

ORIGINAL ARTICLE

Effectiveness of a modified open airways curriculum

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Abstract

Objective: Open Airways for Schools is an asthma education program that has proven to be effective in decreasing the number of asthma attacks in children and increasing their confidence in self-management. It is taught to 8–11 year olds in six 40-min sessions. Due to financial and scheduling constraints, many schools have difficulty implementing the program. The Tulsa Health Department created a modified version of the program, which is taught in ten 20-min sessions over lunch. The same topics are covered in a different order and fewer activities are utilized. This study aimed to pilot the effectiveness of the modified program. **Methods:** In both versions, a pre-questionnaire is given to participating students on the first day of the program. At the end of the program, the same questionnaire is administered to assess knowledge gained. This is a retrospective review comparing pre- and post-questionnaire data from the two versions of the program. Descriptive statistics and *t*-tests were used to compare the results of the questionnaires from the modified program to results from the original program. **Results:** Twenty students completed the original curriculum and 45 completed the modified program. Both versions were found to improve children's knowledge of how to manage asthma triggers and symptoms, as well as to improve inhaler technique. **Conclusions:** The modified curriculum is effective at increasing asthma knowledge. Schools may use the modified program as an alternate delivery approach to reduce the scheduling burden and to allow more children to benefit from the educational program.

Keywords

Asthma, open airways, patient education, pediatrics, schools, self-management

History

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Introduction

Asthma is a chronic inflammatory disorder of the airways [1] which is influenced by bronchoconstriction, airway hyperresponsiveness and airway edema. This can cause symptoms including shortness of breath, wheezing, coughing and chest tightness. In 2010, asthma affected over 25 million Americans. This includes 7 million (9.4%) children 17 years of age and below [2]. In 2009, approximately 774 000 emergency department (ED) visits were due to an asthma attack in children under 15 years old. In 2009, the average yearly cost of medical care for a child with asthma was \$1039 [4]. These high numbers have implications in education as well; in 2008, asthma accounted for 14.4 million lost days of school [3]. Furthermore, nearly 1 in 2 children with asthma will miss at least 1 day of school each year due to the condition [4].

The Open Airways for Schools program is an asthma education program (developed by the American Lung

Association) based on the educational theory of Jean Piaget – that “children learn best with activities and materials that closely match their developmental capabilities” [5]. The program focuses on children of 8–11 years, who learn best by engaging in hands-on, concrete activities. Thus, group discussion, stories, games, role-play and handouts are utilized in the six 40-min long sessions. Topics covered include (1) the basic information about asthma, (2) recognizing and managing asthma symptoms, (3) using medications and assessing symptoms, (4) avoiding triggers, (5) getting enough exercise and (6) doing well at school. In lesson 2, for example, a role-playing exercise is used in which a girl comes home from school wheezing. Students are assigned different characters (e.g. girl, mom, grandparent and friend) and work together to act out the story. This encourages students to apply knowledge about their own asthma symptoms and what they can do for friends or others when they are experiencing symptoms. Lesson 3 includes demonstration of proper use of asthma medications (using placebos) and peak flow meters. Students are given the opportunity to demonstrate first, before the facilitator does. In lesson 4, posters of a classroom and a home are used to help students identify common triggers in their lives. Each subsequent lesson provides similar activities.

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Studies have shown that there are multiple benefits for children who participate in the Open Airways program including: (1) fewer and less severe asthma attacks, (2) improvement in academic performance and (3) increase in self-confidence and ability to manage their asthma [5,7,9]. Furthermore, educating children with asthma on self-management of their disease may help to improve their self-efficacy. Self-efficacy is an individual's belief about their ability to manage and control situations that affect them [6]. With an increase in self-efficacy, one would expect to also see an increase in adherence with asthma treatment plans, ultimately increasing asthma control and quality of life. This would, in turn, result in a decrease in the corresponding factors such as missed days from school, number of trips to the ED and number of hospitalizations [5], which is beneficial to patients and their families, school systems and the health-care system as a whole.

Based on the studies that have been done, it is justifiable to say that school-based asthma education programs are effective in helping children manage their asthma. However, the burden on schools for teaching and promoting health management is unrealistic [9]. Due to factors such as financial and scheduling constraints, many schools have had difficulty implementing the Open Airways program. If the program is to be taught during the school day, students must be absent from other classes. If the program is to be taught after school, not all students are able to stay. If more options were available to choose from, schools may have an easier time scheduling effective education programs. Therefore, the purpose of this study was to pilot a shorter, condensed Open Airways education program as an alternative, yet still effective, delivery approach compared to the lengthier original program.

