

**An assessment of knowledge and  
comprehension of asthma therapy among  
guardians of asthmatic children at KNH  
paediatric asthma clinic**

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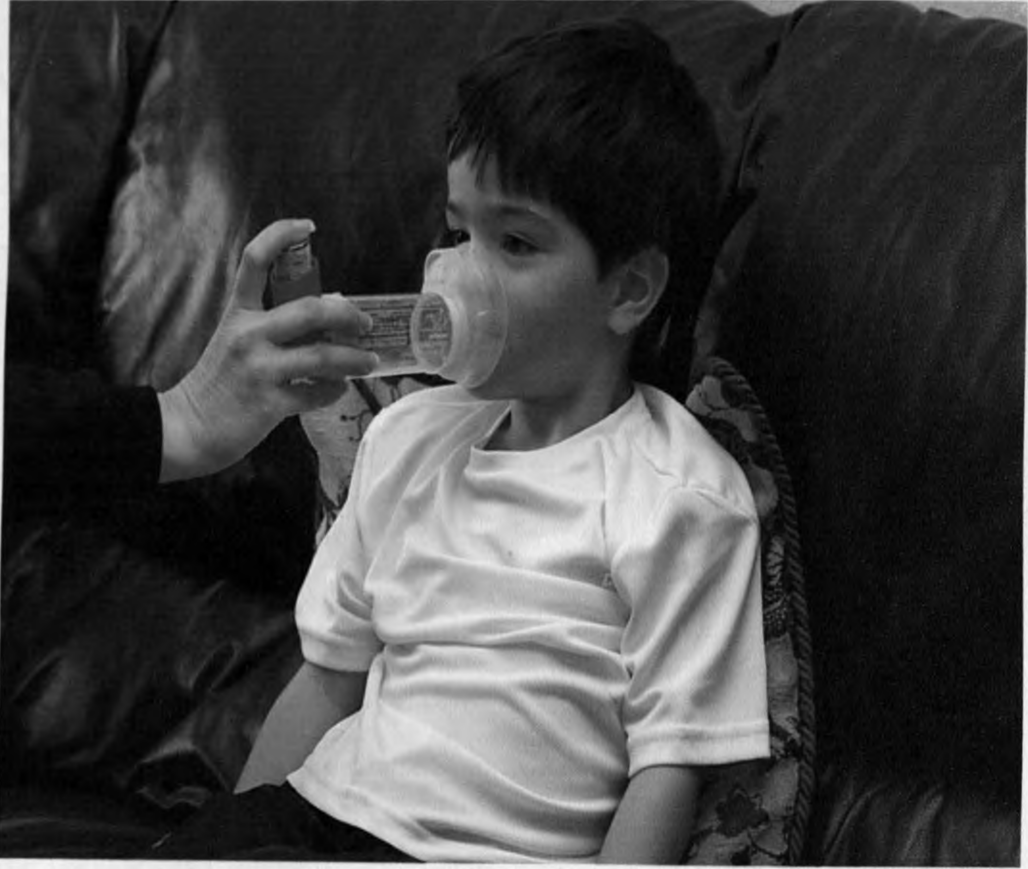
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## DEDICATION

This work is dedicated to my daughter Victoria Amani and son Ryan Imani; your beautiful smiles kept me going.



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## LIST OF ABBREVIATIONS

|                  |  |
|------------------|--|
| FEV <sub>1</sub> | Forced expiratory Volume in one second     |
| PEF              | Peek expiratory flow                       |
| MDI              | Metered dose inhaler                       |
| ED               | Emergency Department                       |
| PCE              | Patient-Centred Education                  |
| SPE              | Standard Patient Education                 |
| ETS              | Environmental tobacco smoke                |
| USA              | United States of America                   |
| SPSS             | Statistical programme for social scientist |
| KNH              | Kenyatta National Hospital                 |

## DEFINITION OF TERMS

**Therapy**.....The process involved in management of asthma.

**Guardian/ Carer**.....An individual involved in management of asthma in a child.

**Knowledge**.....Being aware/ understanding of something.

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## **ABSTRACT**

Due to an increasing urbanisation, industrialization and progressive changes in the style of living in developing countries like Kenya, an increase in asthma morbidity is expected and especially in the young who form majority of the population.

It is therefore of paramount importance to focus on asthma management and specifically in children who mainly require assistance from their carers.

**Purpose:** This study aimed to assess understanding of asthma therapy among guardians of asthmatic children and thereby promote patient education on asthma symptoms, its trigger factors and proper drug management.

**Goal of Study:** To contribute to the promotion of asthma awareness among guardians of asthmatic children and improve asthma management by ascertaining the current state of awareness among guardians of KNH patients.

**Study Design:** This was a hospital-based prospective cross-sectional study.

The data were collected using an interview questionnaire designed and validated for the purpose.

**Study Population:** Guardians of children aged below 12 years with a diagnosis of asthma.

**Sampling Procedure and Size:** Every guardian of an asthmatic child seen at the paediatric chest clinic who consented to participate, was administered a questionnaire after explaining the purpose and getting their voluntary consent. A total of 140 guardians were studied.

**Data Analysis:** The data collected were analyzed using SPSS version 13.0 software and then presented as tables, graphs and pie charts to demonstrate the level of knowledge of asthma therapy by guardians of children with asthma.

## **Results**

After assessing on asthma therapy in guardians of asthmatic children, it was found the majority of guardians, 62.8% had an average knowledge on asthma symptoms, 35% had good knowledge while 2.1% had poor knowledge of the symptoms.

Concerning asthma trigger factors, 65% of the guardians had good knowledge, while 34.3% had average knowledge. A small percentage (0.7%) had poor knowledge of the triggers.

Concerning knowledge of asthma drugs and administration, 87.2% had good knowledge of names of drugs prescribed, 80.9% knew the correct way of using MDI devices and 29.1% knew the purpose of the prescribed drugs.

## **Conclusions**

The guardians had better understanding on education of asthma triggers factors compared to asthma symptoms. Education on the names of the medicines prescribed and the proper use of metered dose inhaler and spacer devices was well understood as the guardians scored high in this assessment. However, knowledge on the purpose of the medicines prescribed was poor among guardians with a low score of 29.1%.

## **Recommendations**

A more intensive education on all asthma symptoms to be observed in children was necessary during the initial visits at the clinic and reminder trainings in subsequent visits.

A pharmacist should be involved in the asthma education at the paediatric clinic for proper explanation on purposes of asthma drugs and any other advice involving the drugs like expected adverse reactions.

## 1.0 INTRODUCTION

### 1.1 Background:

Asthma is a chronic, inflammatory disorder of the airways in which many cells and cellular elements play a role. The chronic inflammation causes an associated increase in airway hyper responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night or in the early morning<sup>[6, 7, 9]</sup>. These episodes are usually associated with widespread but variable air-flow obstruction that is often reversible either spontaneously or with treatment.

Asthma occurs most frequently in children and young adults before the age of 45 years, but it can occur at any age. In children, the sex distribution is on average two boys for every girl while in adults the prevalence is higher in women than in men<sup>[9]</sup>. In low or middle income countries, an increase in asthma morbidity is expected due to the young age of the population.

Despite a better understanding of the disease and the availability of more effective treatment, an increase in the rate of avoidable deaths due to asthma has been noted in the last thirty years, mainly among the young. The most obvious reason for mortality due to asthma is inadequate long term management of patients.<sup>[1, 9, 11]</sup>

As for any chronic disease, successful management of asthma hinges on active and ongoing participation of the family and the patient in his or her daily care<sup>[2, 5, 7]</sup>. Both the family and the physician must recognize that the patient has a chronic disease with intermittent exacerbations rather than a problem needing

only occasional acute interventions. The patient and family must learn to recognize and respond to increasing symptoms. If the family is able and motivated, extensive self-management can be expected. The goals of management are to reduce the number and severity of exacerbations, to normalize activity (school, play, sleep), and to minimize side effects of medications. Home monitoring of peak expiratory flow rates can be a valuable tool in management of the moderate or severe asthmatic.

