Asthma knowledge among primary and secondary school teachers in rural northern Costa Rica

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ABSTRACT: Asthma is a chronic inflammatory disease of the airways. It is very common among children and is a major cause for emergency room visits and missed school days. Costa Rica has one of the highest rates of childhood asthma in the world; so it is important for teachers to know how to prevent and treat asthma attacks in the classroom. Since schools in rural Costa Rica had not yet been studied, teachers were sampled from six schools in Venecia and Aguas Zarcas, San Carlos. During March and April 2014, 185 asthma questionnaires were collected. Among these teachers, 51% were aware of asthmatic students in their classes, and 19% recalled witnessing an asthma attack in the classroom. Interest in asthma training was high among 85% of the teachers, and the preferred format was a lecture or workshop. Greater asthma knowledge was significantly related to living with an asthmatic person (p=0,014), but not with being asthmatic, having asthmatic students, witnessing an asthma attack in the classroom, sex, age, education level, or teaching experience. Greater interest in asthma training was related to awareness of asthmatic students (p=0,031), prior experience with an asthma attack in the classroom (p=0,033), and greater asthma knowledge (p=0,022). Primary school teachers were more likely to be aware of asthmatic students in their classes compared to secondary school teachers (p=0,002).

Key words: asthma attack; asthma knowledge; Costa Rica; public health; rural schools; teachers.

RESUMEN: El asma es una enfermedad crónica e inflamatoria muy común entre los niños. Es una de las mayores causas de consulta médica y de días escolares perdidos. Costa Rica tiene una alta prevalencia mundial de asma infantil; así que es importante que los docentes sepan prevenir y tratar las crisis asmáticas en el aula. A causa de una falta de estudios en las aulas rurales, se decidió estudiar a los docentes de cuatro escuelas y dos colegios de Venecia y Aguas Zarcas de San Carlos. Durante marzo y abril de 2014 se recolectaron 185 cuestionarios sobre el asma. 51% sabía de estudiantes asmáticos en sus clases, y 19% había presenciado una crisis asmática en el aula. El interés en alguna capacitación sobre el asma fue alto entre 85% de los docentes, y los formatos preferidos fueron charlas y talleres. Mayores conocimientos sobre el asma se relacionaron significativamente con vivir con un asmático (p=0,014), pero no con ser asmático, tener estudiantes asmáticos, haber presenciado una crisis asmática en el aula, sexo, edad, nivel educativo o experiencia como docente. Mayor interés en alguna capacitación se relacionó con conocimiento de estudiantes asmáticos (p=0,031), experiencias previas con una crisis asmática en el aula (p=0,033) y mayores conocimientos sobre el asma (p=0,022). Los maestros de las escuelas primarias tenían más conocimiento de los estudiantes asmáticos que los profesores de los colegios (p=0,002).

Palabras claves: crisis asmática; conocimientos sobre el asma; Costa Rica; salud pública; escuelas y colegios rurales; docentes.

Asthma is a chronic inflammatory disease of the airways characterized by bronchospasm, an inflammation of the smooth muscles in the bronchi. The main symptoms of asthma are difficulty breathing, wheezing, and chronic dry cough (Kline-Krammes, Patel & Robinson, 2013). Common triggers for asthma exacerbations include dust mites, animal dander, cockroaches, pollen, mold, and other allergens; air pollutants and tobacco smoke; viral respiratory infections; aspirin and other drugs; stress; and sometimes exercise (Murata & Ling, 2012). Additional risk factors include certain foods and area of residence, especially hot and humid areas (Soto-Martínez & Soto-Quirós, 2004).

Severe asthma can lead to respiratory failure if not treated quickly (Murata & Ling, 2012). The cost of treating asthma is high, especially because it can lead to one or more ER visits per year. It is the leading cause of missed school days and it can affect a child's sleep and academics (Kline-Krammes et al., 2013). Asthma can be socially and emotionally harmful for a child due to reduced participation in recess, sports, vacations, and other activities (Gutiérrez & Chavarría, 2000; Williams et al., 2010).

