FACTORS INFLUENCING USE OF PERSONALIZED ASTHMA ACTION PLANS AMONG ADULT PATIENTS AGED 18-65 IN NYAMIRA COUNTY 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 factors influencing the use of personalized asthma action plans among patients aged 18-65 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. Findings showed that majority did not use PAAPs with a response of 168(76.4%) respondents while those who used were 52(23.6%). Knowledge on PAAPs was low at 160(72.7%) against, 60(27.3%) who were knowledgeable. There was poor attitude and practices on use of PAAPs. Statistically there were significant association between the various patients' factors influencing use of asthma action plans among adult asthmatic patients with a $p = 0.021$.Among the health care givers, on knowledge of PAAPs 3 had knowledge while 3 did not. Among those who had knowledge the practice on use was low in which majority indicated that they don't discuss and prescribe PAAPs with a response of 5 while 1 do. Statistically there were significant association on the health care workers'

factors influencing use of PAAPs at p = 0.03. Lack of training was a key institutional factor hindering use in which 3 (60.0%) had received training in the last 6 months while 2(40.0%) had not received. Statistically there were significant association on the institutional factors influencing use of PAAPs at p = 0.004.

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.

Among the health care givers; only one out of the six had this template/card in their office. Although half of the health care givers had general knowledge but it was not demonstrated in the use of PAAPs hence showing a gap in some specific skills needed. More workload and lack of these templates in the clinics were the major institutional factors hindering use of these tools.

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 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). Symptoms include cough and breathlessness which may be intermittent or persistent (BTS/SIGN 2016). Triggers may be allergic (e.g. pollen, animal dander, dust mite) or non-allergic (e.g. exercise, smoking, cold air, smoke from fires in confined living spaces). The disease may be characterized by repeated exacerbations requiring a change to normal maintenance therapy. Treatment of people with asthma includes avoidance of potential triggers (when possible), use of inhaled corticosteroids (ICSs) and leukotriene receptor antagonists (LTRAs) to reduce airway inflammation and use of inhaled long-acting beta2-agonists (LABAs), short-acting beta2-agonists (SABAs) and anticholinergic bronchodilators (i.e. long-acting muscarinic antagonists (LAMAs)) to relieve airflow limitation (BTS/SIGN 2016; GINA 2016; NICE 2007; NICE 2013)

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. Many studies report prevalence rates based on single cross-sectional analyses not accurate for evaluation of trends, and probably the real prevalence is underestimated (Adeloye D et al., 2013). Studies in South Africa, Nigeria, Tanzania and Cameroon have reported prevalence of 3.8%, 2%, 3.3% and 2.7%, respectively (Pefura-Yone EW, et al.2015)

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. The

prevalence of asthma in Nairobi was found to be 17.1% while the prevalence in Eldoret was 10.4%. This could be due to the effects of increased urbanization and industrialization. While clinical experience indicates that asthma is a common reason for health resource utilization there is no data on the burden of asthma that is routinely managed in the health care system (Guidelines for asthma management in Kenya 2011)

Most asthma-related deaths occur in low- and middle-income countries. WHO estimates, there were 417,918 deaths due to asthma at the global level and 24.8 million DALYS attributable to Asthma in 2016 (WHO, 2020)

Asthma action plans, together with asthma education and regular follow up can improve the patients' quality of life and reduce hospitalization. (Andrew K. et al., 2019)

Written action plans for asthma facilitate the early detection and treatment of an asthma exacerbation. International asthma guidelines recommend that all patients receive a written AAP (GINA 2016) but despite these recommendations, asthma action plans are not adequately used.

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^{nd} 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

3.1Prevalence on usage of asthma action plans among adult asthmatic patients.

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. Out of the 52 who used these tools; female respondents were 27 and male respondents were 25.

Table 1: Usage of personalized asthma action plan card

Test Item		F	%
Do you have a personalized asthma action plan card?	Yes	52	23.6%
	No	168	76.4%

Table 2: Cross tabulation Usage of personalized asthma action plan card

Add how often do you use it * What is your age bracket Cross tabulation

Count

		What is your age bracket					
		18-28 years	29-38 years	39-48 years	49-58 years	59-65 years	Total
Add how often do you use it	Always	14	3	0	3	3	23
	Sometimes	17	8	1	3	0	29
Total		**31**	**11**	**1**	**6**	**3**	**52**

3.2 Patients' factors influencing use of asthma action plans

3.2.1 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 plans among the patients.