As is the case for allergic rhinitis, the principal therapies of asthma include avoidance of allergens and other precipitants, pharmacotherapy, and when indicated, immunotherapy<sup>[5,7]</sup>. In addition, because viral respiratory infections are the most frequent causes of wheezing in young children, the infant or young child with significant wheezing triggered by upper respiratory tract infections should not attend day care or even Sunday school nurseries so as to avoid exposure to viral agents. Exercise in cold, dry air should be avoided until the infant or child has been shown to be protected by medication.

Pharmacological therapy of asthma is of great importance even in those who stringently avoid allergens or who receive immunotherapy. The physician and the family should clearly understand the distinction between anti-inflammatory and bronchodilator medications<sup>[1,3,4]</sup>. Management is likely to fall into reproducible patterns for those with mild, moderate, or severe asthma. A stepwise approach is taken to add medication to reach adequate control. The child with recurring but infrequent mild asthma does not require daily medications. Symptoms respond well to the prompt use of oral or (preferably)

inhaled beta-adrenergic agonists (two inhalations with a spacing device every four to six hours, waiting two to five minutes between the first and second inhalations)<sup>[3,7]</sup>. The most important part of treating such a child is careful instruction in and observation of usage of the spacing devices with the metered-dose inhaler (MDI). If there is any question about the patient's ability to use these, either an oral preparation or a home nebulizer should be prescribed. Children with mild asthma may also have exercise-induced wheezing. Beta-adrenergic agonists used by inhalation with such a spacing device 20 to 30 minutes before exercise will prevent symptoms in most such patients<sup>[1,3]</sup>.

By contrast, patients who wheeze twice weekly or more and who cough intermittently between episodes should be considered to have moderate asthma and will do best on a daily anti-inflammatory drug. Without such drugs, exercise usually exacerbates coughing and wheezing. These children often wake at night with symptoms and are frequently absent from school. Such a child can become nearly symptom-free on inhaled corticosteroid, the parents and patient should be aware that these drugs do not relieve asthma symptoms but are strictly prophylactic medications. Inhaled beclomethasone, budesonide, or flunisolide has potent anti-inflammatory effects. These drugs are most commonly used in children with excellent effect. Beclomethasone or budesonide are well absorbed from mucosal surfaces but are rapidly metabolized by the liver into products lacking glucocorticoid activity. Thus, 400ug/day (8 puffs) of beclomethasone or budesonide does not cause adrenal suppression. Other than occasional mild oral candidiasis (which can be avoided by rinsing the mouth after inhalations), side effects have not been seen at the recommended dosage<sup>[3,7]</sup>. The principal

disadvantages of inhaled steroids are that they do not relieve symptoms and that intermittent use has no effect. Thus, if inhaled steroid is prescribed, the medications should be supplemented with an inhaled beta-adrenergic agonist as needed for breakthrough coughing or wheezing.

Choice of a MDI or nebulizer to deliver inhaled drugs depends on patient, family, and drug considerations. For reliable use of MDIs the patient must be able to cooperate with the use of the inhaler and spacer. Beta-adrenergic agonists and inhaled steroids are available both as metered-dose inhalers and in solutions for nebulization. The MDI devices have the virtue of simplicity and portability but are inappropriate in the child who cannot reliably use them unless a guardian of the child is educated on how to administer to the child. Obviously, the use of inhaled medicines in infants and toddlers will require a nebulizer.

Patients with severe asthma may fail to achieve good control despite optimal use of a combination of inhaled anti-inflammatory agents and beta-adrenergic agonists. Patients with chronic, severe asthma have problems participating in normal daily childhood activities or attending school, and they require frequent emergency room or in-hospital treatment. If under-treated they often lead very restricted lives and may have multiple life-threatening exacerbations. For these children, oral steroid therapy has a very important role. However, to minimize side effects of steroids, every effort should be made to avoid prolonged periods of daily steroid administration and to find the lowest possible alternate-day dose needed for optimal control. One approach to beginning steroid therapy is to give short courses of up to 3 weeks high dose steroids, 30 to 60mg daily of

prednisone for four to five days. This can be given in divided doses for the first 48 to 72 hours, but after that should be given as a single morning dose.

Thereafter, the dose can be decreased rapidly on the alternate day (eg, by 5 mg every other day) until strictly alternate-day therapy is achieved <sup>[4]</sup>.

Simultaneously with the taper, inhaled steroid therapy should be initiated. The alternate-day dose can be dropped slowly by 2.5 to 5.0 mg every other day until signs of asthma appear or the peak flow drops. When this occurs, the oral steroid should be kept at that dosage to ensure that the patient's condition is stable. After a week or two, the taper can be resumed, dropping by 2.5 mg every week on the alternate-day schedule <sup>[7]</sup>. Although the goal is to discontinue oral prednisone therapy and rely solely on inhaled steroid for long-term therapy, this is sometimes not always possible.

The importance of patient education cannot be overemphasized: The more patients know about asthma--including knowledge of the disease, what precipitates an attack, what drug to use when, how to use a spacer with a metered-dose inhaler, and how important early intervention with corticosteroids is when asthma worsens--the better they do.

## 1.2 STATEMENT OF THE PROBLEM

Proper management of any disease, including asthma is a collaborative effort of partners which include the physician, the nurse, the pharmacist and patient or their guardians. In order to achieve desired therapeutic goals, each of these partners needs to play their rightful role effectively. Therefore appropriate rational therapy is based on acute diagnosis, rational use of the relevant drugs and includes patient knowledge of the disease, causal factors, medications and proper administration of medications.

If a proper diagnosis of asthma is made and the best medication prescribed, optimum control of asthma symptoms may not be achieved if a thorough patient/guardian education is not offered. The main areas that require a thorough patient education include:

- **Asthma symptoms:** Cough, wheeze, chest tightness, difficulty in breathing, interrupted sleep or missing school due to asthma symptoms.
- **Asthma trigger factors and their respective environmental control:** Smoke and avoidance of smoke, dust mites and frequent cleaning of children fabrics, mould and proper drying or ventilation of child's room, pet dander and avoidance of pets, changes in weather and appropriate dressing of children, noxious odour and their avoidance, pollens and precautions taken.
- **Asthma drug management and administration:** Short-acting inhaled beta2 agonists for symptom relief and long term inhaled preventive medication (steroid), oral steroid, the use of MDIs and spacers.



### 1.3 STUDY JUSTIFICATION

Even though there is immense evidence that knowledge and understanding of a chronic disease such as asthma is paramount for proper disease control, so far there are no documented studies in Kenya for this kind of population available to help determine the appropriate patient/ guardian strategies.

This study was aimed at providing information on the level of knowledge of asthma therapy among guardians of asthmatic children at KNH asthma clinic thereby contributing towards asthma education campaign to improve asthma control in children. If asthma is well controlled, it is hoped to produce positive results in:

- Improving quality of life for asthmatic children, by enabling them to engage in normal childhood activities like sporting, schooling and having uninterrupted night sleep.
- Reducing the cost of therapy resulting from frequent emergency services and hospitalization.
- Enabling the guardians to lead a stress free productive life.
- Lowering the rate of morbidity and mortality due to asthma

## 2.0 LITERATURE REVIEW

Several clinical guidelines <sup>[9,10,11,12,13,14,]</sup>, strategies <sup>[15]</sup> and recommendations have been developed for diagnosis and management of asthma. “Key clinical activities for quality asthma care: recommendations of the National Asthma Education and Prevention Program” <sup>[16]</sup> developed in the USA is one of the recommendations which also emphasizes on importance of routine education on patient self-management as one of its key clinical activity. Due to the differences in demographic growth, socioeconomic factors and urbanization, there is need for development of a clinical guideline tailored towards management of asthma in the local set-up.

Asthma education is essential for successful management of the disease. There are many circumstances where asthma education can benefit asthmatic patients, for instance apart from the conventional oral education during an outpatient clinic, an enhanced education programme based on computerized booklets was found to reduce hospital admissions and improve morbidity among hospital outpatients. A pragmatic randomized trial comparing outcomes over 12 months between patients taking part in an enhanced education programme (intervention group) and patients receiving conventional oral education (control group) at outpatient or surgery visits was conducted at hospital outpatient clinics and general practices in north east Scotland on 801 adults attending hospital outpatient clinics, with a diagnosis of asthma. Patients with asthma judged too severe between clinic care and integrated care and those retained in clinic care had 54% fewer hospital admissions after receiving enhanced education than did the control group 95%. <sup>[17]</sup>.

