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Department of Family and Emergency Medicine  
Faculty of Medicine and Health Sciences  
Stellenbosch University**

**Project Title**

The knowledge, attitudes and practices of caregivers of children with asthma attending the Raleigh Fitkin Memorial Hospital, Manzini, Swaziland.

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## **DECLARATION**

I, the undersigned, hereby declare that the work contained in this assignment is my original work and that I have not previously submitted it, in its entirety or in part, at any university for a degree. I also declare that ethics approval for the study was obtained from the Health Research Ethics Committee of Stellenbosch University (Reference number: S16/01/007).

Signature: .....

Date: .....

## **Abstract**

### **Background**

Globally, 14% of children are affected by asthma. The literature emphasizes patient education the use of inhalers to relieve and control asthma attacks. The objective of the research is to assess the knowledge, attitudes and practices of caregivers of children with asthma who have been treated at Raleigh Fitkin Memorial Hospital (RFMH).

### **Aim**

This study aims to assess the knowledge, attitudes and practices of caregivers of children with asthma who attend the RFMH in Manzini, Swaziland.

### **Methods**

A cross sectional descriptive survey was used with simple random sampling to recruit 91 eligible caregivers of children between 2 and 12 years of age with asthma who were seen between December 2015 and December 2017. Selected caregivers were contacted by phone obtained from the hospital's asthma patient registry. Then, face to face interviews were conducted using a validated semi-structured questionnaire at RFMH, which is the second largest referral hospital in Swaziland serving an estimated 350,000 people. Data was analyzed using SPSS v21.

### **Results**

A total of 85.7% of respondent knew and used salbutamol syup as a reliever 9.9% used salbutamol syrup as asthma preventer and none of them knew about and used steroid inhalers. Only 4.4% were confident to use metered dose inhalers. About 80% of participant believe that oral medication is better than metered dose inhalers. About 80% believed that metered dose inhalers are addictive. All of caregivers reported that they do not have regular follow-up appointment visits with their health care providers.

### **Conclusion**

This research study shows that knowledge related to childhood asthma and its management of caregivers of children with asthma in Swaziland show room for improvement. Most caregivers had a negative attitude regarding MDI use, which prevents them from using reliever and controller MDIs appropriately. Some of the barriers to the effective management of asthma are caregiver misconceptions about inhalers, poor level of service given by health professional which included absence of regular follow up appointments and lack of evidence-based national asthma guidelines. The KAP of caregivers of children with asthma attending

the RFMH in Swaziland demonstrate that asthma related education and management programs show room for improvement. Special attention should be given to educate caregivers regarding their children who are suffering from chronic diseases such as asthma at RFMH, as well as in the country at large.

## 1.0 Introduction

Asthma is “a heterogeneous disease, usually characterized by chronic airway inflammation. It is identified by the presence of symptoms such as wheezing, shortness of breath, chest tightness and cough that vary over time and in intensity together with variable expiratory airflow limitation.”<sup>1</sup>

Asthma is a common chronic illness among children worldwide. Globally, 14% of the world’s children are affected by asthma,<sup>2</sup> with those living in low and lower-middle countries being disproportionately affected.<sup>3-5</sup> The prevalence of asthma among children in Africa increased from 34.1 million in 1990 to 49.7 million in 2001.<sup>6</sup> Focusing on sub-Saharan Africa, research in South Africa has shown that the prevalence of paediatric asthma is on the rise, especially in urban areas, and this disease has become one of the most common reasons for hospital admissions.<sup>7-9</sup> The increased mortality and morbidity rates in sub-Saharan countries are often linked to the association between poverty and asthma.<sup>4,5</sup> In addition, research has shown that there is a higher rate of hospitalizations, longer hospital stays, more frequent emergency department visits, and poor ambulatory follow-up among the poor compared to more affluent children.<sup>1,5</sup>

There are several consequences of asthma noted in developing countries, one of which is an increased workload in health institutions and poor asthma self-management skills.<sup>7,9-14</sup> This is a critical healthcare delivery issue as many hospitals and clinics are already over-utilizing health services and experiencing a severe shortage of trained health professionals, diagnostic equipment, and medication.<sup>15,16</sup> Furthermore, higher rates of school and work absenteeism among families who have children with uncontrolled asthma remain an important concern globally.<sup>10-12</sup> This may be associated with an increase in an already significant financial burden on families due to loss of income and additional expenditure related to asthma management.<sup>2,11,12,16</sup> Achieving optimal asthma management outcomes is difficult in the sub-Saharan African region despite the presence of guidelines, research evidence and well-trained health professionals.<sup>13,16,17</sup>

Although literature emphasizes the use of inhaled corticosteroids and that improved symptom control and management can be achieved by using metered dose inhalers (MDIs)<sup>1,2,9</sup> the use of oral bronchodilators

among children is still the standard treatment in some areas.<sup>2,15,16,18</sup> Studies indicate that major barriers to effective paediatric asthma control include the lack of al asthma knowledge, negative attitudes, and poor practices related to asthma and its management.<sup>11-13,19-22</sup> Therefore, lack of knowledge about symptoms of asthma, along with lack of population based case finding programs, leave a significant number of children with undiagnosed asthma living with a reduced quality of life.<sup>23</sup>