Methods

Modified Open Airways curriculum

The Tulsa Health Department created a modified version of the Open Airways curriculum, which included ten 20-min long sessions taught over a 30-min lunch period to accommodate time constraints. The same six topics were covered as in the original program, but in a different order and in a condensed format: (1) the basic information about asthma, (2) avoiding triggers, (3) recognizing and managing asthma symptoms, (4) using medications and assessing symptoms, (5) getting enough exercise and (6) doing well at school. The sequence of topics was reordered to flow in a more logical order for the students. Other modifications included spreading lesson 2 (triggers), lesson 3 (recognizing and managing symptoms) and lesson 4 (using medications and assessing symptoms) over two sessions to provide more focused attention to these self-management principles. The other topics were taught in one session each. Lesson 4 also included demonstration and evaluation of inhaler techniques. A “scoring” rubric was not utilized for assessment. Instead, facilitators had step-by-step instructions on “tasks” the students should complete with device technique. Evaluation was based on facilitator observations. The last session was a review and celebration for the students to complete the program. The same facilitator script from the original

program was used in the modified version. All of the discussion and role-play activities from the original program were included, with the exception of “Sharing Feelings about Asthma” in the first session and “How I Feel about Myself” in the last session. These sessions were omitted due to the limited time of the sessions. These topics involve more participation and discussion; therefore, it was decided that the 20-min time would not be conducive to facilitating these discussions. The students were provided with all the same handouts as the original program.

Delivery of curriculum

The American Lung Association (ALA) delivered the original Open Airways program in a Tulsa-area elementary school in Spring 2012 over 6 weeks and had 20 students participate and complete the curriculum. The modified Open Airways curriculum was delivered in Spring 2013 over 10 weeks to four different Tulsa-area elementary schools that agreed to participate in the program. All five schools that participated were similar in social demographics and were geographically located in areas with limited incomes. The overall school sizes varied from 400 to 700 students. With both delivery formats, information letters explaining the program were sent home to parents of third, fourth and fifth grade students diagnosed with asthma. Children were allowed to participate if consent was obtained from the child's caregiver.

Prior to delivering the curriculum, the volunteer facilitators viewed a standardized Open Airways training webinar, which included basic information about asthma, proper inhaler technique, how to use and follow the provided Open Airways curriculum book, how to best engage the children and how to handle problems that may arise. After viewing the webinar, they received live training from representatives from ALA and the Tulsa Health Department. The volunteers were split into pairs, with each pair designated to go to a different elementary school. They went to the schools weekly once for 10 weeks, with the exception of 1 week at one of the participating schools. Due to an unexpected scheduling conflict, lessons 5 and 6 were combined to compensate for this missed week.

The Open Airways curriculum (both original and modified) included a pre-program questionnaire given to students at the beginning of the first session (Appendix). Students were not given a time limit, but took an average of 5–10 min to complete the questionnaire. Students were told that there were no right or wrong answers and to answer the best they could. The questionnaire was designed to assess baseline asthma knowledge and perceptions prior to the program. At the end of the program, the same questionnaire was given to students to assess knowledge gained and efficacy of the program. The completed questionnaires were provided by ALA and the Tulsa Health Department, and were immediately de-identified upon receipt by the investigators.

Statistical analysis

Descriptive statistics were used to compare the results of the pre- and post-questionnaires from the modified program to results from the original program. Paired *t*-tests were used to

Table 1. Demographics of program participants.

	Original – Spring 2012 (%) (n = 20)	Modified – Spring 2013 (%) (n = 45)	Total (%) (n = 65)
Gender			
Boys	70	49	55
Girls	30	44	40
Blank	–	6.7	4.6
Age			
8	5	15.6	12.3
9	20	24.4	23.1
10	45	37.8	40
11	25	17.8	20
12	–	2.2	1.5
Blank	5	2.2	3.1

compare percentage improvements in pre–post questions with the original program and modified program.

Results

Forty-five students, ranging in age from 8 to 12 years, participated and completed the modified curriculum (Table 1). There was one student who started the program but did not complete it. There were 22 boys (49%) and 20 girls (44%) that participated. Combining the original program delivery (Spring 2012) and modified delivery (Spring 2013), the majority of participants were boys ($n=36$, 55%) and 10 years old (40%). Each of the four schools had anywhere from 4 to 13 students participating.