A patient-centred style of education was found to be more effective in the emergency set-up than the normal standard patient education. High re-attendance rates were found to be common after asthma emergency department (ED) care. This was contributed by inadequate patient education as a potential cause of re-attendance. A study compared the effectiveness of patient-centred education (PCE) and standard asthma patient education on ED re-attendance and found patient-centred education to offer promise as a brief education process in the emergency department. A randomised controlled trial study was conducted at two inner-city Australian teaching hospitals' EDs where patients received either standard patient education (SPE) or PCE. Both groups received a six-topic curriculum. In total, 146 adult patients presenting to EDs with acute asthma were enrolled. After 4 months, ED re-attendance decreased from 22% to 12% in the PCE group and remained unchanged in the SPE group. In 78 patients discharged after ED care, the PCE group had fewer re-attendances after 4 and 12 months. PCE patients with no general practitioner care in the preceding 7 days had fewer re-attendances after 4 and 12 months<sup>[18]</sup>. A trend to better asthma control was evident, with patient-centred education than standard patient education.

Another strategy on effective asthma education was to conduct an asthma education programme to children in their school; this was found to significantly improve quality of life and reduce the burden of childhood asthma. A randomized controlled trial was conducted on twenty-six elementary schools located in a suburb of Toronto. A total of 256 children in grades 2 to 5 with asthma and their parents were randomized to control and experimental groups. Children in the experimental group received the "Roaring Adventures of Puff" asthma education program over the course of six weekly 1-h sessions. Those in

the control group continued receiving usual care. Data collection involved measuring asthma quality of life, self-efficacy for managing asthma, school absenteeism, days of interrupted activity, health services use, and parental loss of time from work. Quality of life and self-efficacy data were collected from the children at baseline and 2 months. Telephone parental interviews conducted over 1 year were used to collect data on the remaining variables. The outcome showed the experimental group demonstrating higher scores than the control group for self-efficacy. At one year, the experimental group demonstrated fewer urgent health-care visits, days of missed school and days of interrupted activity related to asthma than the control group <sup>[19]</sup>.

Sometimes asthma education reinforcements may be necessary to help patients keep abreast with the recent self-management skills. An asthma self-management education programme coupled with educational reinforcement conducted at Ronda in Spain was found to be effective at decreasing asthma morbidity, improving lung function and decreasing consumption of oral steroids in adults. Changes in asthma-related morbidity parameters, lung function and use of different classes of drugs before intervention and after one, two and three years of the asthma education programme were compared using Friedman one-way analysis of variance. The benefits at three yrs of an asthma self-management education programme coupled with educational reinforcement were assessed at follow-up visits in 63 adults with chronic asthma. Improvements in the number of days off work or school, general practitioner consultations, admissions to emergency services, hospital admissions and nocturnal awakenings, as well as increases in forced expiratory volume in one second (FEV<sub>1</sub>), were significant. Comparison of data obtained at one year and two–three years showed significant

differences in the number of asthma-associated sleep disruptions, days off work or school and unscheduled visits to the general practitioner, as well as FEV<sub>1</sub>, but significant differences between the data obtained at two and three years were not observed. The percentage of patients using oral steroids had decreased significantly at three years <sup>[20]</sup>. Asthma self-management education should always be offered during the routine asthma consultations in any health facility irrespective of the number of times the patient may have been educated previously.

In instances of conducting asthma education for large numbers of patients an "asthma school" was found to give positive results in adult asthma patients at a special "asthma school". These patients were studied with regard to knowledge of the disease and its treatment and quality of life measured by leisure activities, social interaction and psychological well being and any differences in number of days in hospital and emergency visits before and one year after the asthma-school. Patients were randomised to an intervention group and a control group. Both groups answered the same standardized and quantified questionnaires on three occasions, before the start of the asthma school, after five months and after twelve months. It was found that both groups increased their knowledge of the disease and how to treat it, with slightly better results in the intervention group. The self-assessments all showed that patients in the intervention group felt better than those in the control group. The numbers of days in hospital as well as acute visits to out-patients clinics were reduced significantly after the asthma school.

[21]

Medical providers may also require special education in developing communication and teaching skills and use of therapeutic medical regimens for asthma as demonstrated in a study on interactive asthma seminars for paediatricians which produced significant long-term benefits for their asthma care <sup>[22]</sup>. In a randomized clinical trial evaluating the long-term impact of an interactive seminar for physicians based on principles of self-regulation on clinician behaviour, children's use of health services for asthma and parent's views of physician performance. The seminar focused on development of communication and teaching skills and use of therapeutic medical regimens for asthma as outlined in the National Asthma Education and Prevention Programme guidelines. Approximately two years post intervention, treatment group physicians were more likely than control physicians to: use protocols for delivering asthma education, write down for patients how to adjust medicines when symptoms change, and provide more guidelines for modifying therapy. Parents scored treatment group physicians higher than control physicians on five specific positive communication behaviours. Children seen by treatment group physicians had fewer hospitalizations and those with higher levels of emergency department (ED) use at baseline had fewer subsequent ED visits.

Effective asthma education is developed in a patient-provider partnership, tailored to the individual patient's needs relative to cultural or ethnic beliefs and practices. A cross-sectional, observational study was used to examine 104 children aged four to nine years and their guardian(s) attending emergency departments in seven cities in the USA. Quantitative analysis of provider-family dialogue was performed. Questionnaires measured satisfaction with care, provider in formativeness, and partnership. The outcome was that providers' talk

to children was largely supportive and directive; parents received most counseling and information while children spoke little to providers (mean: 20 statements per visit versus 156 by parents). In a patient-centered style a correlated increase in parent and child participation was noted, but required directing conversation toward both parents and children <sup>[23]</sup>.

Childcare workers' knowledge and attitudes towards asthma improved through conducting frequent asthma education sessions as in this study conducted by Saville SK, Wetta-Hall R et al. Asthma-management-education sessions were provided for childcare workers from Sonoma County, California where a total of 71 childcare workers came to the sessions. Before and after each session the participants' knowledge, attitudes, and intentions about asthma were assessed and found that Participant knowledge of asthma causes (e.g., air quality, common cold) and interventions (e.g., bronchodilators), asthma trigger control plans, ability to identify a child who needs medical attention for asthma, and comfort level with caring for a child with asthma increased significantly. Their knowledge about asthma triggers, early warning signs, and asthma control plans was high before and after the asthma education intervention. Their stated intentions to utilize their asthma knowledge were high before and after the training <sup>[24]</sup>. This study indicated willingness of childcare workers to implement knowledge and attitude change towards asthma.

Even though some communities showed a high prevalence in asthma, asthma awareness in these communities was still low as discovered in this cross-sectional survey done in five inner-city Chicago communities. A random digital telephone dialing method was used in the cities where a high prevalence and

mortality of asthma had been recognized, to understand inner-city Chicago residents' perception of the prevalence and severity of asthma as well as their knowledge of asthma control and management. The participants' knowledge and beliefs about the seriousness of asthma revealed in this study appeared unlikely to enhance or support compliance with the challenging requirements of the National Asthma Education and Prevention Panel guidelines. Participants having family members with diagnosed asthma scored no better when asked general-knowledge questions about asthma or its signs and triggers than those without a family member having asthma <sup>[25]</sup>. Thus assumptions concerning knowledge of asthma among high prevalence communities should be avoided.

Partridge MR and Hill SR <sup>[26]</sup> found that education in the morbidity associated with asthma required attention to several aspects of the behavior of health professionals and patients, and to the interactions between these two groups. Well-educated health professionals who recognize the person with asthma as an individual, and who gave advice about self-management, were found to significantly reduce the suffering and costs associated with asthma. In their review, what was learnt about health professional/patient communication and patient education (skills, settings and materials), lay and health professional liaison, patient education in low-income countries, the integration of patient education into clinical practice, health professional training and the implementation of guidelines, and the role of national asthma campaigns is drawn together. What changes in public policy would enhance asthma care, and whether the promotion of asthma self-management skills was cost effective were also considered. Health professionals, patients and the general public should be



encouraged to work together in reducing stigma towards asthma by creating asthma awareness in communities for better disease management.