Table 3: 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%

3.2.2 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 by a response of 52 (24.0 %) and 86 (39.6%) responds 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 4: 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

3.2.3 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 5: 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
Total		**52**	**52**
Do you carry your asthma action plans when you visit the hospital?	Yes	45	45
	Occasionally	7	7
Total		**52**	**52**

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3.2.4 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 6 below;

Table 6: Chi-square test association between the various patients'

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.919[a]	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.

3.3 Assessment of the health care workers' factors influencing use of asthma action plans

3.3.1 Prevalence of PAAPs templates among health care workers

Prevalence of PAAPs among the health care workers was low in which those who had personalized asthma action plan cards/templates in their office was only one health care officer with a response rate of 1(16.7%) while the remaining percentage had no personalized asthma action plan cards/templates in your office and the one medical officer who had it indicated that he/she have used it.

3.3.2Knowledge of the Health care workers factors on use of PAAPS that influencing use of asthma action plans

Table 7: Knowledge of the Health care workers factors on use of PAAPS that influencing use of asthma action plans

Test Item		F	%
Have you ever heard about	Yes	3	50.0%

personalized asthma action plan?	No	3	50.0%
What is the use of asthma action plans tools?	It's a written guide given to the patient as part of self-management	4	66.7%
	Are plans given to the showing what patient is to do based on peak-flow measures and or symptoms.	1	16.7%
	These are patient's appointment cards	1	16.7%
	Others	0	0.0%
Have you had any post basic training on asthma?	Yes	4	66.7%
	No	2	33.3%
What type of training was is it?	Short course	1	25.0%
	Post basic diploma	2	50.0%
	Others	1	25.0%
How many years have you been attending asthmatic patients?	Less than one year	1	16.7%
	1-5 years	2	33.3%
	5-10 years	2	33.3%
	More than 10 years	1	16.7%

The study found that half of the health care givers indicated that they have heard about personalized asthma action plan with a response rate of 3(50.0%) respondents and similarly 3(50.0%) indicated that they have never heard about it. On response on what personalized asthma action plan tool was, majority of the health care workers indicated that personalized asthma action plan is a written guide given to the patient as part of self-management with a response rate of 4(66.7%) while others respondents indicated that they are patient's appointment cards with a response rate of 1(16.7%) similarity to respondents who indicated that they are plans given to the showing what patient is to do based on peak-flow measures and or symptoms. The study found out that the majority of health care workers had basic training on asthma with a response rate of 4(66.7%) respondents while 2(33.3%) respondents didn't have training. Where majority had trained at a post basic diploma with a response rate of 2(50.0%) response rate while

1(25.0%) indicated that he/she had trained it as the short course and other course respectively. The study found that majority of the health care workers had an average of 1 – 5 years and 5 – 10 years since they started attending asthmatic patients with a response rate of 2(33.3%) respondents each while those who had less than one year and more than 10 years were 1(16.7%) respondents' rate each.

3.3.3 Attitude of the Health care workers factors on use of PAAPS that influence use of asthma action plans

Table 8: Attitude of the Health care workers factors on use of PAAPS that influence use of asthma action plans

Test Item		F	%
Do you always issue PAAPs to all asthmatic patients?	Yes	1	16.7%
	No	5	83.3%
What are some of the reasons why you don't issue PAAPs to your patients?	They don't add any value in the management of asthma	0	0.0%
	Most patients will not bring them in next visit	2	33.3%
	Patients don't understand the language used in it	2	33.3%
	Others	2	33.3%

Source field Data (2022)

Most of the health care workers indicated that they always issue PAAPs to all asthmatic patients with a response rate of 1(16.7%) while those who indicated no were represented by a response rate of 5(83.3%) respondents. Majority of the health care workers indicated that some of the reasons why they don't issue PAAPs to the patients was that, most patients will not bring them in next visit with a response rate of 2(66.7%) while other health care worker indicated patients don't understand the language used in it with a response rate of 1(33.3%) response while 3(50.0%) of the respondent indicated other reasons.