Unfortunately, there is no cure for asthma. Instead, treatment should focus on controlling environmental triggers, maintaining physical activity, and teaching management skills to the patient, parents, and other caretakers (Korta Murua & López-Silvarrey Varela, 2011). When an asthma attack does occur, immediate treatment with bronchodilators is necessary. The principal medications for asthma are beta-agonists, systemic corticosteroids, and ipratropium bromide (Kline-Krammes et al., 2013). The recommended immediate therapy for acute asthma attacks is short-acting beta-agonist (SABA) drugs, which rapidly relax bronchial smooth muscles. The most common SABA is salbutamol, administered in a metered-dose inhaler (Murata & Ling, 2012). Barriers to asthma management include low medication compliance, poverty, transportation difficulties, inconvenient clinic hours, limited communication between schools and families, and the lack of written asthma action plans (Toole, 2013).

Based on the most recent International Study of Asthma and Allergies in Childhood (conducted 2000-2003), Costa Rica consistently had one of the highest rates of childhood asthma in the world (Lai et al., 2009). The prevalence of asthma among Costa Rican children increased from 23,4% in 1989 to 33,2% in 2002. This escalation might be explained by improvements in the clinical diagnosis of asthma; environmental changes, such as increased air pollution; and lifestyle changes, such as decreased nutrition and physical activity (Soto-Martínez & Soto-Quirós, 2004; Cooper, Rodriguez, Cruz & Barreto, 2009). According to a study among asthma patients in the Hospital Nacional de Niños in San José, many parents waited too long to seek medical treatment, which led to costly emergency services. A high percentage of patients lacked regular medical treatment despite national health coverage and improvements in asthma medications. These results indicate a need for improved preventative health in Costa Rica (Gutiérrez & Chavarría, 2000).

Many studies have indicated a lack of asthma knowledge among teachers worldwide (Getch & Neuharth-Pritchett, 2009; Bruzzese et al., 2010; Rhee, Wyatt & Wenzel, 2006; Angulo, 2013). According to a study in Spain, only 35,9% of teachers had received some type of information about the first steps to follow during a student's asthma attack (Rodríguez Fernández-Oliva, Torres Álvarez de Arcaya& Aguirre-Jaime, 2010). The best strategy for asthma management includes patient education, a written asthma action plan, early recognition of symptoms, and rapid treatment of asthma exacerbations (Kline-Krammes et al., 2013). The cooperation of an asthmatic child's teachers is essential for all of these efforts. Similarly, researchers in Chile suggest that educating community members—including teachers—is essential for helping parents detect asthma in their children, seek specialized assistance, and avoid unnecessary treatments for their children (Mallol et al., 2000).

Costa Rican schools generally do not have a school nurse, which is why the teachers play such an important role in the management of students' asthma and other medical conditions. It is possible that many teachers might not recognize the symptoms of an asthma attack. This could have serious consequences for the children; a severe asthma attack may require intubation and can even be fatal. The teachers cannot be blamed, because this deficiency exists at the institutional rather than the individual level. There are few studies about teachers' asthma knowledge in Costa Rica specifically. Most asthma studies in Latin America have been conducted in urban areas, where risk factors include extreme social inequalities and lack of access to basic infrastructure (Cooper et al., 2009), but these risk factors may apply to rural areas as well. I loosely based this study's questionnaire on a previous asthma knowledge study that was conducted in a San José primary school (Angulo, 2013). To expand on this subject, I decided to research teachers' asthma knowledge in rural Costa Rica.

By means of an asthma survey, I aimed to: a) measure the proportion of teachers that have witnessed an asthma attack in the classroom and investigate the actions that they took; b) determine teachers' awareness about asthma attack prevention, triggers, symptoms, and medications; and c) gauge teachers' interest in asthma training. The goal of this study is to contribute to an understanding of the current level of asthma knowledge in rural Costa Rican schools.

METHODS AND MATERIALS

Study Area, Sample Size, and Participants: Venecia and Aguas Zarcas are located in the canton of San Carlos, in the north-central province of Alajuela, Costa Rica. Their approximate populations are 6 000 and 13 000, respectively. These rural towns have a very warm and rainy climate. The mean annual temperature ranges from 17 to 24°C, with a mean annual rainfall of 3768 mm over an average of 226 days per year (Solano & Villalobos, 1996). Six public schools participated in this study: one secondary school and four primary schools in Venecia, and one secondary school in Aguas Zarcas.