Patients and parents/guardians of children with asthma need to know the rationale behind daily long-term and quick-relief medications, how to administer medications correctly, and how to adjust the dosage if asthma symptoms occur.

Clayton S. In his study on “Pediatric asthma: overcoming barriers to an improved quality of life.” Realized that, patients with pediatric asthma were not currently achieving symptom control due to such barriers as; under use of effective therapies, inappropriate choice of drug delivery devices and a lack of patient or parent/guardian education regarding the disease and its treatment <sup>[27]</sup>.

By addressing and overcoming these barriers to asthma control, the quality of life of patients and their asthmatic children may be significantly improved.

A study by Hazir T, Das C et al on the level of disease awareness among the carers of asthmatic children was used to determine whether the gathered information would help draw inferences about the possible impact of prevailing perceptions on the management of asthma in a Pakistani community. A questionnaire which included items on general understanding of asthma, its triggers, and management was administered to children's parents/guardians visiting the asthma clinic, Children's Hospital, Islamabad. From the results it was noticed that asthma awareness was inadequate. The majority of the carers unnecessarily blamed and withheld many nutritious foods. Social stigmata can undermine the self esteem of growing asthmatics. Lack of awareness is not significantly related to the socioeconomic or educational background <sup>[28]</sup>. Thus

guardians' asthma awareness raising strategies were found to be of paramount importance in the management of asthma in children.

Asthma control in children is dependent on the level of knowledge of asthma management by their guardians, therefore it is important to encourage constant guardian education during routine asthma clinics.

### **3.0 DESIGN AND METHODOLOGY**

#### **3.1 Goal of Study**

To contribute to the promotion of asthma awareness among guardians of asthmatic children and improve asthma management by ascertaining the current state of awareness among guardians of KNH patients.

#### **3.2 Objectives**

##### **3.2.1 General**

To determine the level of knowledge and comprehension of asthma therapy by guardians of asthmatic children.

##### **3.2.2 Specific**

- To determine the level of knowledge of the basic asthma symptoms
- To assess the level of awareness of the major asthma trigger factors and the lifestyle adjustment measures.
- To establish the level of understanding of the standard prescribed asthma drugs and the proper way of administration.

#### **3.3 Research Questions**

- How much knowledge of asthma symptoms did the guardians have?
- How much knowledge of asthma trigger factors did the guardians have?
- Did the guardians know the number and names of the drugs they were using, the purpose for each drug, and proper use of MDI devices?

### **3.4. Study Area and Population**

Kenyatta National Hospital (KNH), Paediatric chest clinic. Routine medical check-up for asthmatic children is undertaken during the chest clinic days, where children from Nairobi and its environs and sometimes referrals from other hospitals are seen.

### **3.5. Study Design**

This was a hospital-based prospective cross-sectional study.

The data were collected using an interview questionnaire which was designed, piloted and validated for the purpose. Recording of data was done in the presence of researcher or her assistant.

### **3.6. Study Population**

It involved guardians of children aged below twelve years with a diagnosed asthma.

#### **3.6.1. Inclusion Criteria**

Guardians of children who had managed asthma in a given child for a minimum of three months and who consented to participate in the study.

#### **3.6.2. Exclusion Criteria**

Guardians of children who had managed asthma in a given child for less than three months or who did not consent to participate in the study.

### **3.7. Ethical Considerations**

- Permission to carry out the study was sought from the Ethics and Research Committee at Kenyatta National Hospital.
- Administration of the questionnaire/interview was done within the KNH paediatric chest clinic.
- Initials were used to denote the participants' names.
- All information obtained was confidential and only used for intended purposes. Data were kept under lock and in pass-worded computer files to restrict access.
- There were no risks to the patients during the study. Matters of concern in patient management were communicated in line with standard professional practice.
- Once the results were analyzed, the findings were communicated to the primary care givers (nurses at the paediatric chest clinic) to contribute in improving the quality of care of asthmatic children.
- The participants were requested to voluntarily participate in the study after being explained the purpose and allowed to give informed consent for participation.

### **3.8. Sampling Procedure and sample Size**

The questionnaire was administered to all guardians who consented to participate and met the inclusion criteria, during the paediatric chest clinic day of the study period March to July 2009.

During this time 140 guardians consented to participate in the study. However, three guardians were not willing to participate because they felt uneasy but did not give any concrete reason.

### **3.9. Data Collection Method**

Every guardian of an asthmatic child seen on the paediatric chest clinic day who consented to participate, was administered an interview questionnaire after explaining the purpose and getting their voluntary consent (Appendix 2), within the KNH clinic number 23. Relevant data were asked and entered into a closed response interview questionnaire (Appendix 1) Both English and Kiswahili languages were used during data collection process. Administration of the questionnaire was conducted in person by the researcher or a trained assistant selected according to the stated procedure (Appendix 3).

### **3.10. Data Analysis Procedure**

The data collected were then transferred from the questionnaire into the SPSS version 13.0 database for analysis.

Results were presented in form of frequency tables and graphs to demonstrate the level of knowledge of asthma therapy by guardians of children with asthma.

### **3.11. Data quality control**

The data collection questionnaire was pre-designed piloted and validated to facilitate efficient data collection. The data entered were routinely checked for accuracy. Errors and omissions were rectified. After completion of data entry, data clean up was done to correct any mistakes that might have occurred during data entry.

## 4.0. RESULTS

### 4.1. Demographic profile

A total of 140 guardians were studied of which 18 (12.8%) were fathers, 108 (76.6%) were mothers and 14 (9.9%) were the other types of guardians who included aunts, uncles etc.

The majority of guardians 108(77.1%) had managed asthma for more than one year.

Twenty six (18.5%) guardians had primary school education, while the majority had secondary school education and above.

The results are shown in table 1.

**Table1. Demographic factors**

| Characteristic                | N=140 | %    |
|-------------------------------|-------|------|
| Type of guardian              |       |      |
| – father                      | 18    | 12.8 |
| – mother                      | 108   | 76.6 |
| – others                      | 14    | 9.9  |
| Period managed child's asthma |       |      |
|                               | 17    | 12.1 |
| – 3-6 months                  | 15    | 10.7 |
| – 7-12 months                 | 108   | 77.1 |
| – > 1years                    |       |      |
| Education level               |       |      |
| – primary                     | 26    | 18.6 |
| – secondary                   | 67    | 47.9 |
| – college                     | 43    | 30.7 |
| – university                  | 4     | 2.9  |



## 4.2. Asthma symptoms

### 4.2.1. Assessing respondents level of knowledge of asthma symptoms

Respondents were asked eight questions on asthma symptoms and a likert type of multiple choice responses was provided as follows:

*SA= Strongly Agrees, A=Agrees, U=undecided, D=Disagree and SD= Strongly Disagree*

A score was awarded depending on the respondent's choice of response using a likert scale of 1-5 and extrapolated to percentages.

**Table2. Responses on asthma symptoms**

| Symptoms                | Responses (%) |               |               |               |              |
|-------------------------|---------------|---------------|---------------|---------------|--------------|
|                         | SA            | A             | U             | D             | SD           |
| Difficulty in breathing | 22<br>(15.6)  | 115<br>(82.3) | 2<br>(1.4)    | 1<br>(0.7)    | 0<br>(0.0)   |
| Recurrent cough         | 10<br>(7.1)   | 120<br>(85.8) | 6<br>(4.3)    | 4<br>(2.8)    | 0<br>(0.0)   |
| Headache                | 1<br>(0.7)    | 10<br>(7.9)   | 22<br>(15.7)  | 100<br>(70.7) | 7<br>(5.0)   |
| Wheeze                  | 51<br>(36.9)  | 85<br>(60.3)  | 4<br>(2.8)    | 0<br>(0.0)    | 0<br>(0.0)   |
| Diarrhoea and vomiting  | 5<br>(3.5)    | 7<br>(5.0)    | 108<br>(76.6) | 21<br>(14.9)  | 20<br>(14.9) |
| Interrupted sleep       | 8<br>(5.7)    | 118<br>(83.7) | 8<br>(5.7)    | 6<br>(5.0)    | 0<br>(0.0)   |
| School absenteeism      | 3<br>(2.2)    | 103<br>(72.7) | 18<br>(12.9)  | 13<br>(10.1)  | 3<br>(2.2)   |
| Hunger                  | 1<br>(0.7)    | 4<br>(3.5)    | 12<br>(8.5)   | 114<br>(80.1) | 9<br>(6.4)   |

The above scores were graded using the quantiles employed in education system as: 0-25%; 26-50%; 51-75%; 76-100%

The first quantile was disregarded since the least response was awarded a score.