3.3.4Practice of the Health care workers factors on use of PAAPS that influence use of asthma action plans

Table 9: Practice of the Health care workers factors on use of PAAPS that influencing use of asthma action plans

Test Item		F	%
Do you discuss and prescribe PAAPs for your patients?	Yes	1	16.7%
	No	5	83.3%
Which format do you always use?	Oral	1	100.0%
	Written	0	0.0%
	Others	0	0.0%
Have you ever reviewed a PAAPs card?	Yes	2	33.3%
	No	4	66.7%
When preparing, do you involve patients?	Yes	2	33.3%
	No	4	66.7%
	Others	0	0.0%

Majority of the health care workers indicated that they don't discuss and prescribe PAAPs for their patients with a response rate of 5(83.3%) respondents while 1(16.7s%) do. The one health care giver who discusses it with the patient do it orally. Concerning review of PAAPs 4(66.7%) of the health care workers indicated that they had never reviewed a PAAPs card while 2(33.3%) had reviewed the card of the patients. The study found that when majority of the health care workers don't involve the patients while preparing the PAAPs with a response rate of 4(66.7%) while those who involved the patients were 2(33.3%) respondents of health care workers.

3.3.5 Inferential analysis on the assessment of the health care workers' factors influencing use of asthma action plans.

The chi square was determined on the assessment of the health care workers' factors influencing use of asthma action plans in Nyamira County Referral Hospital and results were presented per the table 10 below;

Table 10: Fisher's Exact Test on the assessment of the health care workers' factors influencing use of asthma action plans

Chi-Square Tests					
	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.750[a]	3	.386		
Continuity Correction[b]	.000	3	1.000		
Likelihood Ratio	1.046	1	.306		
Fisher's Exact Test				.030	.667
Linear-by-Linear Association	.500	1	.480		
N of Valid Cases	3				

The Fisher's Exact Test was performed and the results obtained indicated that there was a statistical relationship on the assessment of the health care workers' factors influencing use of asthma action plans since the p value obtained was 0.03 which is less than 0.05 at 95% confidence interval.

The health workers' related factors can be controlled by ensuring a greater patients' involvement in the action plans, reviewing and discussing the goals and the priorities that the patients may be having regarding their conditions and the control plans (Vos et al, 2017).

3.4 Institutional factors influencing use of asthma action plans.

Table 11: Institutional factors influencing use of asthma action plans among adult asthmatic patients

Test Item		F	%
Have you been trained on use of PAAPs?	Yes	5	83.3%
	No	1	16.7%
When was the training done?	1-6 months ago,	3	60.0%
	6months -1 year ago	2	40.0%
	1-2 years ago,	0	0.0%
	More than 2 years ago	0	0.0%

In a normal clinic day, how many patients do you attend?	1-20 patients	5	83.3%
	20-40 patients	1	16.7%
	40-60 patients	0	0.0%
	More than 60 patients	0	0.0%
Routinely how many staffs are on duty (doctors, clinical officers and nurses)?	1-2	3	50.0%
	2-4	3	50.0%
	More than 4	0	0.0%
On average how long do you take to attend one patient who is on routine follow up?	Less than 5 minutes	1	16.7%
	5-10 minutes	2	33.3%
	More than 10 minutes	3	50.0%
Do you have PAAPs forms in the clinic?	No	5	83.3%
	Yes	1	16.7%
When did you review them last?	1-3 months ago,	3	50.0%
	3-6 months ago,	3	50.0%
	More than 6 months ago	0	0.0%

Majority of the heath care workers indicated that they have been trained on the use of PAAPs with a response rate of 5(83.3%) while 1(16.7%) was not trained. Concerning when the training was done, majority of the health care workers indicated they had the training for the last between 1 – 6 months ago with a response rate of 3(60.0%) while 2(40.0%) did their training for the last 6 months – 1 year ago. On workload majority of the heath care workers 5(83.3%) indicated that they normally handle 1 – 20 patients in a normal clinic day but one health care worker indicated he/she could handle even 20 – 40 patients. The study indicated that routinely the number staffs (doctors, clinical officers and nurses) who were on duty were 1 – 2 with a response rate of 3(50.0%) respondents and 2 – 4 with a response rate of 3(50.0%). On the average time taken to attend to one patient who is on routine follow up, majority of the respondents took more than 10 minutes with a response of 3(50.0%) respondent those who would take 5 – 10 minutes and less than 5 minutes were 2(33.3%) and 1(16.7%) respondents respectively. 5(83.3%) of the health care workers indicated that they did not have PAAPs forms in the clinic while 1(16.7%) indicated had PAAPs forms in the clinic and regarding time

they had taken to review them last was between 1 – 3 months ago 3(50.0%) and 3 – 6 months ago with a response rate of 3(50.0%) respondents.

