

Asthma Knowledge Level of Primary Schoolteachers in Istanbul, Turkey

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SUMMARY The purpose of this study was to elucidate the asthma knowledge level of primary school teachers in Istanbul, and factors associated with this subject. Seven hundred and ninety-two teachers from 73 randomly selected primary schools in Istanbul were included in this study. Although Istanbul primary school teachers generally have a satisfactory knowledge on asthma, they lack knowledge on triggers of asthma attacks and on the management of the disease. The knowledge level of the teachers was related to gender but was not related to age, education level, length of tenure, location of primary school and county. We think that an asthma education program is needed for Turkish teachers to increase their understanding about what asthma is, its impact and how to meet the needs of a child with asthma to achieve improved wellbeing and school attendance.

Asthma is the most common chronic disease of childhood. The prevalence of childhood asthma in Turkey ranges between 2.8% and 17.4%.¹⁻⁶ The prevalence of asthma in Istanbul, the biggest city in Turkey with more than 10 million inhabitants, diagnosed by a physician is 9.8%.¹ Asthma is one of the main reasons for school absenteeism and reduced participation in school activities and games.⁷⁻¹⁰

Coordination among parents, physicians, and school personnel can encourage the child to participate eagerly in school activities. The primary responsibility for supervising schoolchildren with asthma during school hours^{11,12} and making decisions regarding physical activities and both emergency and regular drug treatment¹³ belongs to teachers.

Esquibel *et al.*¹⁴ described parents' anxiety about teacher's knowledge and ability to recognize early warning signs of an asthma attack and to take appropriate action. Colver¹⁵ has shown that a community asthma campaign based on collaboration be-

tween school health services and general practitioners can improve diagnosis and treatment of asthma and relieve parental anxiety. Studies performed on school teachers have shown that they had only limited understanding of asthma, particularly regarding exercise and its management; and they were aware of this deficit and keen to learn more about this subject.^{13,16,17} Few school teachers, however, currently receive instruction about asthma or how to manage asthmatic children.¹⁸ Henry *et al.*¹⁹ showed that a 2-hour seminar can be effective for improving asthma knowledge of the school staff.

The purpose of this study was to elucidate the level of knowledge about asthma among teachers, and factors associated with knowledge about asthma among primary school teachers. This is the

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first study carried out on Turkish teachers.

MATERIALS AND METHODS

This study was performed on 792 teachers from 73 randomly selected primary schools from 32 areas in Istanbul between May and June 2004. The teachers' level of knowledge about asthma was assessed by a questionnaire with 26 questions about triggers of asthma, symptoms and signs of asthma,

treatments for asthma and general knowledge about asthma (Table 1). The teachers were asked six additional questions about demographic and other characteristics of the primary schools and about themselves (Table 2).

The response to each of the 26 questions was measured on a 5-point Likert scale (e.g., 1, strongly disagree; 2, disagree; 3, not sure; 4, agree; and 5, strongly agree), which was adapted and formulated

Table 1 Questionnaire for asthma knowledge

	Disagree completely	Disagree somewhat	Not sure	Agree somewhat	Agree completely
Common asthma symptoms or signs include:					
Shortness of breathing	1	2	3	4	5
Diarrhea	5	4	3	2	1
Coughing	1	2	3	4	5
Sneezing	5	4	3	2	1
Fever	5	4	3	2	1
Sore throat	5	4	3	2	1
Wheezing	1	2	3	4	5
Common asthma triggers include:					
Exercise	1	2	3	4	5
Aspirin	1	2	3	4	5
Emotional upset	1	2	3	4	5
Cool air	1	2	3	4	5
Laughing	1	2	3	4	5
Pets (e.g. dogs, cats)	1	2	3	4	5
Kissing another child with asthma	5	4	3	2	1
Common asthma treatments include:					
Physical therapy	5	4	3	2	1
Oxygen	1	2	3	4	5
Drugs opening the airway (e.g. salbutamol, terbutaline)	1	2	3	4	5
Antitussive drugs	5	4	3	2	1
General questions about asthma:					
Is asthma a contagious disease?	5	4	3	2	1
Is asthma a hereditary disease?	1	2	3	4	5
Is asthma curable?	1	2	3	4	5
Is there a relation between asthma and allergy?	1	2	3	4	5
Can an asthmatic child do sports?	1	2	3	4	5
Does smoking worsen asthma?	1	2	3	4	5
Do infections (virus and bacteria) cause allergy?	5	4	3	2	1
Do moulds and cockroaches cause allergy?	1	2	3	4	5