Therefore:

- Below 50% was denoted as **POOR**
- Between 50% and 75% was denoted as **AVERAGE**
- Above 75% was denoted as **GOOD**

The majority of respondents 88(62.8%) scored AVERAGE on knowledge of asthma symptoms while 49(35%) scored GOOD.

Only a small number of respondents 3 (2.1%) scored POOR.

The results were as shown in table 3 below.

**Table3. Mean score of asthma symptoms**

|                                     | score   | No. of people | %    |
|-------------------------------------|---------|---------------|------|
| <b>Knowledge of asthma symptoms</b> | Poor    | 3             | 2.1  |
|                                     | Average | 88            | 62.9 |
|                                     | Good    | 49            | 35   |

#### 4.2.2. Effects of demographic factors on knowledge of asthma symptoms

To assess whether there was significant difference in mean score across various characteristics of guardians, analysis of variance (ANOVA) was used.

- It was found that there was no significant different in mean score across different types of guardian concerning knowledge of asthma symptoms, P-value=0.154.
- There was found to be a significant difference in mean score on knowledge of asthma symptoms among those guardian who had managed asthma in children for one year or more when compared to those who had managed asthma for less than one year, P-Value<0.001.
- There was a significant difference between guardian who had secondary and post secondary education on knowledge of asthma symptoms compared to those who had primary education, P- Value<0.001.

The results are shown in table 4.

**Table4. Effects of demographic factors on knowledge of asthma symptoms**

| Characteristic               | N   | Mean  | 95% CI         | P-value |
|------------------------------|-----|-------|----------------|---------|
| Type of guardian             |     |       |                |         |
| – Father                     | 18  | 76.11 | (73.18, 79.04) | 0.154   |
| – Mother                     | 106 | 74.06 | (73.04, 75.07) |         |
| – Others                     | 13  | 76.15 | (74.14, 78.16) |         |
| Period managed asthma        |     |       |                |         |
| – Less than one year         | 24  | 69.79 | (66.53, 73.06) | <0.001  |
| – One or more than one years | 99  | 75.45 | (74.70, 76.21) |         |
| Education level              |     |       |                |         |
| – Primary                    | 25  | 69.60 | (66.73, 72.47) | <0.001  |
| – Secondary                  | 65  | 74.65 | (73.73, 75.58) |         |
| – Post secondary             | 46  | 77.01 | (75.75, 78.27) |         |

### 4.3. Asthma trigger factors

#### 4.3.1. Assessing respondents level of knowledge of asthma trigger factors

Respondents were asked ten questions on triggers of asthma and multiple choice likert type of responses were provided as follows:

*SA= Strongly Agrees, A=Agrees, U=undecided, D=Disagree and SD= Strongly Disagree*

A score was awarded depending on the respondent's choice of response using a likert scale of 1-5.

**Table5. Scored responses on asthma trigger factors**

| Trigger factors                              | Responses (%) |               |              |              |              |
|--|---------------|---------------|--------------|--------------|--------------|
|  | SA            | A             | U            | D            | SD           |
| Changes in weather e.g. cold weather         | 39<br>(27.7)  | 101<br>(71.6) | 0<br>(0.0)   | 0<br>(0.0)   | 0<br>(0.0)   |
| Smoke  | 13<br>(9.2)   | 116<br>(82.3) | 8<br>(5.7)   | 4<br>(2.8)   | 0<br>(0.0)   |
| Pet dander                                   | 14<br>(9.9)   | 90<br>(63.8)  | 32<br>(22.7) | 4<br>(2.8)   | 1<br>(0.7)   |
| Dusty environment                            | 4<br>(2.8)    | 23<br>(16.3)  | 0<br>(0.0)   | 81<br>(57.4) | 32<br>(22.7) |
| Mould  | 16<br>(11.3)  | 123<br>(87.2) | 1<br>(0.7)   | 0<br>(0.0)   | 0<br>(0.0)   |
| Chest infection                              | 9<br>(6.4)    | 89<br>(63.1)  | 36<br>(25.5) | 6<br>(5.0)   | 0<br>(0.0)   |
| Sporting events                              | 1<br>(0.7)    | 69<br>(48.9)  | 45<br>(31.9) | 23<br>(16.3) | 2<br>(1.4)   |
| Strong emotional expression (scare, cry etc) | 1<br>(0.7)    | 11<br>(7.8)   | 59<br>(41.8) | 61<br>(43.3) | 9<br>(6.4)   |
| Strong odour                                 | 14<br>(9.9)   | 121<br>(85.8) | 2<br>(1.4)   | 3<br>(2.1)   | 0<br>(0.0)   |
| Medicine like aspirin                        | 15<br>(10.6)  | 119<br>(84.4) | 2<br>(2.1)   | 4<br>(2.8)   | 0<br>(0.0)   |

The above scores were graded using the quantiles employed in education system as: 0-25%; 26-50%; 51-75%; 76-100%

The first quantile was disregarded since the least response was awarded a score.

Therefore:

- Below 50% was denoted as **POOR**
- Between 50% and 75% was denoted as **AVERAGE**
- Above 75% was denoted as **GOOD**

The majority of respondents 91 (65%) scored GOOD while 48 (34.3%) of the respondents scored AVERAGE on knowledge of asthma triggers.

Only a small number of respondents 1 (0.7%) scored POOR.

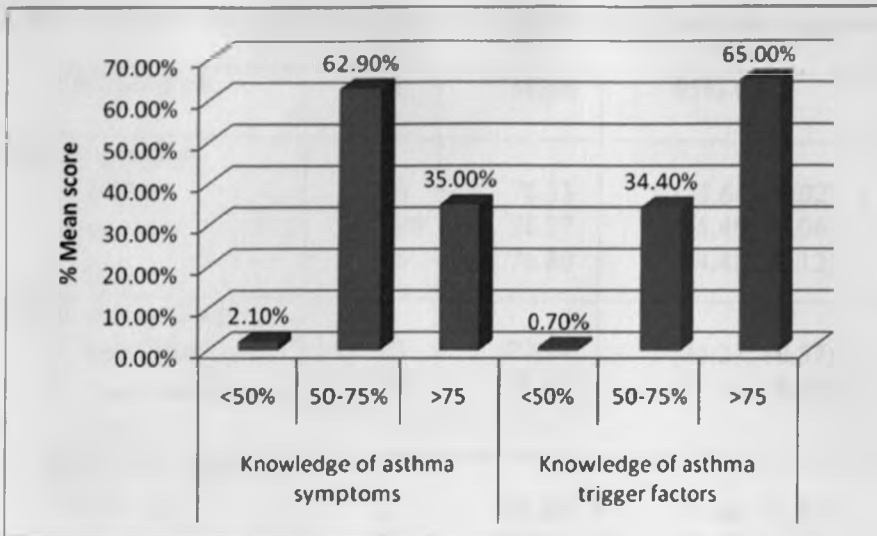
The results were as shown in table 6 below.

**Table6. Mean score of asthma trigger factors**

|  | score   | No. of people | %    |
|--|---------|---------------|------|
| <b>Knowledge of asthma trigger factors</b> | Poor    | 1             | 0.7  |
|  | Average | 48            | 34.3 |
|  | Good    | 91            | 65   |

The above results comparing knowledge of asthma symptoms and asthma trigger factors were as depicted in the diagram below

**Figure 1: Knowledge of asthma symptoms and triggers**



#### **4.3.2. Effect of demographic factors on knowledge of asthma triggers.**

To assess whether there was significant difference in mean score across various characteristics analysis of variance (ANOVA) was used.