Another challenge related to the management of asthma is the fear of possible side-effects of asthma-medications, which may further increase the likelihood of poor adherence and asthma control<sup>16,24-26</sup> and the reality of available traditional treatments in Southern Africa which may lead are givers to use medical treatment as the last option.<sup>13,16,24</sup> Addressing this issue, research has found that accurate patient knowledge, attitudes, and practices (KAP) regarding asthma is important for achieving optimal asthma management outcomes.<sup>24-26</sup> This has been supported by health education-based interventions in different countries that resulted in a reduction of emergency visits and hospitalization rates and an increase in proper usage of asthma medication as well as making environmental changes which help children with asthma avoid triggers responsible for asthma exacerbation.<sup>19-22</sup>

In Swaziland, the smallest land locked country in southern Africa with a population of about one million, of which 44% are under 15 years of age<sup>28</sup> the number of asthma cases reached the 500 mark in 2013,<sup>25</sup> with cases higher among females than males. The local Ministry of Health (MOH) recommended that treatment and prevention of asthma be scaled-up, triggers for asthma identified and increased family-centered prevention strategies enacted, together with innovative methods for prevention and treatment and capacity building conducted for their effectiveness.<sup>25</sup> There are inadequate published studies on the KAP of asthma management in children in Swaziland. This is of concern due to the fact that poor paediatric asthma management remains a prominent issue within other countries in the sub-Saharan region.

## **2. Aim**

This study aims to assess the knowledge, attitudes and practices of caregivers of children with asthma who attend the Raleigh Fitkin Memorial Hospital in Manzini, Swaziland.

## **3. Objectives**

1. To describe the knowledge of caregivers about asthma, triggers of asthma and the treatment of children with asthma who attend the RFMH.

2. To explore the attitudes of caregivers of children with asthma towards metered dose inhalers, who have been treated at RFMH.
3. To describe the practices of caregivers of children with asthma regarding the avoidance of triggers and engagement with asthma management of their children treated at RFMH.

## **4.0 Research Methods**

### **4.1 Study design**

The researcher conducted a quantitative, cross-sectional descriptive survey of caregivers of children between 2 and 12 years of age with asthma who were attending the paediatric asthma outpatient clinic, emergency department or had been admitted to the paediatric ward of RFMH between December 2015 and December 2017.

### **4.2 Study setting**

The Manzini region is one of the largest regions in Swaziland with approximately 350,000 people. Families are mainly of lower socioeconomic class, are served by public community clinics and unemployment is highly prevalent. The RFMH has a capacity of 350 beds and is the second largest regional referral hospital in Swaziland serving an estimated 350,000 people with 20 community clinics operating in four regions of Swaziland. The hospital delivers service to children from birth to 12 years of age in the children's outpatient clinic, the emergency department, and a 50 bed paediatric ward.

### **4.3 Study population**

#### **4.3.1 Inclusion and Exclusion criteria**

Respondents were asked if they were willing to participate in a screening-interview. Caregivers were defined as biological kin or those that have legal guardianship of the child.

The screening-interview consisted of 6 questions to identify if respondents fulfil the following inclusion criteria: attending RFMH, having a child that has been diagnosed with asthma by a clinician based on symptoms and response to bronchodilators as outlined in the Global Initiative for Asthma (GINA) management guideline, being a caregiver of an asthmatic child aged 2-12 years, provided written informed consent, had a child that has had at least two episodes of asthma attacks, managed in the clinic or hospital with good response<sup>1</sup> and had a functioning contact telephone number.

The exclusion criteria were: children below the age of 2 years and above 12 years of age, no written informed consent provided, children diagnosed by those other than a clinician and those with an unverified diagnosis of asthma, not having a functional contact telephone number for contact purposes and those who had undergone an asthma education program which is currently conducted in RFMH. In situations where there was no telephonic response, additional participants were randomly selected from the asthma registry.

### **4.3.2 Sampling method and procedure**

After making use of the local asthma registry, the selection of caregivers to participate in the survey questionnaire was conducted using simple random sampling to recruit 91 eligible caregivers of children (aged 2 to 12 years of age) with asthma. A list of card numbers of children who were seen in the emergency room, outpatient department and children's ward between October 2015 and October 2017 were obtained from the hospital's asthma patient registry. The telephone number of the caregivers were obtained from the card room by the researcher. Those selected caregivers were contacted using their phone number obtained from the children's file traced through the hospital's patient's registry of RFMH.

### **4.3.3 Sample size**

The sample size was calculated using open source software for epidemiologic statistics using a 95% confidence interval, with an estimated response rate of 50%. Since the objectives of this study are purely descriptive, sample size estimation was not done using any effect size. Sample size was estimated for precision of a 95% confidence interval of 7% width around a proportion of 50%. A sample size of 95 was required based on a finite population of N=180.