The overall participation rate was 88,9%, providing a sample size of 185 teachers. Of these participants, 23% worked in a primary school (preschool through sixth grade) and 77% worked in a secondary school (seventh

through twelfth grade); 32% were men and 68% were women. Their ages ranged from less than 25 years to 59 years, but 67% were in their thirties or forties. Their teaching experience ranged from 1 to 20 or more years, but 62% had worked for 8 to 19 years. Some teachers held a high school, bachelor's, or master's degree, but 64% held a licenciatura degree (one to two years of technical training beyond a bachelor's degree). About 11% of the teachers were asthmatic, and 23% lived with an asthmatic person.

Methodology: The asthma questionnaire (Appendix A) consisted of 19 questions regarding demographics, personal experience with asthma, classroom experience with asthma, asthma knowledge, interest in an asthma training program, and comments. For the four knowledge questions (regarding asthma attack prevention, triggers, symptoms, and medications), more than one answer choice was allowed, and each question included one or two incorrect options. During March and April 2014, I distributed the questionnaires to the teachers during the school day, aiming to sample all teachers at the six schools. The participants also signed an informed consent form. Collection of the questionnaires and forms was performed later in the day or week, depending on the teachers' availability. I used a code system to separate the participants' names from their questionnaires. This study was approved by the ACM Ethics Panel and followed a specific plan for the protection of human research subjects.

Using the knowledge questions about asthma attack prevention, triggers, symptoms, and medications, I summed the correctly identified items and subtracted the incorrectly identified items to generate a Knowledge Score (KScore), which could range from -6 to +18. The levels of interest in asthma training (none, low, or high) were translated into a Training Score (TScore) of 0, 1, or 2, respectively.

Differences in mean KScores and TScores among teachers' various characteristics or experiences were estimated by parametric, one-way ANOVA. *A posteriori* comparisons between means were carried out with Least Significant Difference (LSD) and Scheffe tests. Some comparisons were accompanied by Chi-Squared tests. Dependency of "training interest" levels with "asthmatic student awareness" levels and "witnessed asthma attack" levels were estimated with contingency tables. Dependency of "asthmatic student awareness" levels between primary and secondary school teachers was also estimated with a contingency table. The questionnaire answers were entered and analyzed in Microsoft Excel, and statistical analysis was completed with Statgraphics Centurion XVI, Version 16.0 (Statpoint Technologies, Inc.). Statistical procedures followed Sokal and Rohlf (1995).

RESULTS

Among the teachers, 51% were aware of asthmatic students in their class, and 37% were not sure if they had asthmatic students or not. Among the primary school teachers, 67% reported that they had asthmatic students in their class, 19% reported no, and 14% did not know. These proportions contrasted with the secondary school teachers, of whom 46% reported asthmatic students, 10% reported no, and 44% did not know (X^2=13,05; df 2; p=0,002).

Furthermore, 19% (35 teachers) recalled witnessing an asthma attack in the classroom. Within this group, 80% called the student's parents or an ambulance, and 29% either helped or let the student use an inhaler, with some overlap between these responses. The most commonly identified strategies to prevent asthma attacks in the classroom were keeping the room clean (92%) and using a whiteboard instead of a chalkboard (83%). When asked about possible triggers of an asthma attack, teachers most commonly chose air pollution (89%) and allergens (87%). The majority of the teachers were able to identify the three main symptoms of an asthma attack: wheezing (73%), dry cough (52%), and rapid breathing (80%). For asthma medications, 99% of the teachers correctly identified the salbutamol inhaler, and the second most common choice was salbutamol syrup (52%), which is prescribed for small children. When asked about possible training to learn how to help asthmatic students, 85% of teachers expressed a high level of interest. The preferred types of training were a lecture or workshop, but some teachers were interested in written information or an educational skit.

With a possible maximum of 18, the participants' KScores ranged from 3 to 17. The mean KScore was 10,26 with a standard deviation of 2,85. Statistically significant relationships were found within the categories of "asthmatic family member" and "interest in asthma training" (Table 1).