Noteworthy or clinically relevant items of comparison from the questionnaire include questions 1, 4, 7–10 and 11. Question 1 asks “Do you take medicine to stop your asthma symptoms?” Students can answer “No”, “Sometimes” or “Yes” (Table 2). In the original program, only 10% of students answered “yes” on the pre-test, while 40% answered “yes” on the post-test. In the modified program, 24.4% of students answered “yes” on the pre-test, while 42.2% answered “yes” on the post-test. In the original program, 75% of students answered “sometimes” on the pre-test, while only 35% answered “sometimes” on the post-test. In the modified program, 64.4% of students answered “sometimes” on the pre-test, while 44.4% answered “sometimes” on the post-test.

Question 4 asks “Do you try to get away from your asthma triggers?” Again, students can answer “No”, “Sometimes” or “Yes” (Table 2). In the original program, 20% of students answered “no” on the pre-test while 25% of students answered “no” on the post-test. In the modified program, 27% of students answered “no” on the pre-test, while 0% of students answered “no” on the post-test.

Questions 7–10 are scenarios under a main question: “What signs mean you should call the doctor or go to the emergency room?” For each scenario (questions 7–10), participants select either “No, don’t go to the doctor” or “Yes, go to the doctor”. Percentages of incorrect and correct answers chosen for each scenario are shown in Table 3. Looking at the average number of incorrect answers chosen in the original program, there was a 55% increase from pre- to post-test. In the modified program, there was a 6.25% increase in this same category.

Table 2. Breakdown of how students answered questions 1–6 on the questionnaire.

Think about when you have asthma symptoms.				
	Old Pre ^a (%)	Old Post ^b (%)	New Pre ^c (%)	New Post ^d (%)
Q.1: Do you take medicine to stop your asthma symptoms?				
No	15	20	11.1	6.7
Sometimes	75	35	64.4	44.4
Yes	10	40	24.4	42.2
Blank	–	5	–	6.7
Q.2: Do you try to relax and stay calm?				
No	10	10	15.6	6.7
Sometimes	55	70	55.6	44.4
Yes	35	20	28.9	44.4
Blank	–	–	–	4.4
Q.3: Do you do belly breathing to relax?				
No	50	40	55.6	57.8
Sometimes	40	50	35.6	37.8
Yes	10	10	6.7	2.2
Blank	–	–	2.2	2.2
Q.4: Do you try to get away from your asthma triggers?				
No	20	25	26.7	–
Sometimes	30	30	42.2	33.3
Yes	45	45	31.1	64.4
Blank	5	–	–	2.2
Q.5: Do you watch to see if your symptoms get better or worse?				
No	10	15	24.4	15.6
Sometimes	70	50	42.2	40
Yes	20	35	33.3	42.2
Blank	–	–	–	2.2
Q.6: Do you tell an adult when you are having symptoms?				
No	15	10	11.1	4.4
Sometimes	40	45	33.3	26.7
Yes	45	45	55.6	66.7
Blank	–	–	–	2.2

^aPre-test results from original curriculum.

^bPost-test results from original curriculum.

^cPre-test results from modified curriculum.

^dPost-test results from modified curriculum.

Table 3. Breakdown of how students answered questions 7–10 on the questionnaire.

What signs mean you should call the doctor or go to the emergency room?				
	Old Pre ^a (%)	Old Post ^b (%)	New Pre ^c (%)	New Post ^d (%)
Q.7: Your wheezing or coughing gets worse after you take medicine				
Wrong answer chosen	10	20	11.1	30
Correct answer chosen	90	80	88.9	70
Q.: You rested and your asthma symptoms are gone.				
Wrong answer chosen	25	30	8.9	15
Correct answer chosen	75	70	91.1	85
Q.9: You have mild wheezing and you can play.				
Wrong answer chosen	45	55	6.7	25
Correct answer chosen	55	45	93.3	75
Q.10: You are having a hard time walking, talking or playing.				
Wrong answer chosen	20	50	8.9	15
Correct answer chosen	80	50	91.1	85

^aPre-test results from original curriculum.

^bPost-test results from original curriculum.

^cPre-test results from modified curriculum.