Table 2 Characteristics of primary schools and asthma knowledge scores of their teachers

Characteristics	Proportion (%)	Asthma knowledge (mean $\pm$ SD)	<i>p</i> value
Gender			
Male	329 (41.5)	94.28 $\pm$ 7.35	0.003
Female	463 (58.5)	98.54 $\pm$ 25.09	
Education level			
University	605 (76.4)	97.48 $\pm$ 22.27	0.07
High school, college	187 (23.6)	94.47 $\pm$ 7.74	
Tenure (years)			
< 1	37 (4.7)	96.05 $\pm$ 7.44	0.76
1 - 5	183 (23.1)	96.01 $\pm$ 6.6	
6 - 10	178 (22.5)	98.10 $\pm$ 7.01	
> 10	394 (49.7)	96.59 $\pm$ 27.30	
Age (years)			
< 30	189 (23.9)	96.73 $\pm$ 6.57	0.13
30 - 50	529 (66.8)	97.38 $\pm$ 23.73	
> 50	74 (9.3)	92.45 $\pm$ 8.31	
Location of primary school			
Urban	228 (28.8)	95.76 $\pm$ 7.36	0.60
Suburban	254 (32.1)	96.78 $\pm$ 8.0	
Rural	310 (39.1)	97.50 $\pm$ 30.27	
Location of county			
Urban	285 (36.0)	95.58 $\pm$ 7.30	0.36
Suburban	278 (35.1)	96.90 $\pm$ 7.86	
Rural	229 (28.9)	98.09 $\pm$ 34.99	

from the Knowledge, Attitude, and Self-Efficacy Asthma Questionnaire (KASE-AQ).²⁰ The teachers' responses were scored and added up in discrete values from 0 to 130 based on their knowledge and confidence about their responses and were subsequently converted to the percentage of responses that agreed with the expected answer. In addition, the response rate for each question about asthma was evaluated from a maximum of 5 marks (Tables 3 and 4). A true response was accepted as 5 points.

One-way ANOVA and the independent samples t-test were used to determine differences in the level of asthma knowledge.

RESULTS

A total of 792 teachers (453 Females/319 Males) filled in the questionnaire. The mean age of the teachers was 38 ± 9 years (range, 21–61 years) with a mean tenure of 14 ± 10 years. The mean total

asthma knowledge score for the 26 questions was 96.7 ± 19.8 (74.3%) from a maximum of 130 marks. The teachers' response score and rate of true response to each question concerning asthma are given in Tables 3 and 4. The rate of mean scores of teachers' knowledge ranged from 38% to 94%. The rate of true responders to each question ranged from 3.7% to 84.2%. Seventy-one percent of the teachers responded positively that shortness of breathing was a common asthma symptom. However, this rate was 49.7% and 28.5% for wheezing and coughing, respectively. In addition, teachers scored badly for questions related to other symptoms or signs (Table 4). The rates of true responders about oxygen, drugs opening the airway and antitussive drugs for asthma treatment were 56.4%, 68.9% and 12.5%, respectively. True responders to each question are given in Table 4.

