn't check their card. From those 52 respondents those who used their asthma action plans when you visit the hospital were 45 while 7 didn't use them

**Table 3: Cross tabulation on the Practices of the patients' factors influencing use of asthma action plans among adult asthmatic patients with PAAPs card**

Do you usually use/check your card at home?	Yes	20	20
	No	4	4
	Occasionally	28	28
<b>Total</b>		<b>52</b>	<b>52</b>
Do you carry your asthma action plans when you visit the hospital?	Yes	45	45
	Occasionally	7	7
<b>Total</b>		<b>52</b>	<b>52</b>

### 3.5 Inferential statistics on the Patients' factors influencing use of asthma action plans

A Persons chi square was used to determine if there is any statistical relationship on the various factors that influencing use of asthma action plans among adult asthmatic patient and the results were represented on table 4 below;

**Table 4: Chi-square test association between the various patients'**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.919 <sup>a</sup>	3	.821
Likelihood Ratio	1.062	3	.786
Linear-by-Linear Association	.210	1	.646
N of Valid Cases	244		

Study Outcomes of a chi-square to determine if there is statistically significant association between the various patients' factors influencing use of asthma action plans among adult asthmatic patients and the study found that ( $\chi = .919, p = 0.021 > 0.05$ ) this indicates a there is a statistical relationship between the parameters that influence asthma action plan at 95% confidence interval. Researches have concluded that patients diagnosed with asthma should be taking the medications as prescribed by the doctor. The patients are also advised to keep their inhalers close as this is one of the ways of managing the condition (Gatheral et al, 2017).

The study done by (Bateman et al., 2008) their recommendations have primarily centered on effective treatment alternatives, more study is required to better understand asthma management challenges from the patient's perspective, such as medication nonadherence. Understanding from such study could greatly aid patient education, which in turn could result in patients managing their asthma more effectively.

A further study reported the asthma control rate to be 61.5% in the first visit, in the outpatient patients with persistent and high risk asthma (Yildiz & Atit, 2013). Besides, from the follow up visits, the asthma control rate had increased to 87.3% in the sixth visit. Another research was conducted, where 106 patients were used as the study sample. Majority of the respondents' age was ranging between 36-45 years. From the findings, 59% of the asthmatic patients were not adhering to the drugs given, and some of the reasons they gave were being preoccupied with tasks and forgetting to take the drugs (Koyra & Chinasho,2019). This means that in most cases, the patients participate directly to the severity of the asthma conditions.

#### **4. DISCUSSION**

Majority of the patients indicated that they have never heard about personalized asthma action plan which were represented by a response rate of 160(72.7%) respondents while those who had ever heard about it were 60(27.3%) respondents hence indicating low knowledge on personalized asthma action plan among the patients. According to Gatheral et al. (2017) they indicated between individuals who receive only schooling and those who also use a PAAP. This result held true for all outcomes, including changes in symptom scores and quality of life as well as having to visit the hospital because their asthma got worse. Further the study reported participants who reported having at least one exacerbation that required a trip to the ER or hospitalization No statistically significant difference was found between participants receiving PAAP and those not receiving PAAP in five studies involving 1385 participants in terms of the number of exacerbations necessitating an ED visit or hospitalization (odds ratio (OR) 0.75, 95% confidence interval (CI) 0.45 to 1.24)

The attitude on use of these tools was poor since majority of the patents indicated that the use of PAAPs should be used for the very sick people where the respondents who indicated strongly agree and agree were indicated a response rate of 52(24.0%) and 86(39.6%)

respondents respectively while those who disagreed and strongly disagree were indicated by a response rate of 63(29.0%) and 16(7.4%) respondents respectively. Most of the respondents disagreed that the use of PAAPs does not improve asthma management with a response rate of 89(41.0%) respondents while those who agreed that PAAPs does not improve asthma management were 87(40.1%) respondents. A response rate of 28(12.9%) and 13(6.0%) respondents indicated strongly agree and strongly disagree on use of PAAPs does not improve asthma management. Practice on is still low; from a sample of 52 patients who were found to have a PAAPs card those who used to check for their card at home were 20 while those who would check on occasionally were 28 while 4 didn't check their card. From those 52 respondents those who used their asthma action plans when you visit the hospital were 45 while 7 didn't use them. Increasing patient medication adherence is essential for the best possible management of asthma because the use of many drugs at various points throughout the course of the disease is necessary for adequate management of the condition. Effective levels of medication adherence improve health outcomes while reducing negative drug effects, disease progression, and medical expenses.

## **5. CONCLUSION**

From the respondent's majority of the patients were found not to be using the personalized asthma action plan cards which were majority respondents than those who used respondents. Lack of knowledge was a leading factor among the patient's respondents where the study indicated that who have not heard about them while some of the patients have never heard about it. There was also a poor attitude reported in the patients' respondents in which majority felt that they were for very sick patients; Majority of the patents indicated that the use of PAAPs should be used for the very sick people. The practice was poor even for those few who had these tools; in which from a sample of 52 patients who were found to have a

PAAPs card those who used to check for their card at home while low count among the respondents who didn't check their card.

## **6. RECOMMENDATION**

Prevalence on usage of asthma action plans among adult asthmatic patients is very low from the study and therefore the biggest asset for change is public knowledge, hence the ministry of health should be involved in creating awareness through national media. Patients should have free access to patient education materials regarding asthma

## **CONSENT AND ETHICAL APPROVAL**

The study was approved by Mount Kenya (MKU) Institutional Research Ethics and Review Committee (IREC) of reference number MKU/ERC/2075. Permit to carry out the study was provided by National Commission for Science, Technology, and Innovation (NACOSTI) of license number NACOSTI/P/22/17635. Legal documents required to conduct the research were sought from the county government of Nyamira. Discretion of the respondent's information was vastly upheld by conducting the study in a private set-up. Respondents' participation was purely voluntary. The anonymity of the participants was maintained as only identification numbers and no identifiers were used.

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## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

### **Authors' contributions**

This work was carried out in collaboration among all authors. Authors OLT, and SJ came up with the concept. The proposal was conceived by authors OLT, MF and SJ. OLT, MF and SJ worked together to create the proposal, collect and analyze data. The manuscript was written by OLT. MF and SJ revised the paper. The last draft was approved by all authors.

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