^dPost-test results from modified curriculum.

Question 11 lists a number of triggers (e.g. pollen, dust and emotions) and asks participants to circle the things that could trigger an asthma attack. In the original program, there was an average percent increase of 35.35% in number of correct triggers chosen between pre- and post-test. Using a paired *t*-test, this increase proved to be significant with a level of $\alpha=0.01$. In the modified program, there was an average percent increase of 88.96% in number of correct triggers chosen between pre- and post-test. Using a paired *t*-test, this increase proved to be significant with a level of $\alpha=0.001$.

While subjective, the facilitators agreed that the students' device techniques improved after receiving education on proper technique.

Discussion

Overall, this pilot saw an increase in children's knowledge of how to manage asthma triggers and symptoms, as well as an improvement in inhaler technique, after participating in a modified Open Airways program. In other words, the outcomes observed improved in the modified curriculum, just as they did in the original curriculum.

Question 1 asks about taking asthma medicine when having symptoms. While this may seem like an obvious thing to do, it was observed that some education about asthma improved students' knowledge on this step. Not all students answered "yes" to this question. Possible explanations could be they do not understand the medicine they are taking and how it works, they do not have any asthma medicine, or they misunderstood the question. Alternately, for the students who answered "sometimes", it is possible they are able to manage their symptoms by other methods such as relaxing and breathing. In both the original and modified programs, there was a decrease in answering "sometimes" from pre- to post-test, and an increase in answering "yes" from pre- to post-test.

Question 4 asks about getting away from asthma triggers. In the modified program, a number of students (27%) said "no" on the pre-test, but zero students said "no" on the post-test. After receiving education, students were more likely to say they do try to get away from triggers. In the original program, there was a slight increase from pre- to post-test in the number of students who said "no" (20% pre, 25% post).

The results are less clear in questions 7–10, which focused on signs of when to see a doctor. Students participating in both curriculums answered more questions incorrectly on the post-test than on the pre-test (55% increase in original program, 6.25% increase in modified program). This raises the question of whether this part of the Open Airways curriculum was not explained clearly by the program content or facilitator or if students misunderstood the question. Gerald et al. [9] used a condensed version of the Open Airways curriculum but only report the improvements in pre- and post-test scores as a whole versus by each individual question. Since this observation was seen in both curriculums, it does not a factor in when looking at the effectiveness of the modified curriculum compared to the original.

Selecting asthma triggers in Question 11 also showed improvement from pre- to post-test in both the original and modified programs. Receiving education clearly benefited the students in this area. Furthermore, the average percent increase

in the modified program (88.96%) showed to be higher than the original program (35.35%). This gives support for the modified program being just as effective as the original program with increasing knowledge of asthma triggers.

In 2011, Ahmad and Grimes [7] evaluated nine studies on asthma education programs conducted in schools between 1998 and 2009. The programs each involved multiple short sessions, lasting from a month to a month and a half. Half of these programs were variations of the Open Airways curriculum for children of 8–11 years, similar to the modified curriculum created by the Tulsa Health Department. Other programs were similar to Open Airways in content and one included website-based education instead of live education. Within 1 year of completion of the programs, the studies measured the impact on number of school days missed, ED visits and/or hospitalizations. To do this, most studies used pre- and post-questionnaires given to students and/or parents, asking about number of school days missed, ED visits and/or hospitalizations as the method of evaluation. Alternatively, a few studies collected data from school records (number of days missed) and hospital chart reviews (number of ED visits). All nine studies reported a decrease in number of missed school days, and six of the studies found the decrease to be statistically significant ($p<0.05$). A number of studies, four out of eight, found a statistically significant decrease ($p<0.05$) in the number of ED visits. Only two studies found a statistically significant decrease ($p<0.01$) in the number of asthma-related hospitalizations, but this variable was not measured in every study. Although this study focused on a different outcome variable, asthma knowledge, it still focused on the use of Open Airways programs. Given the data from the studies evaluated, increasing knowledge of asthma and what triggers it through school-based asthma education programs will most likely lead to a decrease in missed school days, ED visits and hospitalizations.

