

Knowledge, Attitude, Practices and Self-Management of Asthma among Students of Secondary School in Lome during Physical and Sport Activities

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Abstract

Background: Asthma is the most common disease in school-aged children, and the prevalence rate is increasing every year. In Africa, the prevalence is high in schools and reaches 16.8% among students and more particularly during Physical Activities (PA), where physical exercises contribute to the increase of the frequency of cases of asthma attack. In Togo, the prevalence rate being very high, a survey on the management of this disease could be beneficial.

Objective: This study aims to assess students' knowledge, practices and self-management of asthma during physical activities.

Methods: It was a cross-sectional study, by questionnaire, carried out from February to September 2020 among 40 asthmatics from secondary schools in Lome aged 11 to 18 years. The participants were students who had documentation proving that they had asthma and who had agreed to participate in the study. A questionnaire containing information on adherence with treatment, knowledge of inhalation technique. Data were analysed using IBM SPSS statistics version 19.0 for Windows (SPSS Inc., an IBM Company, and Chicago, IL, USA).

Results: The participation rate was 60.6%. The average age was 14.1 ± 2.2 years, with the extremes of 11 and 18 years. The Sex Ratio (SR) of the participants was 1.22 with a predominance of men in the total number of this survey: 22 men (55%) and 18 women (45%). During an asthma attack, attitudes varied depending on how long the asthma lasted, but the difference is not significant. The majority (62.5%) had a low level of knowledge about their asthma treatment, and 50% had no adherence to treatment. Most of them (50%) ignore inhalation techniques.

Conclusion: There is insufficient knowledge of asthma treatment and treatment adherence among students with asthma in secondary schools in Lome. Awareness is essential.

Keywords: Self-management • Asthma • Students • Physical activities • Lome

Highlights

- In Togo, asthma is a serious public health problem.
- Its prevalence among students is 23.4%.
- An asthma self-management survey could be beneficial to provide effective management.

- 40 participants were retained and 85% had no control of the inhalation technique, 50% had no adherence to treatment.
- There is insufficient knowledge of asthma treatment and treatment adherence among students with asthma in secondary schools in Lome.

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Introduction

According to the GINA updated in 2019, asthma is a disease accompanied by symptoms such as wheezing, shortness of breath, a feeling of tightness in the chest or a cough, that the occurrence, frequency, and intensity varies over time [1]. In Togo, asthma is a serious public health problem. Its prevalence in schools is 23.4% [2]. The prevalence of asthma is high in schools and reaches 16.8% among students in Africa [3], and more particularly during Physical Activities (PA), where physical exercises contribute to the increase of the frequency of cases of asthma attack [4]. Researching information from a questionnaire on the self-management of asthma in students could be beneficial to allow better recognition and therefore better management of this disease.

Childhood asthma is a serious global health burden. Although asthma cannot be cured most of the time, asthma symptoms can be controlled. The management of children with asthma aims to allow them to lead a normal life with normal pulmonary functions, but in clinical practice, few asthmatics exhibit optimal control of this chronic condition [5]. It is therefore important to involve students in the management of their asthma during PA. It is not always easy to find a way around asthma. Certainly, there are very effective drugs to control the disease, but despite the availability of effective treatments, asthma control in children and adolescents remains inadequate and rates of health care use are high, but the person must nevertheless adhere to a rather heavy schedule [6]. As a result, she must take his treatment accordingly, know how to assess the severity of his disease and act appropriately in the face of a crisis [7].

All this is not obvious and the person with asthma sometimes feels alone and helpless in front of all these behaviours to adopt, especially since the physical education and sports teacher does not always have enough time to take care of all the pupils, especially in cases of excessive numbers in Lome schools. Currently, one of the challenges is to provide personalized therapeutic education with the goal of improving children's self-management skills. Currently, one of the challenges is to provide a self-management educational program, which is considered an important part of routine asthma care, with a view to improving children's self-management skills. Thus, the student, during physical education sessions, must be able to adopt a preventive attitude against asthma attacks in order to carry out the physical activity programs submitted [8].

The aim of this study is to assess the knowledge, attitudes and practices of students with asthma during physical and sports activities.