## **4.4 Data collection**

### **4.4.1 Study instrument**

A semi-structured KAP questionnaire which comprised of five sections was designed using the software Epi info version seven. The five sections included: socio demographic information of the caregivers, general information regarding the children with asthma, questions on caregivers' knowledge, attitude and practices regarding asthma.

The KAP questionnaire was designed by using similar KAP studies which were done in other countries as the basis for creating the questionnaire<sup>27</sup> and was adapted to the Swaziland context. The instrument was validated by a selected group of specialist family physicians in the division of Family Medicine and Primary Care, Department of Family and Emergency Medicine, Faculty of Medicine and Health Sciences,

Stellenbosch University and public health specialists to ensure its validity and reliability. The questionnaire language was pitched at a grade 8 education level, consisted of multiple choice, open-ended questions and included the use of a Likert Scale. A pilot study was conducted with caregivers of children with asthma who attended the outpatient paediatric clinic, emergency department and those who were admitted to the children's ward. This served to improve on the questionnaire clarity and the logistics of questionnaire administration. The piloted questionnaires were not included in the data analysis. After pilot testing of the questionnaire, revisions were made and the final version of the KAP questionnaire was formulated.

#### **4.4.2 Data collection method and procedure**

Caregivers who fulfilled the inclusion criteria were asked to sign a written informed consent form, which was prepared in siSwati and English. The information was read to those not able to read and they were given the opportunity to ask any question which was then answered to their satisfaction before they sign the consent form. The respondents were informed about the questionnaire and how the interview was to be conducted. All questionnaires were administered by the principal researcher, using face-to-face interviews at RFMH. A translator assisted the principal investigator in situations where the caregivers could not speak English. The translator underwent special training prior to the questionnaire completion. Incomplete questionnaires were not scored or analyzed. The interview took about fifteen minutes and it was conducted in the privacy of one of the available consultation rooms in the hospital.

#### **4.4.3 Data management**

Access to participant's information was restricted to the principal investigator only. All electronic data was password-protected and all paper based data was stored in a lockable cabinet in the principal investigator's office and was accessible only to principal investigator.

#### **4.4.4 Data Analysis**

Data analysis was conducted using SPSS version 21<sup>29</sup> by the Division of Epidemiology and Biostatistics, Department of Global Health, Faculty of Medicine and Health Science of Stellenbosch University.

### **5. Ethical considerations**

An application was submitted and administrative approval to conduct the study was sought from the administrative office of RFMH, while ethics approval was obtained from the Health Research Ethics Committee (HREC) of Stellenbosch University and the National Research Review Board (NHRRB) of the Ministry of Health in Swaziland. (Ethics reference number: S16/01/007).

## 6. Results

During the study 91 caregivers were recruited. Of these, 54 (59.3%) were married (Table 1). The mean age of caregivers was 37 years ranging from 22 to 65 and with a standard deviation of 9. The primary caregiver for most of the children in the study was their mother (61; 67%). Considering the area of residency, 38 (41.8%) were from urban and 40 (44%) from rural areas. Most caregivers had a secondary education level 45 (49.5%).

**Table1. General information about the caregivers of children with asthma attending RFMH.**

|                                       |                  | Frequency  | Percentage |
|---------------------------------------|------------------|--|------------|
| Age                                   |                  | Mean 37 years (SD 9 years)<br>range 22 to 65 years |            |
| Gender                                | Male             | 21   | 23.1%      |
|                                       | Female           | 70   | 76.9%      |
| Marital status                        | Married          | 54   | 59.3%      |
|                                       | Unmarried        | 29   | 31.9%      |
|                                       | Divorced         | 2  | 2.2%       |
|                                       | Separated        | 5  | 5.5%       |
|                                       | Widowed          | 1  | 1.1%       |
| Area of residency                     | Urban            | 38   | 41.8%      |
|                                       | Sub-urban        | 13   | 14.3%      |
|                                       | Rural            | 40   | 44%        |
| Caregiver's employment status         | Employed         | 46   | 50.5%      |
|                                       | Unemployed       | 15   | 16.5%      |
|                                       | Self employed    | 22   | 24.2%      |
|                                       | Retired          | 3  | 3.3%       |
|                                       | Student          | 5  | 5.5%       |
| Caregiver's education level           | Illiterate       | 0  | 0%         |
|                                       | Primary school   | 16   | 17.6%      |
|                                       | Secondary school | 45   | 49.5%      |
|                                       | Tertiary school  | 30   | 33%        |
| Caregiver's relationship to the child |                  |  |            |
|                                       | Mother           | 61   | 67%        |
|                                       | Father           | 18   | 19.8%      |
|                                       | Grand Mother     | 7  | 7.7%       |
|                                       | Brother          | 2  | 2.2%       |
|                                       | Aunt             | 2  | 2.2%       |
|                                       | Step mother      | 1  | 1.1%       |

A total of 59 (64.8%) of children with asthma were male and 32 (35.2%) were female (Table 2). The mean age of children was 7 years, ranging from 2 to 12 and with a standard deviation of 3. A total of 64 (70.3%) had a family history of asthma (Table 2).