Zivkovic et al. [8] evaluated the effectiveness of children attending Asthma School (an educational intervention designed to produce acceptable asthma knowledge and to improve treatment) with their parents. Asthma School consisted of two half-day sessions, which included lectures, audiovisual (AV) presentations, discussions, clinical evaluations and face-to-face interviews. Children and parents receiving this intervention were compared to the non-intervention group, who received basic education about their asthma therapy, instruction on inhaler use and a printed handbook called *Meet Your Asthma*. Twelve months after the end of the intervention program, improvements were seen in asthma knowledge. Receiving asthma education through formats such as lectures, AV presentations and discussions (the intervention) showed statistically significant improvement in asthma knowledge (before 63%, after 82%, $p<0.05$). Receiving education in the format of a handbook (non-intervention) did not significantly improve asthma knowledge. Other categories were assessed and also showed improvement: compliance (70% before, 90% after, $p<0.05$) and inhaler technique (20% before, 70% after, $p<0.05$). All of these categories are necessary components to lowering asthma statistics. Similar to Zivkovic et al., this study showed an increase in asthma knowledge after using interactive educational formats such as discussion.

Gerald et al. [9] evaluated an Open Airways program implemented in an inner-city school system (13 schools). Using a pre- and post-test with fourth graders who participated in the program, they found a statistically significant increase ($p < 0.0001$) in asthma knowledge, with an average increase of 0.66 points from the pre-test to the post-test in all 13 schools. However, the school system had time constraints, which led to the length of the Open Airways sessions being shortened. The researchers did not feel that shortening the sessions limited the impact, but felt that “altering tested interventions could impact their effectiveness”. The sequence of topics presented has the potential to impact understanding of subsequent topics. Our study also evaluated a condensed curriculum, but found it was just as effective in improving children’s knowledge of how to manage asthma triggers and symptoms as the lengthier version.

This pilot has also revealed some global findings regarding the curriculum structure. The modified curriculum saw an increase in correct answers in the lessons that were delivered over two sessions: (1) avoiding triggers and (2) recognizing and managing symptoms. This highlights that the expansion of these topics as a potential modification when designing and implementing either the modified or original curriculum. However, the third lesson which was also taught over two sessions, covering the topic “using medications and assessing symptoms”, saw a decrease in the number of correctly answered questions on the post-test (both original and modified curriculum) specifically on signs of when to see a doctor (questions 7–10). Further research into the structure of the program content, the facilitation of this section or changing the evaluation method is warranted.

Limitations

The modified Open Airways curriculum was designed with the intent of reducing the scheduling burden for schools. While the program did demonstrate an improvement in knowledge, there were some logistical limitations that could have impacted the increase in knowledge obtained with the modified program. The program was taught to students during their lunch periods, so they had to get their food from the cafeteria, if needed, and eat during lessons. The school nurses created Open Airways lunch passes to allow students to go to the front of the line, which helped with timing. However, timing was a challenge with some students; either they were more interested in eating lunch or they were very interested in participating in the program and forgot to simultaneously eat lunch. This did seem to improve after a few weeks, once students understood the schedule. This still, however, took time away from the allotted 20-min session.

Some students did not receive the full weekly lesson. The fifth graders at one school had a field trip the day of an Open Airways lesson, so the missed lesson was combined with the next lesson the following week to stay within the 10-week schedule. In addition, there were students who were absent from school on the day of an Open Airways lesson. This information was not collected; however, all students completed the pre- and post-tests. Instructors provided the students that missed a lesson the handouts from the missed

week, but did not have time to review the material with them since only 20 min were allotted each week.

The pre- and post-tests were designed to immediately assess the efficacy of the education program and for learners to assess the knowledge they obtained. The test results, knowledge gained, does not have any implications on long-term knowledge retained or impact on asthma control. It would be interesting to conduct a longer duration study that assessed the immediate knowledge as well as knowledge retained in a year or several years. Despite having steps to follow and ensure students are completing with device techniques, a lack of scoring rubric opens the possibility of observation bias. Future studies should incorporate scoring rubrics to help ensure each “step” is completed and to show improvement in the number of steps completed pre- and post-education.

In addition, the curriculum was taught by different volunteer facilitators at each school. Even though they all received the same training, some may have been more effective at delivering the program or interacting with students than others. Thus, there may be an information bias present in the study.

There were only 45 students who participated in this pilot. A larger sample size would help solidify areas of statistical significance and, as discussed, areas for possible improvement in the curriculum.