Materials and Methods

Design, sampling and study setting

The present study is an analytical cross-sectional survey involving 40 asthmatics of both sexes aged 11 to 18 years from secondary schools in Lome, Togo. The study was conducted from February 12 and September 17, 2020.

The participants in this study were students who had documentation proving that they had asthma and who had agreed to participate in the study. Initially, 66 students agreed to participate in

the study. Of these, twenty-six (26) students who did not have documented evidence of asthma were excluded from the study. The questionnaire was finally administered to 40 students with asthma who met the inclusion criteria.

Inclusion criteria were as follows:

- Have documentation proving that they had asthma.
- Being pupils aged 11 to 18 residing in Lome that gave consent.
- Willingness to freely participate in the survey.

Exclusion criteria were as follows:

- Students who did not have documents proving that they are asthmatic.
- Pupils aged 11 to 18 who are not residing in Lome.
- Pupils who did not have the will to freely participate in the survey.
- Pupils and parents or guardians unable to respond to questions.

Data sources

We collected data from the questionnaire inspired by the Morisky model (4 items) [9], and supplemented by a certain number of items relating to the practice of PA, making it possible to collect information on adherence with treatment, knowledge of the technique of inhalation of pressurized metered dose aerosols, asthma preventive attitude and behaviour to be taken in the face of an asthma attacks during the practice of PA, measurement of Peak Expiratory Flow (PEF). The answers were collected immediately.

Operational definitions

The following definitions were considered in this study: Asthma self-management refers to the things you can do for yourself to keep your asthma in control, have fewer asthma symptoms, and enjoy life. The best medicines and best healthcare providers in the world can only do so much to help you manage your asthma if you are not also doing your part. For this reason, self-management is essential.

Adherence is defined as the extent to which a person's behaviour (taking medication, following a diet, and/or executing lifestyle changes) corresponds with agreed recommendations from a health care provider.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics version 19.0 for Windows (SPSS Inc., an IBM Company, and Chicago, IL, USA). *Chi squared* tests were used to derive the differences between groups for categorical variables. The qualitative variables were expressed in numbers and in percentage, the quantitative variables in mean and standard deviation. The preventive attitude and the behaviour adopted during an asthma attacks during the practice of PA were compared in pupils with asthma lasting less than 10 years and in those whose asthma was more than 10 years old. The level of significance for all statistical measures was set at $p < 0.05$.

Results

Sex ratio and average age

The Sex Ratio (SR) of the participants was 1.22. It shows the predominance of males over the total workforce in this survey: 22

males (55%) and 18 females (45%). Depending on age groups, the SR has always shown a predominance of males in all age groups. Table 1 presents the summary characteristics of the study participants. The age range of this study participants was 11-18 years. The average age was 14.1 years (SD \pm 2.2) with the extremes of 11 years and 18 years.

Age	Males (n=22) n (%)	Females (n=18) n (%)	Sex-ratio
11-12 years	7 (31.82)	6 (33.33)	1.17
13-14 years	5 (22.73)	4 (22.22)	1.25
15-16 years	6 (27.27)	5 (27.78)	1.2
17-18 years	4 (18.18)	3 (16.67)	1.3

Table 1. Distribution of participants to the questionnaire by sex and age.

The attitude of students with asthma

The preventive attitudes varied depending on how long asthma lasted. Students with asthma over 10 years old were the most numerous (09 students out of 14 or 64.29%) to adopt preventive

attitudes towards an asthma attacks during the practice of PA compared to those under 10 years old (16 students out of 26 or 61.54%) but the difference is not significant. Also, in both cases, there were a significant proportion of students who reported having no disposition to prevent an asthma attack (20% for asthma older than 10 years and 35% for those under 10 years) (Table 2).