**Table 2. General information about the children with asthma attending RFMH.**

| Characteristics          |        | Frequency   | Percentage |
|--------------------------|--------|---|------------|
| Age (years)              |        | Mean 7 years (SD 3 years)<br>range 2 to 12 years) |            |
| Gender of the Child      | Male   | 59  | 64.8       |
|                          | Female | 32  | 35.2%      |
| Family history of asthma | Yes    | 64  | 70.3%      |
|                          | No     | 27  | 29.7%      |

When asked about asthma control, 64 (70.3%) reported nocturnal symptoms of asthma, 50 (54.9%) had limitations of daily activities and 48 (52.7%) used reliever more than two times per week during the past four weeks prior to the interview (Table 3).

**Table 3. Asthma control**

| Symptoms during the last 4 weeks   |                    | Frequency                            | Percentage |
|--|--------------------|--------------------------------------|------------|
| Symptoms of asthma during the day in the past 4 week due to asthma symptoms: | Not at all         | 27                                   | 29.7%      |
|  | < 2 times per week | 40                                   | 44%        |
|  | > 2 times per week | 24                                   | 26.4%      |
| Waking up at night during the past 2 weeks due to symptoms of asthma:        | Yes                | 64                                   | 70.3%      |
|  | No                 | 27                                   | 29.7%      |
| Limitations of daily activities during the past 4 weeks:                     | Yes                | 50                                   | 54.9%      |
|  | No                 | 41                                   | 45.1%      |
| Use of reliever during the past 4 weeks                                      | Not at all         | 22                                   | 24.2%      |
|  | < 2 times per week | 21                                   | 23.1%      |
|  | >2 times per week  | 48                                   | 52.7%      |
| Admission to the hospital in the past 1 year                                 |                    | 73                                   | 80%        |
|  | Zero               |                                      |            |
|  | Once               | 9                                    | 9.9%       |
|  | Twice              | 6                                    | 6.6%       |
|  | Three times        | 2                                    | 2.2%       |
|  | Four times         |                                      |            |
|  | Five times         | 1                                    | 1.1%       |
| >5 times   | 0                  | 0%                                   |            |
| Missing school in a year   |                    | Median 4 days,<br>range 0 to 48 days |            |
| Missing work (/care giver) in a year   |                    | Median 2 days,<br>range 0 to 30 days |            |

### **Caregiver asthma-related knowledge**

The median knowledge score 54.7 with SD of 10.5 and range from 32.5 to 88.24. Regarding the cause of asthma 26 (28.6%) knew that asthma is associated with a positive family history, only 12% (n=11) knew that asthma is an allergic condition. When asked about trigger factors, 90 (98.9%) reported change in weather, 85 (93.4%) cold weather, 78 (85.7%) tobacco use, 79 (86,8%) passive exposure to tobacco smoke, 76 (83.5%) cold water and 77 (84.6%) flu as triggers of asthma attacks. Regarding their knowledge about asthma symptoms, more than 90% stated cough, wheezes, difficulty in breathing and chest tightness as symptoms of asthma. The most frequently used medication was salbutamol syrup (85.7%). In items related to their knowledge about their medications, of those who used salbutamol syrup only 4.4% (4/76) were able to correctly name one common side effect of the medication. The numbers were similar or worse for other medications. When asked about the controller, 9.9% use salbutamol as asthma preventer and none of the caregivers knew or used steroids and 80 (90.1%) did not know what a preventer is. A total of 43 (47.3%) caregivers believed that medication can cure asthma and 67 (73.6%) reported that health care providers never educated them on the proper use of the MDI. With regard to the source of information related to asthma, the majority (75; 82.4) reported that they received information from doctors, (60, 65.9%) from other people with asthma, 38.5% (56%) from nurses, and only 10 (11.0%) reported receiving information from searching the internet.

### **Attitude of caregivers**

The attitude component of the questionnaire contained 12 items (Table 4). The questions mainly focus on the attitude of caregivers towards MDIs. The median attitude score 45 with SD 12 of and ranging from 21.67 to 81.67. When asked if oral medication is better than the inhaler spray 78% agreed that oral medication is better than inhaler. When assessing the confidence to use inhaler spray only, 14.3% (n=13) were confident to use inhaler and 70% (n=64) were not confident to use spray. A total of 42 (46%) were of the opinion that inhaler should not be prescribed to children. About 76% (n=69) agreed that inhaler can be prescribed only for severe cases of asthma and 61 (67%) agreed that inhaler is addictive.