The TScore ranged from 0 to 2 with a mean of 1,84 and a standard deviation of 0,41. Teachers who knew they had asthmatic students were more interested in asthma training than the other teachers (X^2=9,14; df 4; p=0,058). Teachers who reported that they could not recognize an asthma attack had the highest mean TScore (2,00), followed by those that had witnessed an asthma attack (1,86), then those who had not (1,85), and finally those who could not remember (1,43) (Table 2). Thus,

TABLE 1
Differences in asthma knowledge among participants

Characteristic of teachers	Group with **greatest** mean KScore	Group with **smallest** mean KScore	ANOVA F-statistic	Degrees of freedom	P-value
School level	Secondary (10,28)	Primary (10,16)	0,06	(1, 182)	0,81
Sex	Female (10,45)	Male (9,83)	1,90	(1, 182)	0,17
Age group	40-49 years (10,50)	< 25 years (7,67)	1,01	(4, 179)	0,40
Experience as teacher	8-13 years (10,66)	14-19 years (9,55)	1,18	(4, 179)	0,32
Education level	High school (11,5)	Bachelor degree (10,03)	0,35	(3, 180)	0,79
Asthmatic	Yes (10,43)	No (10,23)	0,09	(1, 182)	0,77
Asthmatic family member	Yes (11,19)	No (9,96)	6,23	(1, 181)	0,014*
Asthmatic student in class	Yes (10,52)	No (9,82)	0,88	(2, 180)	0,42
Witnessed asthma attack in classroom	No (10,40)	Unsure, can't recognize an attack (9,75)	0,47	(3, 180)	0,71
Interest in asthma training	High (10,43)	Some (9,58) None (6,33)	3,91	(2, 181)	0,022*

* statistically significant at the 0,05 level.

TABLE 2
Differences in asthma training interest among participants

Characteristic of teachers	Group with **greatest** mean TScore	Group with **smallest** mean TScore	ANOVA F-statistic	Degrees of freedom	P-value
School level	Primary (1,88)	Secondary (1,82)	0,70	(1, 183)	0,41
Sex	Male (1,85)	Female (1,83)	0,05	(1,183)	0,83
Asthmatic	No (1,85)	Yes (1,76)	0,81	(1, 183)	0,37
Asthmatic family member	Yes (1,88)	No (1,82)	0,72	(1, 182)	0,40
Asthmatic student in class	Yes (1,91)	No (1,77) Don't know (1,75)	3,56	(2, 181)	0,031*
Witnessed asthma attack in classroom	Unsure, can't recognize an attack (2,00)	Can't remember (1,43)	2,63	(3, 180)	0,052

* statistically significant at the 0,05 level.

the teachers with the least interest in training were those that could not remember whether they had witnessed an asthma attack (X^2=13,72; df 6; p=0,033).

DISCUSSION

Areas for Improvement in Asthma Knowledge: It is alarming that so many teachers did not know whether they had asthmatic students in their class or not. This lack of awareness was higher for the secondary school teachers, who generally have more students than the primary school teachers, thus making it more difficult to keep track of their students' medical conditions. Several teachers wrote in the comments that it should be the institutions' responsibility to provide each teacher with a list of the asthmatic students. The need for better communication among students, parents, teachers, and administrators has been suggested in previous research (Rodríguez et al., 2010; López-Silvarrey Varela, 2011). Most teachers who witnessed an asthma attack did not help administer the salbutamol inhaler to the student. Although calling an ambulance or the student's parents is important, this should not be the first action. The medication must be administered as quickly as possible, because every minute counts during a severe asthma attack (Dr. Anabelle Alfaro, Emergency Medicine Specialist, 2014).

Overall, the results of the four knowledge questions paralleled those from a San José elementary school (Angulo, 2013). The teachers were generally aware of the main strategies to prevent asthma attacks in the classroom, with the exception of avoiding sharp temperature changes. This is difficult in Costa Rican schools since most classrooms are open to the air and the weather can change rapidly. Although asthma attack triggers differ among individuals, teachers should be aware of respiratory viruses, cold air, certain foods, some medications, and stress in addition to the commonly identified

air pollution and allergens. Most teachers recognized wheezing and rapid breathing as symptoms of an asthma attack, but they need to be more attentive to dry coughing and anxiety as well. It is excellent that almost all of the teachers recognized the salbutamol inhaler as an asthma medication, but they might not know how to use it correctly.

Fortunately, there was a high interest in asthma training, especially a lecture or workshop, which is consistent with studies in San José and Spain (Rodríguez et al., 2010; Angulo, 2013). An educational asthma intervention program for teachers should be individualized to the type of teacher and should emphasize recognition of symptoms and inhaler administration (Rodríguez et al., 2010). The Caja Costarricense de Seguro Social (The Costa Rican Social Security Administration) has already published a detailed guide for asthma exacerbations in children (Román Ulloa & Sáenz Campos, 2010). This guide can be used to design a training program, with the help of a health professional.