3.4.1 Inferential analysis of the institutional factors influencing use of asthma action plans

A fisher's exact test was formulated to identify is there any statistical relationship between institutional factors influencing use of asthma action plans among adult asthmatic patients and the health care officers and the results were presented on table 12 below;

Table 22: Fisher's Exact Test on the identification of the institutional factors influencing use of asthma action plans among adult asthmatic patients

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.000[a]	1	.083		
Continuity Correction[b]	.188	1	.665		
Likelihood Ratio	3.819	1	.051		
Fisher's Exact Test				.004	.333
Linear-by-Linear Association	2.000	1	.157		
N of Valid Cases	3				

From the results on table 12 the value of Fisher's Exact Test was found to be 0.004 which is less than 0.05 this indicates that there existed a statistical relationship institutional factors influencing use of asthma action plans among adult asthmatic patients at 95% confidence interval. Since the P value is lesser than the statistical value.

From a study conducted to determine the factors associated with poor asthma control in clinic setting, it was found that there was an issue with inappropriate use of devices by the patients. These findings gave a p-value of 0.001, which was a proof of the statistical significance in the study (Miles et al, 2017). Conversely, asthma control did not show any relationship with the regular follow ups, clinic visits, or bedroom carpets.

4.0 DISCUSSION

4.1 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.

The study also indicated that majority of the patients who used their personalized asthma action plan card were aged between 18 – 28 years for both always and sometimes response with a response rate of 14 and 17 respectively from a sample of 52 respondents who were found to be having personalized asthma action plan card. Between the ages of 29 – 38 years there were 3 and 8 respondents who indicated always and sometimes response on how often they use it.

From the respondent's majority of the patients were found not to be using the personalized asthma action plan cards. In a study done by Gatheral et al. (2017); indicated that when comparison was done between those who were utilizing PAAPs to those who weren't utilizing PAAPs; those who were using didn't exhibit any difference (positive or negative) in having to visit the hospital because their asthma got worse. The number of asthma-related deaths and changes in asthma symptom scores both led to the same conclusion. 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)

4.2 Patients' factors influencing use of asthma action plans.

According to the good definition of personalized asthma action plan that was provided, majority stated that it is a set of instruction given on what to do when one has an attack which had a response rate of 31(51.7%) followed by those who indicated is an asthma card with a response rate of 25(41.7%) while 4(6.7%) of the respondents indicated it is an appointment card.

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

Regarding practices majority of the patients indicated that the last time they had an exacerbation they did go to the hospital which was represented by a response rate of 161(73.2%) respondents while those who didn't go were represented by a response rate of 59(26.8%) respondents.

Knowledge on usage of asthma action plans was low. According to Gatheral et al., (2017); the level of education did not determine the outcome or how well the symptoms were controlled. 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. This contrasts a study by (Hassan F, et al.,2018) which found out that that use of asthma action plans had positive outcomes in asthma severity, control and exacerbations. Patient education and use of asthma action plans in outpatient produced

significant improvements in clinical outcome measures between those using these plans and controls. 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. A study done by (Nicola Ring, et al., 2015) found out that all the 11 patient participants felt that use of PAAPs were not suitable or appropriate for use by all those with asthma and when asked if they could be of value to others, it depends on the severity, duration and literacy of the patient.

4.3 Health care workers' factors influencing use of asthma action plans.

The study found out that the prevalence of PAAPs among health care workers was low since those who had personalized asthma action plan cards/templates in their office was only one health care officer with a response rate of 1(16.7%) while the remaining percentage had no personalized asthma action plan cards/templates in their office.

The attitude was poor since Majority of the health care workers indicated that some of the reasons why they don't issue PAAPs to patients was that; most patients will not bring them in next visit with a response rate of 2(66.7%) while other health care worker indicated patients don't understand the language used in it with a response rate of 1(33.3%) response while 3(50.0%) of the respondent indicated other reasons.