**Table 4. Attitude of caregivers regarding asthma MDI treatment**

| Variable   | Strongly agree |        | Agree     |        | Unsure |        | Disagree      |        | Strongly disagree |        |
|--|----------------|--------|-----------|--------|--------|--------|---------------|--------|-------------------|--------|
|  | Freq.          | %      | Freq.     | %      | Freq.  | %      | Freq.         | %      | Freq.             | %      |
| Oral medication is better than inhaler                   | 52             | 57.1 % | 19        | 20.9 % | 12     | 13.2 % | 6             | 6.6 %  | 2                 | 2.2 %  |
| Nebulizer is better than spray                           | 57             | 62.6 % | 20        | 22.0 % | 10     | 11.0 % | 4             | 4.4 %  | 0                 | 0.0 %  |
| Children with asthma should not participate in the sport | 16             | 17.6 % | 12        | 13.2 % | 10     | 11.0 % | 27            | 29.7 % | 26                | 28.6 % |
| Inhaler shouldn't be prescribed for children             | 30             | 33.0 % | 12        | 13.2 % | 24     | 26.4 % | 12            | 13.2 % | 13                | 14.3 % |
| Inhaler can be addictive                                 | 39             | 42.9 % | 22        | 24.2 % | 19     | 20.9 % | 7             | 7.7 %  | 4                 | 4.4 %  |
| Inhaler is expensive                                     | 27             | 29.7 % | 17        | 18.7 % | 24     | 26.4 % | 12            | 13.2 % | 11                | 12.1 % |
| I could forget carrying inhaler and will be in trouble   | 62             | 68.1 % | 13        | 14.3 % | 4      | 4.4 %  | 8             | 8.8 %  | 4                 | 4.4 %  |
| Inhaler should be used for severe cases only             | 51             | 56.0 % | 18        | 19.8 % | 14     | 15.4 % | 4             | 4.4 %  | 4                 | 4.4 %  |
| Inhaler is dangerous                                     | 37             | 40.7 % | 4         | 4.4 %  | 21     | 23.1 % | 17            | 18.7 % | 12                | 13.2 % |
| Inhaler make asthma worse                                | 7              | 7.7 %  | 10        | 11.0 % | 28     | 30.8 % | 21            | 23.1 % | 25                | 27.5 % |
| Medication used for nebulizer is different from inhaler  | 32             | 35.2 % | 19        | 20.9 % | 26     | 28.6 % | 10            | 11.0 % | 4                 | 4.4 %  |
| Variable   | Very confident |        | Confident |        | Unsure |        | Not confident |        | Very unconfident  |        |
|  | Freq.          | %      | Freq.     | %      | Freq.  | %      | Freq.         | %      | Freq.             | %      |
| Confidence about the use of inhaler spray                | 4              | 4.4 %  | 9         | 9.9 %  | 14     | 15.4 % | 8             | 8.8 %  | 56                | 61.5 % |

## Practices of caregivers

The practice component of the questionnaire contained 12 items. When asked about the first thing they would do when the child has an acute asthma attack 39 (43.3%) would give salbutamol syrup, 31 (34.1%) and only 4 (4.4%) use spray. 25 (27.5%) give warm drinks. 22 (24.2%) go straight to the hospital for nebulizer without giving any medication. Regarding the reason for hospital visit related to asthma all (100%) reported because of acute asthma attack and only 2 (2.2%) for drug refill. With regard to monitoring and follow-up, all (100%) reported that they don't have regular appointment with their health care providers. Only 1/91 (1.1%) used a spacer. With regard to prevention, 68 (74.7%) avoided cold by putting on more clothes and 61 (67%) by avoiding cold food.

## 7. Discussion

This is the first research study of the KAP of caregivers of children with asthma conducted in Swaziland. This study provides valuable insight about the knowledge, attitudes and practices adopted by Swazi caregivers in the absence of evidence-based local guidelines. It is disturbing to note that only 12% of participants knew that asthma is an allergic condition; while only 28% knew that asthma is hereditary. About 20/91 (22%) of respondents cited cold weather as the cause of asthma. This indicates that most caregivers don't have enough knowledge about fundamentally important aspects of asthma and cannot differentiate the cause from the triggers. However, most of the respondents had knowledge about most of asthma triggers. A number of respondent cited cold as the main trigger with change in weather 90 (98.9%), cold weather 85 (93.4%) cold water 74 (81.3%) most frequently identified. Regarding all practices toward avoidance and asthma control, 65 (71.4%) avoided cold by putting on more cloths and 56 (61.5%) avoided cold food. It indicates that cold is the commonly perceived triggers by the majority of caregivers and it appears that they do not have knowledge on how to avoid other triggers. It is important that health professionals work with caregivers in order to identify the allergens in the home environment and provide education on how to avoid them. Even though exercise is a very important component in the management of childhood asthma, 28.6% of responding caregivers restrict their children from physical exercise because of the fear that exercise would trigger an asthma attack. This shows that there is a need to further provide education on the value of exercise and the ability of therapy to control exercise induced symptoms in most cases. In addition, tobacco was another commonly perceived allergen (86%). By contrast very few mentioned cockroaches 9 (9.9%). Therefore, it is important to explain to caregivers that asthma is not solely related to hereditary factors or associated with extremes of cold weather, but that awareness of other environmental factors also play a major role in the management of asthma and treatment outcome. Research conducted in China confirmed a direct association between knowledge and asthma prevention and management practices.<sup>6</sup> It is therefore very important to strengthen the education of caregivers to improve

their management practices.