The asthma knowledge level was not related to teachers' age, education level, length of tenure,

Table 3 Teachers' knowledge about asthma

Questions	Mean score	%
What are common symptoms or signs of asthma?		
Shortness of breathing	4.6	92
Diarrhea	4.1	82
Coughing	3.9	78
Sneezing	2.7	54
Fever	3.0	60
Sore throat	2.8	56
Wheezing	4.3	86
What are common triggers of asthma?		
Exercise	2.8	56
Aspirin	2.4	48
Emotional upset	4.2	84
Cool air	3.8	76
Laughing	2.3	46
Pets (e.g. dogs, cats)	3.9	78
Kissing another child with asthma	4.2	84
What are common treatments for asthma?		
Physical therapy	3.8	76
Oxygen	4.4	88
Drugs opening the airway (e.g. ventolin, bricanyl)	4.6	92
Antitussive drugs	2.8	56
General questions about asthma		
Is asthma a contagious disease?	4.6	92
Is asthma a hereditary disease?	3.6	72
Is asthma curable?	4.3	86
Is there a relation between asthma and allergy?	4.1	82
Can an asthmatic child do sports?	3.7	74
Does smoking worsen asthma?	4.7	94
Do infections (virus and bacteria) cause allergy?	1.9	38
Do moulds and cockroaches cause allergy?	4.0	80

location of primary school and county ($p = 0.07$, $p = 0.76$, $p = 0.289$, $p = 0.60$, $p = 0.36$, respectively). Gender was a factor, however ($p = 0.003$).

DISCUSSION

School is the child's home away from home and is one of the most important environments to safeguard. In general, it is reported that teachers have limited knowledge and understanding of asthma.^{13,17,21,22} In our study, the mean asthma knowledge score was 96.7 ± 19.8 (74.3%) showing that Istanbul primary school teachers generally have satisfactory knowledge on the signs, symptoms and

treatment of asthma, and the nature of the disease, but they were not good at subjects like the role of exercise, aspirin and antitussive drug usage in asthma. Teachers knew that shortness of breath, wheezing and coughing are a symptom or sign of asthma with true response rates of 71%, 49.7%, 28.5%, respectively (Table 4). Hussey *et al.*²³ reported that teachers' knowledge on signs, symptoms and provoking factors of asthma and the nature of the disease were generally satisfactory, but they found their knowledge on asthma medications, treatment and management of asthma to be poor. They found that teachers' knowledge on signs and symptoms of asthma was good with a mean of 6.14

Table 4 Teachers' knowledge about asthma

	Disagree completely N (%)	Disagree somewhat N (%)	Not sure N (%)	Agree somewhat N (%)	Agree completely N (%)
Common asthma symptoms or signs include:					
Shortness of breathing	7 (0.9)	12 (1.5)	18 (2.3)	192 (24.2)	563 (71)
Diarrhea	433 (54.7)	105 (13.3)	216 (27.3)	30 (3.8)	8 (1.0)
Coughing	18 (2.3)	36 (4.5)	115 (14.5)	397 (50.1)	226 (28.5)
Sneezing	132 (16.7)	255 (32.2)	215 (27.1)	91 (11.5)	99 (12.5)
Fever	53 (6.7)	213 (26.9)	277 (35)	132 (16.7)	117 (14.8)
Sore throat	72 (9.1)	262 (33.1)	251 (31.7)	117 (14.8)	90 (11.4)
Wheezing	13 (1.6)	9 (1.1)	72 (9.1)	304 (38.4)	394 (49.7)
Common asthma triggers include:					
Exercise	176 (22.2)	104 (13.1)	232 (29.3)	218 (27.5)	62 (7.8)
Aspirin	25 (3.2)	55 (6.9)	377 (47.6)	131 (16.5)	204 (25.8)
Emotional upset	54 (6.8)	43 (5.4)	182 (23)	357 (45.1)	156 (19.7)
Cool air	30 (3.8)	45 (5.7)	150 (18.9)	342 (43.2)	225 (28.4)
Laughing	298 (37.6)	94 (11.9)	253 (31.9)	118 (14.9)	29 (3.7)
Pets (e.g. dogs, cats)	34 (4.3)	30 (3.8)	151 (19.1)	301 (38)	276 (34.8)
Kissing another child with asthma	8 (1.0)	47 (5.9)	179 (22.6)	84 (10.6)	474 (59.8)
Common asthma treatments include:					
Physical therapy	14 (1.8)	65 (8.2)	288 (36.4)	68 (8.6)	357 (45.1)
Oxygen	6 (0.8)	9 (1.1)	84 (10.6)	246 (31.1)	447 (56.4)
Drugs opening the airway (e.g. salbutamol, terbutaline)	9 (1.1)	2 (0.3)	38 (4.8)	197 (24.9)	546 (68.9)
Antitussive drugs	75 (9.5)	273 (34.5)	255 (32.2)	90 (11.4)	99 (12.5)
General questions about asthma:					
Is asthma a contagious disease?	18 (2.3)	20 (2.5)	56 (7.1)	44 (5.6)	654 (82.6)
Is asthma a hereditary disease?	92 (11.6)	61 (7.7)	113 (14.3)	330 (41.7)	196 (24.7)
Is asthma curable?	16 (2.0)	17 (2.1)	84 (10.6)	265 (33.5)	410 (51.8)
Is there a relation between asthma and allergy?	26 (3.3)	27 (3.4)	75 (9.5)	300 (37.9)	364 (46)
Can an asthmatic child do sports?	50 (6.3)	48 (6.1)	163 (20.6)	359 (45.3)	171 (21.6)
Does smoking worsen asthma?	9 (1.1)	1 (0.1)	28 (3.5)	87 (11)	667 (84.2)
Do infections (virus and bacteria) cause allergy?	323 (40.8)	285 (36)	123 (15.5)	30 (3.8)	31 (3.9)
Do moulds and cockroaches cause allergy?	14 (1.8)	29 (3.7)	133 (16.8)	309 (39)	307 (38.8)