Attitude	Asthma<10 years (n=26) n (%)	Asthma>10 years (n=14) n (%)	P
Preventive attitude			
Taking bronchodilators	3 (11,54)	2 (14,29)	0.8021
Drugs nearby	3 (11,54)	2 (14,29)	0.8021
Avoidance of allergens	2 (7,69)	3(21,43)	0.2102
Regular hydration	3 (11,54)	2 (21,43)	0.8021
Avoidance of cold and dry air	5 (19,23)	2 (21,43)	0.6946
No disposition	10 (38,46)	3 (21,43)	0.2726
Attitude to an asthma attack			
Stopping the activity	7 (26,92)	4 (28,57)	0.9113
Taking medication	6 (23,08)	3 (21,43)	0.9052
Contact of parents or doctor	4 (15,38)	3 (21,43)	0.6313
No disposition	9 (34,62)	4 (28,57)	0.8971

Table 2. Frequency of responses in relation to the preventive attitude of asthma and the behaviour to be taken in the face of an asthma attack during the practice of PA.

In the event of an asthma attacks during PA, students with asthma over 10 years were numerous (71, 42%) to know the correct attitude to adopt. Also, in both cases, there were a significant proportion of students who reported having no disposition during an asthma attack.

Advice given by the doctors to students with asthma

Among the students questioned, 11 or 27.5% reported having received advice from doctors, the exclusion from all sports. On the other hand, 08 students or 20% received advice, the exclusion from certain sports disciplines. The majority (15 students or 37.5%)

received advice; request a certificate of stopping PA. Only a minority (6 students or 15%) received recommendations to practice PA to alleviate their asthma attack, (Figure 1).

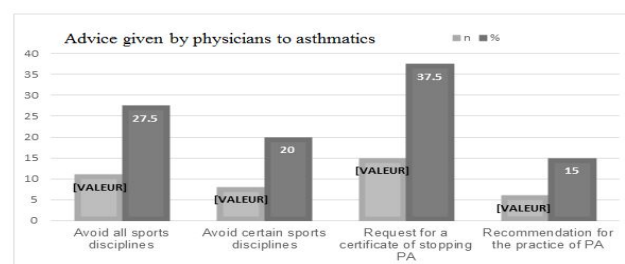


Figure 1. Frequency of responses to the advice given by physicians to asthmatics in relation to the practice of PA.

Knowledge about asthma treatment, adherence to treatment and control of inhalation techniques. The results of Table 3 show that a proportion of 62.5% of students had a low-level of knowledge about their asthma treatment. Compared to the adherence, 08 students or 20% declared a total adherence to their treatment, while 10 students or 30% declared a partial adherence. Most (22 students or 50%) have no observance of a basic treatment.

Attitude (n=40)	n	%
Knowledge of treatment		
Good level of knowledge	15	37.5
Low level of knowledge	25	62.5
Adherence to treatment		
Total adherence (Total score=4)	8	20
Partial adherence (total score between 2 and 3)	10	30
No adherence (Total score less than 2)	22	50
Control of inhalation techniques		
Total control	9	22.5
Partial control	11	27.5
No control	20	50
PEF measurement		
Use of peak flow meter	6	15
No use of peak flow meter	34	85

Table 3. Frequency of responses relating to treatment, adherence to treatment, knowledge of metered-dose inhalation technique and measurement of PEF .

The causes of non-adherence were adverse drug reactions (7.5%), not understanding the prescription or doctor's instructions (15%), forgetting medications at home (10%), high cost of medication (10%) and poor knowledge of the disease (12.5%) (Figure 2).

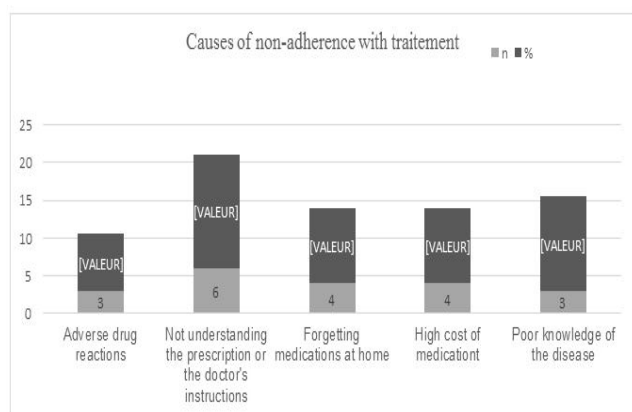


Figure 2. Frequency of responses to causes related to non-adherence with treatment.