Another area where there was a wide range of responses was that of the asthma child's medication. The majority of caregivers use oral bronchodilator to manage the child's acute asthma attack. The most commonly mentioned medications by the participants were salbutamol syrup 78/91 (85.7%) and alcophyline syrup 65/91 (71.4%) and only 13/91 (14.3%) knew about and used salbutamol inhalers. In support of our findings, research conducted in Lebanon shows that 60% of caregivers preferred oral over inhaler treatment.<sup>27</sup> In similar research conducted in Cape Town, showed that one third used syrups.<sup>28</sup>

With regard to the use of controller, 9/91 (9.9%) knew about and used salbutamol syrup as the preventer on daily basis and none of them knew about or used steroid inhaler. As asthma is a chronic inflammatory disease, this demonstrated lack of knowledge could be one of the reasons for poor control of asthma and their asthma children having nocturnal symptoms in 70% of cases. Similarly, in the research conducted in Lebanon and Cape Town, very few mentioned the use of steroids.<sup>27</sup>

The finding of this study also indicates that caregivers didn't know the difference between the relievers and controllers. In order to enhance the level of perception of the caregivers, education should include knowledge about asthma and its treatment. Even though the participants indicated that they get information mostly from the doctors (84.6%) and nurses (62%), it is disturbing to note that about 70% of the participants had never been educated about proper inhaler technique. The current national guideline in Swaziland supports the use of both oral bronchodilators and MDIs.<sup>26</sup> This indicates the poor level of health education offered by the health care providers coupled with lack of available updated evidence-based guidelines concerning proper asthma management.

The finding of this study on the attitude of caregivers towards inhalers revealed that 78% of participants strongly agree that oral medication is better than MDI use for children. When they asked the reason, they said that syrup is made for children while inhalers are made for adults. In addition 76% of the participants believe that MDIs should be reserved for severe cases of asthma. One of the reasons for this could be that more than half of the participant, (56.1%), believed that the medication used in nebulization to be different to that in the MDI. Not surprising that the majority of caregivers, (77%), prefer to come for nebulizer rather than use the MDI, which is associated with and increased utilization of emergency department resources at RFMH. This shows that caregivers have a negative attitude towards MDI use which could be related to a lack of proper knowledge about their asthma child's medications.

It is important to educate caregivers regarding the proper dosage and side effects profile of available asthma medication. Even though there is no additional fee charged for all medications at RFMH, 45% of the caregivers agreed that MDIs are expensive. A total of 67% of the participants were concerned that they might forget to carry the MDI and therefore might have a problem during acute asthma attacks. In addition, 38.5% of patients were concerned that MDIs can be addictive. They stated that the reason why patients use an inhaler for life is because of addiction rather than chronicity of the disease. This finding is echoed in similar research conducted in Cape Town.<sup>28</sup> It appears that most of the caregiver concerns need simple explanation and education to improve their understanding and help them develop confidence about the use of MDIs in asthma. Research in other countries<sup>6,13,18,28,31</sup> have confirmed that the majority of caregivers had strong concerns about the medication of their children with asthma. It is therefore extremely important that health care workers be aware of and act on the prevalent misconceptions and concerns among caregivers regarding the management of asthma.

Another important finding in this study is that most of the respondents manage acute attacks themselves using oral bronchodilators, and would only take the child to a doctor if the attack did not improve. Research conducted in Cape Town, South Africa, showed similar findings.<sup>28</sup> A total of 33% of caregivers would administer another dose before the next dose of medication is due. Such kind of practice exposes the children to unnecessary side-effects and may lead to longer periods of suffering which might increase morbidity and even contribute to mortality. A total of 22 (24.2%) reported that they would go straight to the hospital without giving any medication, while 39.6% of the respondents give salbutamol syrup and 29.7% give alcophyline syrup.

According to GINA<sup>1</sup> oral short acting bronchodilator is not recommended due to its slow onset of action, high doses required and potential for side-effects due to systemic absorption. The small proportion of caregivers who used MDIs, (4.4%), reported that they initially preferred to give oral syrup, followed by the MDI if the child did not improve with the syrup. This practice suggests that there is no clear instructions or self-management action plan both from doctors or dispensary staff. This finding further shows that caregivers who do not use MDIs are not very confident regarding its use. This could also be due to the fact that the treatment guideline in Swaziland supports the use of either the inhaler or oral medications or both for acute attack and there is no clear clarification when and how.<sup>26</sup> Similar research conducted in Cape Town, SA, showed that the overwhelming majority of the children (90.5%) were on some form of oral medication, particularly syrups because of the fear of inhaler therapy, fear of addiction and high cost.<sup>18</sup>

Most respondents were aware of a number of home remedies, which they used with oral syrup during the

acute asthma attack. Some respondents wait for the child's response to the home remedies before they would seek attention at the hospital. This finding is supported by research conducted in Maputo where a considerable number of caregivers first sought traditional treatment before they considered medical treatment.<sup>9</sup> Some of the home remedies included warm or hot drinks sweet, coffee, onion, garlic, honey, rosemary, Swazi trees, lemon, rubbing stuff on the chest, warm water as well as prayer.