There was no clear relationship between the teachers' KScore and their age, experience, or education. Also, the trend that women had a higher KScore than men is consistent with a study in Istanbul, where asthma knowledge was greater for women, but was not related to age, education level, or length of tenure (Ones, Akcay, Tamay, Guler & Dogru, 2006). This indicates that teachers are not learning about asthma as a result of their career itself. However, teachers who lived with an asthmatic person had a higher KScore than those who did not, likely because caring for an asthmatic family member would increase familiarity with asthma attack prevention, triggers, symptoms, and medications. The influence of personal experience also increased the KScore for asthmatic teachers in comparison to non-asthmatic teachers, but the relationship was not as strong. The importance of personal experience is evident in previous studies (Getch & Neuharth-Pritchett, 2009; Rodríguez et al., 2010).

The teachers with higher KScores were highly interested in training, which is excellent, but the teachers with lower KScores were more likely to express little or no interest in training. This could lead to very negative consequences for their asthmatic students. The average TScore was higher for teachers who knew they had asthmatic students, as well as for the teachers who had either witnessed or could not recognize an asthma attack. It would be even better if the other groups expressed higher interest as well. A proactive approach is always better than a reactive approach, especially in the case of a life-threatening disease (Bruzzese et al., 2010).

Recommendations: It is important to consider the limitations of this study. Primarily, my questionnaire did not undergo a validation procedure, which hinders comparisons to other studies. Also, asking for numerical values, rather than ranges, for teachers' age and years of experience would have allowed more precise statistical tests, such as regression. To gain insight into teachers' attitudes about asthma, I should have included a question about the perceived danger of an asthma attack. Lastly, since I did not always monitor the participants, they may have shared answers or used online resources to answer the knowledge questions.

Training for teachers should focus on the prevention of asthma attacks in the classroom, recognition of symptoms, and the correct administration of a salbutamol inhaler while waiting for the ambulance or parents to arrive. A local pediatrician, asthma specialist, or public health official could provide training. To ensure that teachers are aware of asthmatic students in their classes, administrators should use the students' medical files to create and distribute a list of asthmatic students to each teacher. It is also advisable to include an inhaler in each classroom's first aid kit.

It would be beneficial to research current laws worldwide regarding teachers' abilities to care for students' medical needs, as well as teachers' comfort levels in administering medications like inhalers. Furthermore, interviews with parents and pediatricians of asthmatic children would reveal their concerns about asthma management at home and at school. When asthma training is provided to teachers, a follow-up study will be essential. If the results are satisfactory, then the training program should be extended to other schools in Costa Rica and Latin America.

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REFERENCES

Angulo Cordero, L. A. (2013). Conocimiento y actitudes sobre el asma bronquial por parte de los docentes de la escuela San Carlos Sanabria Mora durante el segundo semestre del 2013 (Unpublished medical doctoral thesis). Universidad Internacional de las Américas, San José, Costa Rica.

Bruzzese, J. M., Unikel, L. H., Evans, D., Bornstein, L., Surrence, K., & Mellins, R. B. (2010). Asthma knowledge and asthma management behavior in urban elementary school teachers. *Journal of Asthma*, *47*, 185-191. doi:10.3109/02770900903519908

Cooper, P. J., Rodrigues, L. C., Cruz, A. A., & Barreto, M. L. (2009). Asthma in Latin America: A public health challenge and research opportunity. *Allergy*, *64*, 5-17. doi:10.1111/j.1398-9995.2008.01902.x

Getch, Y. Q., & Neuharth-Pritchett, S. (2009). Teacher characteristics and knowledge of asthma. *Public Health Nursing*, *26*(2), 124-133. doi:10.1111/j.1525-1446.2009.00763.x

Gutiérrez, R., & Chavarría, J. F. (2000). Conocimientos y actitudes de los padres de niños asmáticos en relación al asma de Costa Rica. *Revista Médica del Hospital Nacional de Niños Dr. Carlos Sáenz Herrera*, *35*(1), 5-11. http://www.scielo.sa.cr/scielo.php?pid=S1017-85462000000100001&script=sci_arttext