Concerning review of PAAPs 4(66.7%) of the health care workers indicated that they had never reviewed a PAAPs card while 2(33.3%) had reviewed the card of the patients.

Majority of the heath care workers indicated that they have been trained on the use of PAAPs, however this did not reflect on the usage of PAAPs this shows that there is a gap in knowledge hence specific skills are required. A study done by (Ping Yein Lee et al., 2021) on Barriers to implementing asthma self-management in Malaysian primary

care in which 26 health professionals were involved found out that there were gaps in; Health care knowledge whereby the health care workers need specific skill-based training. There was also poor attitude among the healthcare providers whereby some felt that even if their colleagues are trained, they will never implement these action plans. Some HCPs felt that their colleagues were not motivated to empower patients for self-management even if they had been trained in delivery of action plans, which led to poor attitude towards implementing it.

4.4 Institutional factors influencing use of asthma action plans.

Majority of the heath care workers indicated that they have been trained on the use of PAAPs with a response rate of 5(83.3%) while 1(16.7%) was not trained. Concerning when the training was done, majority of the health care workers indicated they had the training for the last between 1 – 6 months ago with a response rate of 3(60.0%) while 2(40.0%) did their training for the last 6 months – 1 year ago. On workload majority of the heath care workers 5(83.3%) indicated that they normally handle 1 – 20 patients in a normal clinic day but one health care worker indicated he/she could handle even 20 – 40 patients. The study indicated that routinely the number staffs (doctors, clinical officers and nurses) who were on duty were 1 – 2 with a response rate of 3(50.0%) respondents and 2 – 4 with a response rate of 3(50.0%). On the average time taken to attend to one patient who is on routine follow up, majority of the respondents took more than 10 minutes with a response of 3(50.0%) respondent those who would take 5 – 10 minutes and less than 5 minutes were 2(33.3%) and 1(16.7%) respondents respectively. 5(83.3%) of the health care workers indicated that they did not have PAAPs forms in the clinic while 1(16.7%) indicated had PAAPs forms in the clinic and regarding time

they had taken to review them last was between 1 – 3 months ago 3(50.0%) and 3 – 6 months ago with a response rate of 3(50.0%) respondents.

Lack of PAAPs templates and more work load were among the institutional factors hindering use of PAAPs in this study. A study done by (Nicola Ring, et al., 2015) found out that professionals had challenges retrieving and use of these PAAPs. There was more work load that couldn't allow professionals to go through PAAPs.

According to study by (Ping Yein Lee et al., 2021), some health care workers had competing tasks, there was limited availability of resources (asthma action plans) in consultation rooms.

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.

Among the health care givers; only one out of the six had this template/card in their office. Although half of the health care givers had general knowledge but it was not demonstrated in the use of PAAPs hence showing a gap in some specific skills needed. More workload and lack of these templates in the clinics were the major institutional factors hindering use of these tools.

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 national media should be involved. Patients should have free access to patient education materials regarding asthma.

The health care givers need to update their knowledge includes exposing them to the application of asthma guidelines, educating their peers about the most recent advancements in research, and providing them with strategies to help them alter their own attitudes and beliefs. A favorable shift in behavior could result from having the proper information that will improve patient care. The health care givers also need to change their attitude on the importance of these tools and this can be achieved by offering on job training and refreshers courses.

The hospitals need to develop a better treatment strategy with adequate asthma action templates and work force to minimize exhaust at the work place.

There is need for further studies to be done on; how best to encourage health professionals and asthmatic patients to promote use of asthma action plans, suitability and characteristics of asthma action plans and digitization of asthma action plans.

LIST OF ABBREVIATIONS

COPD	Chronic Obstructive Pulmonary Disease
DALYS	Disability Adjusted Life Year
ED	Emergency Department
ERS	European Respiratory Society
GINA	Global Initiative for Asthma
HCP	Health Care Professional
ISAAC	International Study of Asthma and Allergies in Childhood
NACOSTI	National Commission for Science, Technology and Innovation
NICE	National Institute for Health and Care Excellence
PAAP	Personalized Asthma Action Plan
WHO	World Health Organization

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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