- It was found that there was no significant difference in mean score across different types of guardian concerning knowledge of asthma trigger factors. P-value=0.623.
- There was no significant difference in mean score on knowledge of asthma triggers among those guardian who had managed asthma in children for one year or more when compared to those who had managed asthma for less than one year, P-Value 0.714.
- There was a significant difference in mean score on knowledge of asthma triggers among guardian who had secondary and post secondary school education compared to those who had primary education. P-value=0.034.

The results were as shown in table 7 below.

**Table7. Effect of demographic factors on knowledge of asthma triggers.**

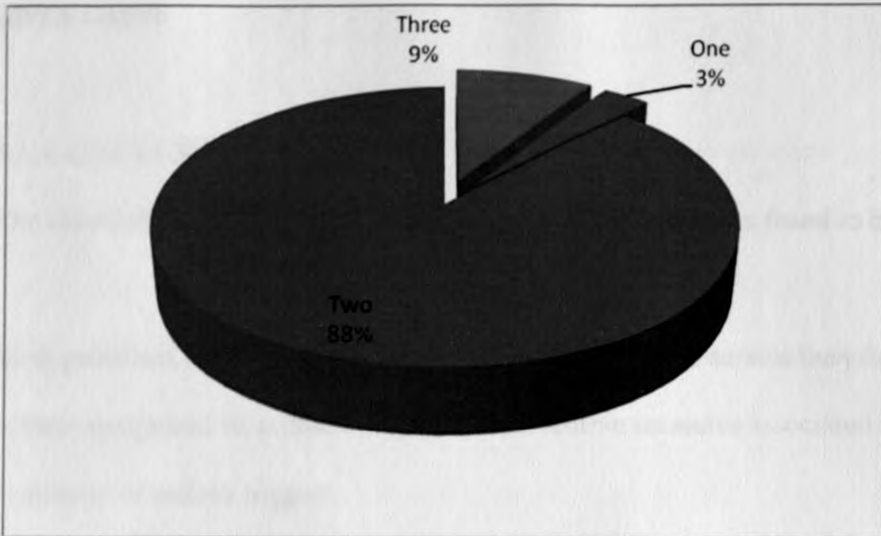
| Characteristic           | N   | Mean  | 95% CI         | P-value |
|--------------------------|-----|-------|----------------|---------|
| Type of guardian         |     |       |                |         |
| – Father                 | 18  | 78.33 | (75.64, 81.02) | 0.623   |
| – Mother                 | 106 | 76.77 | (75.49, 78.06) |         |
| – Others                 | 15  | 76.80 | (74.48, 79.12) |         |
| Period managed asthma    |     |       |                |         |
| – Less than 1 yrs        | 23  | 77.39 | (74.21, 80.57) | 0.714   |
| – One or more than 1 yrs | 101 | 76.87 | (75.72, 78.01) |         |
| Education level          |     |       |                |         |
| – Primary                | 25  | 76.00 | (73.44, 78.56) | 0.034   |
| – Secondary              | 65  | 75.94 | (74.70, 77.18) |         |
| – Post secondary         | 46  | 78.89 | (76.68, 81.11) |         |

#### **4.3.3. Knowledge of Asthma drugs and inhaler usage**

-The majority of children (88%) used two types of inhaled drugs for management of asthma. The drugs included inhaled salbutamol and inhaled short acting steroid. Among the short acting inhaled steroids, budesonide was the most commonly used.

-The remaining 3% used a single symptom relief inhaled salbutamol and 9% had an added third drug which was an oral steroid (prednisolone).

**Figure 2: The number of drugs used**



Concerning the guardians' knowledge of medicine used to manage asthma;

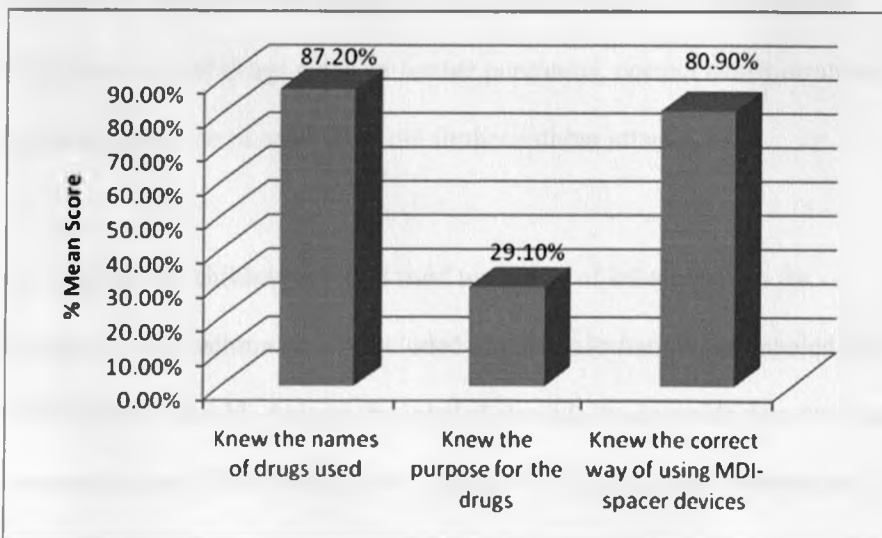
-87.20% had good knowledge of names of the medicine prescribed

-80.90% knew the correct way of using inhaler devices

-Only 29.10% knew the purposes of the prescribed medicine.

The results were as depicted in the diagram below.

**Figure 3: Knowledge of asthma drugs and administration**





## **5. CONCLUSIONS, DISCUSSIONS, RECOMMENDATIONS AND STUDY**

### **LIMITATIONS**

#### **5.1. CONCLUSIONS**

The knowledge of asthma therapy among guardians at KNH was found to be fair.

Most guardians took the knowledge of asthma triggers more serious than that of asthma symptoms; this could be due to the preventive measures associated with avoidance of asthma triggers.

The poor knowledge of asthma symptoms was related to having managed asthma for a short duration of time that is, less than 1 year and low level of education that is, primary school education. The low level of education also affected knowledge of asthma triggers.

A good number of guardians knew the names of medicine prescribed for their children and the correct way of using inhaler-spacer devices. However, the purpose for the prescribed medicine was little known by most guardians.

The knowledge of drugs aided in further purchases, correct administration and proper compliance in order to avoid further asthma attacks.

The majority of children at KNH used two types of inhaled drugs for management of asthma which included inhaled salbutamol and inhaled anti-inflammatory steroid. Among the inhaled steroids, budesonide was the most commonly used. This reflected the staging of asthma as mild intermittent to moderate intermittent asthma according to the WHO staging.

## 5.2. DISCUSSIONS

### 5.2.1. Asthma symptoms:

Asthma symptoms come about as a result of a chronic inflammation of the airways that leads to an associated increase in airway hyper-responsiveness<sup>[6]</sup>.

These symptoms are an indicator that asthma has set in and proper drug management is required to relieve the symptoms and bring the patient back to his or her normal state. The knowledge of asthma symptoms is one of the cornerstone requirements in asthma management. Asthma symptoms alert the patient when the symptom reliever medication should be administered, this helps to relieve unnecessary distress in the patient.

There are a few main asthma symptoms that all carers of asthmatic children should particularly be trained in; Difficulty in breathing with chest tightness is one of the key symptoms to be monitored. There may be audible wheeze or at times heard on examination. Recurrent cough should also be watched out for in asthmatic children<sup>[7]</sup>. A child with uncontrolled asthma may experience frequent awakening at night due to asthma symptoms or even missing normal activities like schooling or sporting events. A child who experiences exercise-induced wheeze and is not able to complete a sporting event may require administration of an inhaled beta2 adrenergic agonist 30 minutes prior to the sport<sup>[3]</sup> in order to prevent these symptoms.

A cross-sectional study by Rashidul Hassan M, Arm Luthful Kabir et al<sup>[31]</sup> on 5642 Bangladeshi people showed an estimated seven million people including

four million children suffered from asthma-related symptoms such as wheeze, chest tightness, cough and other asthma related symptoms.

Management of asthma involves a stepwise approach. Depending on the frequency and severity of symptoms, asthma may be staged as; intermittent asthma, mild persistent, moderate persistent or severe persistent asthma<sup>[1]</sup> before an appropriate management plan is selected to reach adequate control. Therefore, knowledge of asthma symptoms aids both the physician and the guardian on the best way to manage asthma in a child.