Kline-Krammes, S., Patel, N. H., & Robinson, S. (2013). Childhood asthma: A guide for pediatric emergency medicine providers. *Emergency Medical Clinics of North America*, *31*(3), 87-103. doi:10.1016/j.emc.2013.05.001

Korta Murua, J., & López-Silvarrey Varela, A. (2011). Editorial: Asma, educadores y escuela. *Anales de Pediatría*, *74*(3), 141-144. doi:10.1016/j.anpedi.2011.02.005

Lai, C. K. W., Beasley, R., Crane, J., Foliaki, S., Shah, J., & Weiland, S. (2009). Global variation in the prevalence and severity of asthma symptoms: Phase Three of the International Study of Asthma and Allergies in Childhood (ISAAC). *Thorax*, *64*, 476-483. doi:10.1136/thx.2008.106609

López-Silvarrey Varela, A. (2011). *Estudio sobre el asma en los centros escolares españoles (EACEE) 2009-2010*. Fundación María José Jove, A Coruña, Spain. http://www.fundacionmariajosejove.org/wp-content/uploads/2014/02/Maqueta_final_publicacin_resultados_Estudio_Asma_Nacional_FMJJ_FBBVA_en_11.pdf

Mallol, J., Cortez, E., Amarales, L., Sánchez, I., Calvo, M., Soto, S., … Albornoz, C. (2000). Prevalencia del asma en escolares chilenos: Estudio descriptivo de 24.470 niños. *Revista Médica de Chile*, *128*(3), 279-285. doi:10.4067/S0034-98872000000300005

Murata, A., & Ling, P. M. (2012). Asthma diagnosis and management. *Emergency Medicine Clinics of North America*, *30*(2), 203-222. doi:10.1016/j.emc.2011.10.004

Ones, U., Akcay, A., Tamay, Z., Guler, N., & Dogru, M. (2006). Asthma knowledge level of primary schoolteachers in Istanbul, Turkey. *Asian Pacific Journal of Allergy and Immunology, 24*, 9-15. http://apjai.digitaljournals.org/index.php/apjai/article/viewFile/169/167

Rhee, H., Wyatt, T. H., & Wenzel, J. A. (2006). Adolescents with asthma: Learning needs and internet use assessment. *Respiratory Care*, *51*(12), 1441-1449. http://rc.rcjournal.com/content/51/12/1441.full.pdf+html

Rodríguez Fernández-Oliva, C. R., Torres Álvarez de Arcaya, M. L., & Aguirre-Jaime, A. (2010). Conocimientos y actitudes del profesor ante el asma del alumno. *Anales de Pediatría*, *72*(6), 413-419. doi: 10.1016/j.anpedi.2010.01.018

Román Ulloa, G., & Sáenz Campos, D. (2010). Exacerbaciones del asma en niños en el primer y segundo nivel de atención. Caja Costarricense de Seguro Social. Published online at http://www.ccss.sa.cr/

Sokal, R. R., & Rohlf, F. J. (1995). *The principles and practice of statistics in biological research*. New York: Edition 3.

Solano, J., & Villalobos, R. (1996). *Regiones y subregiones climáticas de Costa Rica*. Instituto Meteorológico Nacional, Gestión de Desarrollo. Retrieved from www.imn.ac.cr/publicaciones/

Soto-Martínez, M., & Soto-Quirós, M. (2004). Epidemiología del asma en Costa Rica. *Revista Médica del Hospital Nacional de Niños Dr. Carlos Sáenz Herrera*, *39*(1), 42-53. http://www.scielo.sa.cr/scielo.php?script=sci_arttext&pid=S1017-85462004000100005

Toole, K. P. (2013). Helping children gain asthma control: Bundled school-based interventions. *Pediatric Nursing*, *39*(3), 115-124. http://www.pediatricnursing.net/ce/2015/article3903115125.pdf

Williams, B., Hoskins, G., Pow, J., Neville, R., Mukhopadhyay, S., & Coyle, J. (2010). Low exercise among children with asthma: A culture of over protection? *British Journal of General Practice*, *60*(577), e319-e326. doi:10.3399/bjgp10X515070