Discussion

The main objective of the present study was to assess the knowledge, attitudes and practices of students with asthma during

In the event of asthma attack during the practice of PA, 09 students or 22.5% fully succeeded in controlling the technique of inhaling metered-dose inhalers. On the other hand, 34 students or 85% had no control of this technique. Compared to the PEF measurement, 06 students or 15% use the peak flow meter to monitor the progress of their asthma (Table 3).

PA. Children with asthma were more often boys. This male predominance was also verified in a study carried out in a school environment in the commune of Lome [10], and in another study carried out in Algiers among households among children and young adults [11].

A wide variety of information was collected, showing the involvement of students in the management of their asthma during physical activities. The analysis of 40 questionnaires in children aged 11-18 provides information on many aspects that students suffering from asthma must understand obtaining and maintain control of their disease: control of inhalation techniques, knowledge of techniques basic asthma, preventive attitudes before PA, measurement of PEF etc.

Asthma and physical activity should not be separated. Habitual, physical activity appears to have a protective role in the development of chronic illness in general, as well as in developing bronchial asthma both in children and adults [12]. The deconditioned asthmatic children must be encouraged to participate in sports activities, but above all they must be guided and supported in their practice or re-training. High awareness remains essential to correct this notion among treating physicians. Exercise asthma is not a contraindication to sport in children with asthma, and in no way justifies the exemptions from PA.

In this study, the majority (15 students or 37.5%) received advice from the doctor, the request for a certificate of stopping PA while asthma remains accessible to therapies administered a few minutes before the exercise. Our study confirms the results of the national survey of doctors and interns in Togo carried out by Hounkpati et al., which showed that 44% of doctors who took care of at least one asthmatic, advised against sporting activity for their patients [13].

The knowledge about the treatment of asthma by students with asthma is important to ensure optimal and lasting control of the disease. In our study, the proportion of students with a low-level of knowledge about their asthma treatment was 62.5%. A study of a review of the narrative literature surveys used to assess the level of drug adherence in children and adolescents with asthma, the attitudes of these patients and their parents towards asthma treatment was carried out. This study revealed a lack of patient knowledge about the disease and its treatment, and advocates for the education of patients and their parents on necessary asthma care [14]. The practical implications of our study are found in the need to strengthen children's knowledge of asthma treatment. In Japan, the participation of children with asthma and their families in an understanding and self-management program reduced the frequency and severity of asthma attack, increased school attendance and participation in group activities [15]. For optimal management of asthmatic disease, it is necessary that the patient has knowledge.

In our study, the rate of non-adherence to treatment, which was 50%, is slightly lower than that of Dondi, et al. who showed that 67% of children aged six years and over did not use any medication for asthma control. Both studies suggest that a significant number of children do not follow the treatment [16]. Among the causes of non-adherence, those linked to not understanding the prescription or the doctor's instructions relate to the study by Apter, et al. which showed that a poor understanding of medical data was associated with poor disease control [17]. The cause of non-adherence linked to poor knowledge is in accordance with the study by Amin et al., which assessed therapeutic adherence in asthma patients by their points of view and showed that the insufficiency of communication between doctor and patient, poor knowledge about the disease, affects medication adherence in chronic diseases like asthma [18]. The causes of non-adherence, including forgetting medications at home, found in our study relate to the studies by Koster [19]. Other causes of medication non-adherence, related to the high cost of asthma medication, are similar to other studies.

Adherence rates among asthma patients are generally low and decrease during adolescence, resulting in poorly controlled asthma. The needs for autonomy and normality of adolescence explain the behaviours of rejection of adolescents with asthma, opposites their disease and therefore treatment. It is difficult for them to perceive asthma as a chronic disease and to assimilate the benefit of the treatment offered. Inadequate patient adherence to prescribed treatment regimens is a major cause of poor clinical outcomes in the treatment of asthma. The patient's understanding of the purposes of managing their disease is necessary for adherence to the therapeutic plan.

Usually, the diagnosis of asthmatic disease is announced to the parents because of the young age of children. This information retransmitted to children may be different from the initial information, since it is nuanced according to the parent's experience with the

disease. This influences considerably how the child understands the disease. It is desirable that the nursing staffs involves the children during interviews with the parents. Adapting the medical discourse to each patient is essential to facilitate understanding of the disease. Reformulation, a technique used in motivational interviews, will help ensure that the information is understood.