Conclusions

Both the original and modified versions of Open Airways were found to improve children’s knowledge of how to manage asthma triggers and symptoms, as well as to improve inhaler technique. Thus, it can be concluded that the modified curriculum, taught in 20-min sessions, is just as effective at increasing asthma knowledge as the original curriculum. This implies that schools may use the modified program as an alternate delivery approach to reduce the scheduling burden and to allow more children to benefit from the educational program. A larger study with more participants, a longer follow-up period, and the addition of variables such as emergency department visits or missed school days would further validate the effectiveness of the modified program.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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Appendix

Open Airways For Schools: Pre-Program Questionnaire

NAME: _____ SCHOOL: _____ DATE: _____

Below are questions about yourself. Please either write in your answer neatly, or fill in the circle that best describes you.

What grade are you in? ☐ 3rd ☐ 4th ☐ 5th ☐ 6th

How old are you? ☐ 8 ☐ 9 ☐ 10 ☐ 11

Are you a boy or a girl? ☐ Boy ☐ Girl

Have you ever been in an Open Airways For Schools class before? ☐ No ☐ Yes

Think about when you have asthma symptoms.

1. Do you take medicine to stop your asthma symptoms?

☐ No ☐ Sometimes ☐ All the time

2. Do you try to relax and stay calm?

☐ No ☐ Sometimes ☐ All the time

3. Do you do belly breathing to relax?

☐ No ☐ Sometimes ☐ All the time

4. Do you try to get away from your asthma triggers?

☐ No ☐ Sometimes ☐ All the time

5. Do you watch to see if your symptoms get better or worse?

☐ No ☐ Sometimes ☐ All the time

6. Do you tell an adult when you are having symptoms?

☐ No ☐ Sometimes ☐ All the time

Open Airways For Schools: Pre-Program Questionnaire

What signs mean you should call the doctor or go to the emergency room?

7. **Your wheezing or coughing gets worse after you take medicine.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.
8. **You rested and your asthma symptoms are gone.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.
9. **You have mild wheezing and you can play.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.
10. **You are having a hard time walking, talking, or playing.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.

From the list below, circle the things that bring on your asthma. Also circle the things that can bring on asthma in other people with asthma.

Pets like dogs, cats, rabbits

Strong smells like perfume,
hairspray, and cleaning products

Mold

Smoke

Pollen

Cuts

Changes in weather

Having a cold

Touching dirty things

Vitamin pills

Cockroaches

Very cold air

Physical activity like running,
swimming, or playing

Strong feelings like laughing or crying

Open Airways For Schools: Post-Program Questionnaire

NAME: _____ SCHOOL: _____ DATE: _____

Below are questions about yourself. Please either write in your answer neatly, or fill in the circle that best describes you.

What grade are you in? ☐ 3rd ☐ 4th ☐ 5th ☐ 6thHow old are you? ☐ 8 ☐ 9 ☐ 10 ☐ 11Are you a boy or a girl? ☐ Boy ☐ GirlHave you ever been in an Open Airways For Schools class before? ☐ No ☐ Yes

Think about when you have asthma symptoms.

1. Do you take medicine to stop your asthma symptoms?

☐ No ☐ Sometimes ☐ All the time

2. Do you try to relax and stay calm?

☐ No ☐ Sometimes ☐ All the time

3. Do you do belly breathing to relax?

☐ No ☐ Sometimes ☐ All the time

4. Do you try to get away from your asthma triggers?

☐ No ☐ Sometimes ☐ All the time

5. Do you watch to see if your symptoms get better or worse?

☐ No ☐ Sometimes ☐ All the time

6. Do you tell an adult when you are having symptoms?

☐ No ☐ Sometimes ☐ All the time

Open Airways For Schools: Post-Program Questionnaire

What signs mean you should call the doctor or go to the emergency room?

7. **Your wheezing or coughing gets worse after you take medicine.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.
8. **You rested and your asthma symptoms are gone.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.
9. **You have mild wheezing and you can play.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.
10. **You are having a hard time walking, talking, or playing.**
☐ No, don't go to the doctor. ☐ Yes, go to the doctor.

From the list below, circle the things that bring on your asthma. Also circle the things that can bring on asthma in other people with asthma.

Pets like dogs, cats, rabbits

Strong smells like perfume,
hairspray, and cleaning products

Mold

Smoke

Pollen

Cuts

Changes in weather

Having a cold

Touching dirty things

Vitamin pills

Cockroaches

Very cold air

Physical activity like running,
swimming, or playing

Strong feelings like laughing or crying