APPENDIX A

Asthma Questionnaire. Venecia and Aguas Zarcas, Costa Rica. March-April, 2014

Cuestionario

1. Los últimos cuatro números de su cédula: _____ (Su identidad será protegida)
2. Nombre de su institución educativa: _____
3. Hombre ☐ Mujer ☐
4. Escoja el rango en que se encuentra su edad.
   a. Menos de 25 años
   b. 25-29 años
   c. 30-39 años
   d. 40-49 años
   e. 50-59 años
   f. 60 años o más
5. ¿Cuál es su grado académico?
   a. Diplomado
   b. Bachillerato
   c. Licenciatura
   d. Maestría
6. Tiempo de servicio en la educación:
   a. 1 año o menos
   b. 2-7 años
   c. 8-13 años
   d. 14-19 años
   e. 20 años o más
7. ¿Es usted asmático/a?
   a. Sí
   b. No
8. ¿Vive en su casa alguien que sea asmático/a?
   a. Sí
   b. No
9. ¿Hay estudiantes asmáticos en su clase?
   a. Sí
   b. No
   c. No sé
10. ¿Ha presenciado usted una crisis asmática en el aula durante su tiempo en la educación?
    a. Sí
    b. No
    c. No recuerdo.
    d. Desconozco que es una crisis asmática.
11. Si contestó sí (opción A) a la pregunta anterior, ¿Qué hizo usted la última vez que presenció una crisis asmática en el aula?
    a. Me asusté y no sabía qué hacer.
    b. Llamé una ambulancia para que llevara al estudiante a una clínica.
    c. Llamé un taxi para que llevara al estudiante a una clínica.
    d. Llamé a los padres del estudiante.
    e. Le administré un inhalador de salbutamol al estudiante.
    f. Otra acción: _____
12. ¿Qué haría usted para prevenir el asma en el aula? **(puede escoger más de una opción)**
    a. Mantener un ambiente limpio y libre de polvo en el aula
    b. Usar una pizarra de tiza
    c. Usar una pizarra acrílica
    d. Eliminar el moho y olores fuertes en el aula
    e. Evitar alfombras y peluches en el aula
    f. Evitar los cambios bruscos de temperatura en el aula
13. Según su experiencia, ¿Qué puede desencadenar una crisis asmática? **(puede escoger más de una opción)**
    a. La gripe
    b. Contaminación del aire (humo, aerosoles, gases)
    c. Aire frío
    d. Alérgenos (como ácaros de polvo, gatos, cucarachas, polen)
    e. Ciertos alimentos
    f. Estrés
    g. Todos los medicamentos

14. ¿Cuáles considera usted que son algunos síntomas de una crisis asmática? **(puede escoger más de una opción)**
    a. Respiración ruidosa
    b. Sed
    c. Tos seca
    d. Respiración rápida
    e. Cara roja
    f. Ansiedad

15. Según su experiencia, ¿Cuáles son algunos medicamentos que se pueden utilizar para tratar el asma? **(puede escoger más de una opción)**
    a. Inhalador Salbutamol
    b. Pastillas Prednisolona
    c. Antibióticos
    d. Analgésico
    e. Jarabe de Salbutamol

16. ¿Le interesaría a usted entender mejor los síntomas y el manejo del asma?
    a. No tengo interés.
    b. Tengo poco interés.
    c. Tengo mucho interés.

17. ¿Tiene usted interés en alguna capacitación para aprender a ayudar a los estudiantes asmáticos?
    a. No tengo interés.
    b. Tengo poco interés.
    c. Tengo mucho interés.

18. ¿Qué tipo de capacitación preferiría recibir usted sobre el asma?
    a. Información escrita
    b. Charlas
    c. Talleres
    d. Un drama educativo

19. ¿Tiene usted otros comentarios que le gustaría compartir? Puede escribir en el otro lado de esta hoja si necesita más espacio.

(Cortar aquí para guardar esta parte)

Muchísimas gracias por participar en este estudio sobre los conocimientos y las actitudes con respecto al asma. Sus respuestas me ayudarán a entender la situación actual del manejo del asma en las escuelas rurales de Costa Rica. Su participación contribuirá a la mejora de la salud pública con respecto al cuidado de niños asmáticos.

Si usted tiene cualquier pregunta de este estudio, o si ha decidido retirar su participación, por favor avíseme. Además, si le gustaría leer mi informe final, avíseme y puedo mandárselo cuando esté listo.

Gracias otra vez.

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