Using inhalers seems simple, but it takes some technique to be effective. In our study, most of the students suffering from asthma (50%) do not master metered-dose inhaler techniques, although serious inhalation technique errors can interfere with drug delivery to the lungs. Price et al. seem to confirm this hypothesis by claiming that an incorrect inhalation technique is a frequent cause of poor asthma control. The minimum controlling dose of treatment must be established in patients with asthma. This high proportion of students with poor inhalation technique in our study could be related to the lack of education in this technique because of the large number of doctors who do not teach it to their patient. This situation can be explained by poor mastery of the inhalation technique by the doctors themselves. Importantly, education and support are crucial not only to enable patients to recognize the need for optimal disease management, but also to help them develop good inhaler technique. In addition, health care professionals should also aim to increase their knowledge of the devices they prescribe, and develop systems to ensure that they offer comprehensive support to patients in clinical practice. It must be recognized that inhaled drugs represent an essential part of the treatments administered in pulmonology. Whatever the intended application, the control of the administration system and its use plays a major role because it determines the way in which the active principle will be deposited in the airways and thus its effectiveness.

The recording of variation of peak expiratory flow is one of the parameters that assess the severity of asthma, which allows adopting at best the basic treatment. The benefits of measuring PEF as an educational tool to promote adherence, found in one study, were used by a minority (15%) of asthmatics in our study. This underlines the interest of including these adolescents in one of the therapeutic education sessions.

Attitude towards an asthma attacks varied according to the age of the disease in our study. Our results agree with those of Maurer, et al. Which, in their prospective observational study concerning 280 patients consecutively treated from 2008 to 2011, showed that patients who mastered all the educational skills had old (>10 years) and controlled asthma. In our study, students who had asthma since childhood had a better control over the behaviour to be taken in case of an asthma attacks than those with recent asthma (<10 years). This situation reflects therefore the acquisition of a certain maturity and involvement in the management of their asthma.

Limitations

Our study has some limitations that deserve to be discussed. The first limit concerns the risk of memory errors in relation to the attitudes on which the pupils are questioned. This often results in either overestimating or underestimating the response to questions. The second limitation comes from difficulties in understanding certain terms by the students [20].

Strengths

The results of this study enabled the head of education to become aware of the insufficient knowledge of asthma treatment and treatment adherence among students suffering from asthma in secondary schools in Lomé.

Conclusion

This study of the self-management of asthma during PA has shown that there is insufficient knowledge of asthma treatment and treatment adherence among students suffering from asthma in secondary schools in Lomé. These deficiencies negatively influence the self-management of asthma by children with asthma during PA practices in school. It is, therefore, necessary to set up a therapeutic education program for asthmatics to improve their knowledge of the treatment of the disease, which will have a positive effect on the control of asthma. It therefore seems important to develop a national guide for continuing education of students in the self-management of asthma in schools. All this will improve the socio-educational development of students with asthma and allow them to practice physical activities freely.

Ethical considerations

The results of the study are presented clearly, honestly, and without fabrication, falsification, or inappropriate data manipulation. All precautions have been taken to respect the privacy of subjects, the confidentiality of data concerning them. The study was performed according to the Declaration of Helsinki and was approved by the bioethics' committee for health research in Togo (authorization n°005/2019/CBRS of March 14, 2019). Informed consent was obtained from the parents of each participant before the beginning of the survey. This approach in the study is based on evidence of a close correlation between parental reports and objectively measured physical activity in their children. The participants were volunteers without a monetary incentive, and they were informed about the use of their information.

Conflict of Interest

The authors declare that they have no conflicts of interest in relation to this article.

Authors' Contribution

- Akpadi Kouma Tarsiba: Conceptualization, methodology, software, writing original draft preparation, writing-review and editing,
- Yendoube T. Kantati: Data curation, formal analysis,
- Metowogo Kossi: Visualization, investigation,
- Gafarou-Toure Abdoul Alassane: Resources,
- Kwashie Eklou-Gadegbeku: Supervision,
- Kodjo Akikokou: Project administration,
- Kpemissi Maboizou: Writing-reviewing and editing,

All authors approved the final version of the manuscript.

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