Another very important contributing factor to poor management of asthma is the fact that all caregivers never had any regular follow up appointment visits (100%). All (100%) visit their health care providers when their children experience acute asthma attacks. Such acute attack visits are not conducive to proper asthma education, as doctors would be very busy in the emergency room and patients may not be psychologically prepared for such education. Similar research conducted in China indicated a good the correlation between regular follow-up visits and fewer asthma attacks and emergency department visits.<sup>29</sup> GINA<sup>1</sup> suggests that patients with asthma need to have regular appointments based on the severity and level of control. In additions the guideline recommends that regular physician visits, when asthma is controlled, can provide good opportunities for asthma education to caregivers.<sup>1</sup> Therefore, it is important to establish asthma follow-up clinic appointments where doctors will be able to interact and educate the caregivers of asthma patients.

Regarding al practices toward avoidance and asthma control, 65 (71.4%) avoided cold by putting on more cloths and 56 (61.5%) avoided cold food. It indicates that cold is the commonly perceived triggers by the majority of the caregivers and it appears that they do not have knowledge on how to avoid other triggers. It is important that health professional to work with caregivers in order to identify the allergens in the home environment and teach on how to avoid them. Even though exercise is a very important component in the management of childhood asthma, 28.6% of respondent restrict their children from physical exercise because of the fear of asthma attack. This shows that there is a need to educate the value of exercise and the ability of therapy to control exercise induced symptoms in most cases.

## **8. Limitations**

The sample size here is relatively small, but is representative of our study setting. This study did not look at the number of caregivers of asthmatic children who are in the community and who may be at risk, as their contact is mainly with the PHC services.

## **9. Recommendation**

There is a need to educate caregivers in order to deal with their misconception about inhalers, identify the type of allergen in the home environment, train and supervise the correct use of inhaler technique, right exercise and medication regimen. The education should also include empowering caregivers to assist in bringing asthma under control. This can be achieved through patient centred communication between health professionals and the caregivers. There is a need for advocacy for modern asthma treatment and updated evidence-based guidelines to be used as standard practices at RFMH and in Swaziland at large. It is also important to conduct research to assess the knowledge, attitude and practices of health professionals at RFMH as well as other health institutions along with qualitative research on knowledge, attitude and practice of Swazi caregivers to identify the reasons for their misconceptions related to asthma and its treatment. Health care professionals need to be updated on asthma management through regular training courses. It is also important to establish an asthma follow-up clinic at RFMH where patient will be able to interact with health professionals on a regular basis. The current treatment guideline in Swaziland supports the use of either the inhaler or oral medications or both for acute attack with no clear clarification as to when and how to use it. There is therefore also a need to update the Swaziland Asthma guideline to conform with current international guidelines such as the South African and GINA guidelines. The author will assist with the implementation of updated evidence-based guidelines in RFMH and in the country at large.

## **10. Conclusions**

This research study shows that knowledge related to childhood asthma and its management of caregivers of children with asthma in Swaziland show room for improvement. Most caregivers had a negative attitude regarding MDI use, which prevents them from using reliever and controller MDIs appropriately. Some of the barriers to the effective management of asthma are caregiver misconceptions about inhalers, poor level of service given by health professional which included absence of regular follow up appointments and lack of evidence-based national asthma guidelines. The KAP of caregivers of children with asthma attending the RFMH in Swaziland demonstrate that asthma related education and management programs show room for improvement. Special attention should be given to educate caregivers regarding their children who are suffering from chronic diseases such as asthma at RFMH, as well as in the country at large.

## 11. References

1. GINA\_Report\_2014\_Aug12.pdf [Internet]. [cited 2015 Mar 2]. Available from: [http://www.ginasthma.org/local/uploads/files/GINA\\_Report\\_2014\\_Aug12.pdf](http://www.ginasthma.org/local/uploads/files/GINA_Report_2014_Aug12.pdf)
2. WHO | Asthma [Internet]. WHO. [cited 2015 Mar 2]. Available from: <http://www.who.int/mediacentre/factsheets/fs307/en/>
3. Macintyre UE, de Villiers FP. Increase childhood asthma admissions in an urbanized population. 2001 ;91(8):667–72.
4. Gerald JK, Sun Y, Grad R, Gerald LB. Asthma Morbidity Among Children Evaluated by Asthma Case Detection. *Pediatrics*. 2009 Nov 1;124(5):e927–33.
5. Halfon N, Newacheck PW. Childhood Asthma and Poverty: Differential Impacts and Utilization of Health Services. *Pediatrics*. 1993;91(1):56–61.
6. Jing Zhao<sup>1</sup>, Kunling Shen<sup>2</sup>, Li Xiang<sup>2</sup>, Guoqing Zhang<sup>1</sup>, Meng Xie<sup>1</sup>, Juan Bai<sup>1</sup>, et al. The knowledge, attitudes and practices of caregivers of children with asthma in 29 cities of China: a multi-center study. 2013. 13(20):1471–2431.
7. Foreign Direct Investment in Africa - Some Case Studies - WP/02/61 - wp0261.pdf [Internet]. [cited 2015 Mar 7]. Available from: <http://www.imf.org/external/pubs/ft/wp/2002/wp0261.pdf>
8. McIvor RA, Chapman KR. The coming of age of asthma guidelines. *The Lancet*. 2008 372(9643):1021–2.
9. Mavale-Manuel S, Duarte N, Alexandre F, Albuquerque O, Scheinmann P, Poisson-Salomon AS, et al. Knowledge, Attitudes, and Behavior of the s of Asthmatic Children in Maputo. *J Asthma*. 2004 1;41(5):533–8.
10. El Ftouh M, Yassine N, Benkheder A, Bouacha H, Nafti S, Taright S, et al. Paediatric asthma in North Africa: the Asthma Insights and Reality in the Maghreb (AIRMAG) study. *Respir Med*. 2009 ;103 Suppl 2:S21–9.
11. Zorc JJ, Scarfone RJ, Li Y. Predictors of primary care follow-up after a pediatric emergency visit for asthma. *J Asthma Off J Assoc Care Asthma*. 2005;42(7):571–6.
12. Zuniga GC, Kirk S, Mier N, Garza NI, Lucio RL, Zuniga MA. The Impact of Asthma Health Education for s of Children Attending Head Start Centers. *J Community Health*. 2012.31;37(6):1296–300.
13. Conn KM, Halterman JS, Fisher SG, Yoos HL, Chin NP, Szilagyi PG. al Beliefs About Medications and Medication Adherence Among Urban Children With Asthma. *Ambul Pediatr*. 2005;5(5):306–10.