In this study, it was found that with proper education on asthma symptoms, any member of the child's family would effectively detect when asthma symptoms set in. Therefore, knowledge of asthma symptoms did not depend on the type of carer for the asthmatic child. This was an excellent finding in that, one guardian would not feel overburdened; instead he or she would easily be assisted by another family member in managing a child's asthma.

Asthma, just like any other disease management, requires experience. In this study it was found that with good training on asthma symptoms, a person who managed asthma in a child for a long period was in a better position of detecting asthma symptoms compared to the one whose child was newly diagnosed or who had managed asthma for a short duration of time. This finding therefore called for intensification of education on asthma symptoms during the patient's initial visits to the asthma clinic.

Literacy was found to be an important factor in asthma management with more educated guardians having a better comprehension on asthma symptoms-education compared to less educated guardians. Continuous training and assessment was therefore to be conducted on less educated and illiterate carers during their visits to the clinic until the required knowledge was imparted on them.

### **5.2.2. Asthma triggers:**

One of the principal therapies of asthma includes knowledge of and avoidance of allergens and other precipitants <sup>[5]</sup>. Therefore knowledge of asthma trigger factors is of paramount importance since this is a preventive measure of asthma symptoms in all ages of asthmatic patients.

Guardians of asthmatic children should be trained on all forms of asthma triggers and measures to be taken in avoiding these triggers. In this study most carers took the knowledge of asthma triggers seriously as it had a direct impact on their lives. By preventing asthma triggers from their children, they would comfortably go about their day today activities without interruption of attending to their children.

There are various asthma trigger factors that ought to be educated to all guardians during their first visit to the asthma clinic. They should then be re-emphasised in the follow-up visits. These include changes in weather patterns and especially cold weather. Children should therefore be dressed in warm clothes during cold weather. Since smoke is one of the triggers of asthma,

anyone who lives with the child and smokes cigarettes should smoke far away from the child to avoid exposing the child to the smoke produced. Cooking using smoke producing stoves should also be done away from reach of the child or use of fuel that produces less smoke should be considered instead. Pets should be avoided in the households of asthmatic children or the children should be prevented from getting into contact with the pets or farm animals, this is because the pet dander produced from pets triggers asthma symptoms. The biggest trigger of asthma is dust and the guardians should ensure total cleanliness of the child's room, fabrics and environment. The child's room should be dusted and washed frequently, not less than once a week. The child should avoid dusty environment and the cleaning process should not be done in the presence of the child.

A study by Meredith, McCormack, et al <sup>[30]</sup> at Johns Hopkins University found an association between increasing levels of indoor particulate matter pollution and the severity of asthma symptoms among children.

An asthmatic child should be protected from strong odours like perfumes, the user of perfumes or sprays should do so far from the child or should avoid the perfumes that can irritate the child's airways.

Strong emotional expressions like scaring, laughing or crying hard can quickly trigger the child's asthma. Games that tend to scare a child like use of ghost masks should also be avoided in these children. All medication the child is given should be checked in order to avoid certain asthma trigger medicines like aspirin or non-steroidal anti-inflammatory drugs. Every time the child's drugs are

prescribed or purchased, the physician or pharmacist should be informed that the child is asthmatic.

Upper respiratory tract infections are also the most frequent causes of wheezing in young children<sup>171</sup> hence prompt treatment of these infections would help prevent asthma symptoms.

In this study, the researcher found out that anyone managing asthma in a child would easily understand the asthma triggers as long as good education was conducted on them, although convincing reasons for the lifestyle adjustment was required for effective implementation of the same.

The length of time a guardian managed asthma in a child did not affect their knowledge of asthma triggers, the knowledge was good after the initial visits to the clinic. Therefore, in as much as asthma triggers were concerned, a thorough education during the initial visits at the clinic was enough to create awareness of asthma triggers in the guardians. A reminder and explanation of lifestyle adjustments was necessary in subsequent visits for effective implementation of the necessary adjustments.

### **5.2.3. Asthma drugs and inhaler usage:**

Pharmacological therapy of asthma is of great importance even in those who stringently avoid allergens<sup>[1]</sup>. Management is likely to fall into reproducible patterns for those with intermittent asthma, mild persistent, moderate persistent or severe persistent asthma. A stepwise approach is taken to add medication to reach adequate control<sup>[4]</sup>.

First step involves intermittent asthma which uses a single drug, inhaled short acting beta2 adrenergic agonist. Second step involves mild persistent asthma which requires inclusion of a regular inhaled preventer drug (steroid) in low dose to the inhaled short acting beta2 adrenergic agonist; therefore two drugs are used in this step. Third step involves moderate persistent asthma which requires substitution of an inhaled short acting beta2 adrenergic agonist with an inhaled long acting beta2 adrenergic agonist. The dose of inhaled steroid may be increased for adequate control. Fourth step involves severe persistent asthma: where by inhaled steroid dose is increased to the maximum or addition of a daily oral steroid in lowest dose may be necessary<sup>[3]</sup>. Alternatively, it may require introducing other therapies like leukotriene receptor antagonists or SR theophylline.

In this study only a small percentage (3%) of children had intermittent asthma where they used a single short acting inhaled beta2 adrenergic agonist. Mild persistent asthma to moderate persistent asthma were observed in the majority of children (88%), who used two types of inhaled drugs including short acting or long acting beta2 agonists and a regular inhaled steroid for management. A third

oral steroid was added to the inhaled beta2 agonist and high dose inhaled steroid in 9% of the children. The use of oral steroids should be in the lowest dose possible for control of asthma and intermittent in order to reduce the chances of occurrence of adverse effects related to oral steroids.

Knowledge of the names of drugs used to manage asthma was important in aiding further purchases of the same medication, this helped to avoid purchasing of drugs from different manufacturers as variations in ingredients used to manufacture may exist. The drugs bought should therefore be of a consistent manufacturer unless a switch was requested by the doctor.

The purpose for each medication prescribed should be properly explained. The guardians should clearly understand the distinction between the symptom reliever beta2 adrenergic agonist and the preventer medication which is anti-inflammatory inhaled steroid<sup>[3]</sup>. This knowledge was important in improving compliance in drug administration and especially with preventer medication which was easily discontinued once the symptom control was achieved.

In this study, knowledge on the purpose of medicine prescribed was found to be poor while the use of metered dose inhaler and spacer devices was found to be good. An on-going training during the clinics was in progress and most guardians demonstrated well usage of these devices. Further training should focus on how to administer the puffs by shaking the inhaler before each puff and administering one puff at a time.



### 5.3. RECOMMENDATIONS

- KNH being a referral hospital, its approach in management of asthma could be different from the other public hospitals and similar studies should be conducted in these hospitals.
- There is need to intensify education on asthma symptoms and trigger factors to the less educated guardians compared to the more educated ones.
- A pharmacist should be involved in the asthma education at the clinic for proper explanation on purposes of asthma drugs and any other advice involving the drugs like expected adverse reactions.
- Leaflets on asthma education should be prepared and distributed to guardians during their visits to the clinic. These should be used as a reminder to the education offered at the clinic.

#### **5.4. LIMITATIONS OF THE STUDY**

- There were chances of interviewer bias due to presence of interviewer or her assistants during filling of questionnaires hence only self-reported responses were used.
- Errors may have been incurred during translation from English to Kiswahili language during data collection in some guardians however this did not have an impact in subject content.
- The time taken to fill each data collection form was short hence the need to employ assistants during the filling of questionnaires.
- The wide choice of answers may have caused uncertainty to the respondents on the best suited answer for the questions.
- Some of the respondents shied away from the study but had no proper reason.
- There was lack of enough resources and time to conduct a wider study.

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## **APPENDIX 1: INTERVIEW QUESTIONNAIRE**

### **INTERVIEW QUESTIONNAIRE ON KNOWLEDGE AND COMPREHENSION OF ASTHMA THERAPY BY GUARDIANS OF ASTHMATIC CHILDREN**

The purpose of this questionnaire was to find out:-

- 1) The level of knowledge of the basic asthma symptoms,
- 2) The level of awareness of the main asthma trigger factors and lifestyle adjustment measures.
- 3) The level of understanding of the standard prescribed asthma drugs

THE QUESTIONNAIRE IS IN 4 PARTS: "A", "B", "C", "D".