14. Yilmaz O, Eroglu N, Ozalp D, Yuksel H. Beliefs about Medications in Asthmatic Children Presenting to Emergency Department and Their caregivers. *J Asthma*. 2012;49(3):282.
15. Williams LK, Pladevall M, Xi H, Peterson EL, Joseph C, Lafata JE, et al. Relationship between adherence to inhaled corticosteroids and poor outcomes among adults with asthma. *J Allergy Clin Immunol*. 2004;114(6):1288–93.
16. Adeloye D, Chan KY, Rudan I, Campbell H. An estimate of asthma prevalence in Africa: a systematic analysis. *Croat Med J*. 2013;54(6):519–31.
17. Swaziland Demographic and Health Survey 2006-07.
18. Ehrlich RI, Jordaan E, du Toit D, Volmink JA, Weinberg E, Zwarenstein M. Under recognition and under treatment of asthma in Cape Town primary school children. *South Afr Med J Suid-Afr Tydskr Vir Geneeskde*. 1998;88(8):986–94.
19. Asthmatic Children Cape Town knowledge and attitude. *J Asthma*. 2000;37(6):519–28.
20. The Global Asthma Report 2014 [Internet]. [cited 2015 Mar 11]. Available from: <http://www.globalasthmareport.org/>
21. Cleveland KK. Evidence-based asthma education for caregivers. *J Spec Pediatr Nurs JSPN*. 2013;18(1):25–32.
22. Guideline for the management of acute asthma in children: 2013 update | Kling | South African Medical Journal [Internet]. [cited 2015 Mar 6]. Available from: <http://www.samj.org.za/index.php/samj/article/view/6658/4940>.
23. Addo-Yobo EO, Custovic A, Taggart SC, Craven M, Bonnie B, Woodcock A. Risk factors for asthma in urban Ghana. *J Allergy Clin Immunol*. 2001;108(3):363–8.
24. Validation of an asthma knowledge questionnaire - FITZCLARENCE - 2008 - Journal of Paediatrics and Child Health - Wiley Online Library [Internet]. [cited 2015 Jul 22]. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1440-1754.1990.tb02429.x/abstract;jsessionid=D06EC8E1F2756601E93A115953A34346.f01t04>
25. Ministry of Health (2016). Trend analysis report. Epidemiology and Disease Control Unit, Mbabane, Swaziland.
26. Standard Treatment Guidelines and Essential Medicines list of common Medical Conditions in the kingdom of Swaziland.
27. Zaraket, R., Al-Tannir, M.A., Abdulhak, A.A.B., Shatila, A., Lababidi, H., 2011. Parental perceptions and beliefs about childhood asthma: a cross-sectional study. *Croat Med J* 52, 637–643. <https://doi.org/10.3325/cmj.2011.52.637>

28. Jones, S.L., Weinberg, M., Ehrlich, R.I., Roberts, K., 2000. Knowledge, Attitudes, and Practices of s of Asthmatic Children in Cape Town. *Journal of Asthma* 37, 519–528. <https://doi.org/10.3109/02770900009055479>.
29. IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.
30. Zhao, J., He, Q., Zhang, G., Chen, Q.et al. 2012. Status of asthma control in children and the effect of s' knowledge, attitude, and practice (KAP) in China: a multicenter study. *Annals of Allergy, Asthma & Immunology* 109, 190–194. <https://doi.org/10.1016/j.anai.2012.07.005>.
31. Rastogi, D., Madhok, N., Kipperman, S., 2013. Caregiver Asthma Knowledge, Aptitude, and Practice in High Healthcare Utilizing Children: Effect of an Educational Intervention. *Pediatr Allergy Immunol Pulmonol* 26, 128–139. <https://doi.org/10.1089/ped.2013.0226>.