Part "A" sought personal information.

Part "B" sought information about the knowledge of asthma symptoms.

Part "C" sought information about awareness of asthma trigger factors and lifestyle adjustment measures.

Part "D" sought information on understanding of the standard prescribed asthma drugs.



**Guardian's particulars**

|  |   |
|--|---|
| Type of guardian                                 | Father, mother, aunty, uncle<br>.....<br>Others, please specify<br>.....  |
| Circumstances for being a guardian               | Separation, divorce, death of parents<br>.....<br>Others, please specify<br>.....                                     |
| The period he/she has managed the child's asthma | Less than 3 months, 3-6 months, 6-12 months,<br>More than 1 year<br>.....<br>.....<br>Others, please specify<br>..... |
| Level of education                               | Primary, secondary, college, university<br>.....<br>Others, please specify<br>.....                                   |

**Please proceed to part B**



## **PART "B"**

Please provide your opinion on the following statement whether you strongly agree, Undecided, disagree or strongly disagree with each statement.

### **1. Difficulty in breathing is a key symptom of uncontrolled asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

### **2. Recurrent cough is possibly a hidden sign of asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

### **3. Your child developing a headache could be a possible symptom of asthma**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

### **4. Audible or examinable wheeze with chest tightness is a positive sign of asthma attack.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

### **5. Some of the symptoms of asthma you should observe in your child are diarrhoea and vomiting.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

### **6. Your child could have interrupted sleep at night due to asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**7. Your child missing school or sporting events could be as a result of uncontrolled asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**8. Your child complaining of hunger could be a sign of asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**Please proceed to part C**

## **PART “C”**

Please provide your opinion on the following statement whether you strongly agree, agree, undecided, disagree or strongly disagree with each statement.

**1. Children should be dressed warmly in cold weather to prevent trigger of asthma symptoms.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**2. Exposing your child to any form of smoke could exacerbate their asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**3. Keeping contact with animals such as cats, dogs, horses, rabbits etc may not be good for asthmatic children.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**4. Your child's room should be dusted and cleaned while the child is inside sleeping.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**5. It is advisable to wash all fabrics available in the child's room at least once a week in order to reduce dust accumulation.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**6. An asthmatic child who develops chest infection should promptly be taken for medical treatment.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**7. We should be careful for a child that participates in sports since this may induce asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**8. It is good to scare an asthmatic child while wearing a ghost mask.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**9. It is necessary to keep your child away from strong odours or fumes such as perfumes, cleaning agents, hair spray etc as this may trigger their asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**10. It is necessary to inform any doctor treating your child that he/she is asthmatic so that the medicines prescribed do not induce their asthma.**

Strongly agree [  ] Agree [  ] Undecided [  ] Disagree [  ] strongly disagree [  ]

**Please proceed to part D**

**PART “D”**

The interviewer will read these questions to you, please select one option you consider is right from the three options provided below.

A. How many different types of medicines are you currently using to control asthma in your child?

(Here the guardian is requested to show the drugs they have carried to the clinic)

One [ ]      two [ ]      three [ ]      others, please specify

.....

B. Do you know the names of these medicines you are using to manage the child's asthma?

Yes [ ]      No [ ]      Not sure [ ]

If yes/no/not sure, the guardian is showed their drugs one by one and told how each drug is referred to.

1. Inhaled salbutamol .....

2. Inhaled steroid .....

3. Others, to be specified; .....

C. Do you know the purpose for each of the medicines you have indicated above?

Yes [ ]      No [ ]      Not sure [ ]

If yes/no/not sure, the guardian is showed their drugs one by one and told the purpose for each

Symptom relief .....

Prevention .....

Control of asthma attack .....

Others, to be specified; .....

D. Do you know the correct way to administer inhaled drugs to the child using inhaler and spacer?

Yes [ ] No [ ] Not sure [ ]

If yes, the guardian is asked to demonstrate the procedure and assisted where necessary.

If no/not sure, the guardian is demonstrated to how to use the MDI and spacer.

E. Do you know how to administer the prescribed strength of the drugs and how frequently you should administer the drugs?

Yes [ ] No [ ] Not sure [ ]

Here the researcher demonstrates on how to administer a given strength of drug using the number of puffs inhaled and explains the frequency of administering each drug.

**END OF QUESTIONNAIRE**

**THANK YOU**

**APPENDIX 2:**

**A. PATIENT INFORMATION PRIOR TO SIGNING OF INFORMED CONSENT FORM**

I.....will be conducting a study to assess guardians' knowledge and understanding of asthma and its management in children. The purpose of this study is to determine knowledge gaps in asthma and its management among guardians of asthmatic children so that in return we can provide further education about the disease and how to get the best results with proper management.

I am therefore requesting you to participate by answering a few questions regarding asthma and how you manage the disease in your child. However if you wish not to participate you are free to do so. This will not in any way affect the treatment you receive from KNH.

If you agree to voluntarily participate in the study please sign the attached consent form.

**B. INFORMED CONSENT FORM**

I .....the guardian of  
..... Have been clearly and fully explained the purpose of this study and all my concerns and questions clearly answered to my satisfactory level, hence I now give my voluntary consent to participate.

**Name:** .....

**Date:** .....

**Signature.** .....

### **APPENDIX 3: PROCEDURE FOR SELECTION OF ASSISTANTS**

The researcher's assistants underwent one day training on the purpose of study, data collection techniques and use of data collection instrument. Afterwards there was a post test to determine the mastery of data collection techniques and use of the data collection tool. The assistant was deemed to have mastered data collection technique and use of instrument when they scored 100% in the post test, after training.



**APPENDIX 4: BUDGET**

| <b>ITEM</b>                 | <b>DESCRIPTION</b>   | <b>UNITS</b> | <b>@<br/>(KSHS)</b> | <b>COST<br/>(KSHS)</b> |
|-----------------------------|--|--------------|---------------------|------------------------|
| <b>Proposal Development</b> | Printing, photocopying and binding of several drafts.          | 10           | 700                 | 7,000                  |
| <b>Personal emolument</b>   | Training, travelling costs and Food allowances for assistants. | 3            | 7,000               | 14,000                 |
| <b>Data entry Clerk</b>     | 10 days of typing  | 10 days      | 500                 | 5,000                  |
| <b>Contingency (15%)</b>    |  |              |                     | 10,000                 |
| <b>TOTAL</b>                |  |              |                     | 26,000                 |

**APPENDIX 5: WORK PLAN**

| <b>ACTIVITIES</b>                                  |         |         |         |             |         |          |
|--|---------|---------|---------|-------------|---------|----------|
| Planning   |         |         |         |             |         |          |
| Proposal writing                                   |         |         |         |             |         |          |
| Submit Proposal to KNH Ethics & Research Committee |         |         |         |             |         |          |
| Data Collection                                    |         |         |         |             |         |          |
| Data Analysis                                      |         |         |         |             |         |          |
| Defence of Dissertation                            |         |         |         |             |         |          |
|  | Nov '08 | Dec '08 | Jan '09 | Feb-Apr '09 | May '09 | June '09 |

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Ref: KNH/UON-ERC/ A/188

7<sup>th</sup> April 2009

Dr. Siminyu Emily Anyango  
Dept. of Pharmaceutics & Pharmacy Practice  
School of Pharmacy  
University of Nairobi

Dear Dr. Siminyu

**Research proposal: "Determination of Knowledge and Comprehension of asthma therapy among guardians of asthmatic children" (P32/2/2009)**

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and **approved** your above revised research proposal for the period 7<sup>th</sup> April 2009 - 6<sup>th</sup> April 2010.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimen must also be obtained from KNH-ERC for each batch.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

**PROF. A N GUANTAI**  
**SECRETARY, KNH/UON-ERC**

c.c. The Chairperson, KNH/UON-ERC

The Deputy Director CS, KNH

The Dean, School of Pharmacy, UON

The Chairman, Dept. of Pharmaceutics & Pharmacy Practice, UON

Supervisor: Dr. James Ombega, Dept. of Pharmaceutics and Pharmacy Practice, UON