from a maximum of 9 marks (68%) and 5.74 from a maximum of 8 marks (72%). In another study performed by Brookes and Jones,¹⁶ 68% of schoolteachers knew that "breathlessness" is a symptom of asthma.

It is particularly important that teachers are knowledgeable about the factors that provoke asthma so that they can identify stimuli that may trigger an attack in the school environment.²³ However, we found that teachers had particularly limited under-

standing of the common triggers of asthma. In our study, teachers knew that aspirin, laughing and exercise are provoking factors with a true response rate of 25.8%, 3.7%, 7.8%, respectively. The knowledge score rate for the question concerning cold wind as a provoking factor was found to be 76%, whereas Bevis-Taylor¹³ and Hussey *et al.*¹⁶ reported a rate of true responders for this question at 27% and 37%, respectively. In our study, the rate of true responders for the question about asthma triggers was found to be 28.4% for cool air. The rate of true responders

for the influence of emotional factors on asthma was found to be 19.7%, whereas Madsen *et al.*²¹ and Bevis-Taylor¹³ reported a true response rate about this subject as 72% and 84%, respectively.

Teachers are responsible for supervising asthma medications at school. In our study, the rate of completely true responders for salbutamol and terbutaline as quick-relief medications for acute symptoms was found to be 68.9%. Madsen *et al.*²¹ reported that 56.3% of teachers knew how to use quick-relief asthma medications. This rate was found to be 60% by Bevis and Taylor.¹³ In our study, we focused on the usage of antitussive drugs in asthma. We found that the majority of teachers had little knowledge about the use of antitussive drugs in the treatment of asthma. Appropriate knowledge about this subject may direct the teacher to observe an asthmatic child who is unresponsive to antitussive agents and thus warn the family.

Physical activity provides the same beneficial advantages for asthmatic children and the others, physically and psychologically.²³ The asthmatic child may be reluctant to take part in physical activities in school due to fear of new attacks and lack of performance during sports. The teacher may be the one who decides whether an asthmatic child can participate in physical activities or not. In our study, teachers knew that asthmatic children can participate in sports with a true responders rate of 21.6%. Madsen *et al.*²¹ reported that 80.4% of teachers had the correct opinion that asthmatic children should be encouraged to take an active part in sports. Hussey *et al.*²³ reported that although 80% of teachers were conscious of asthma having an exercise-induced component, few teachers made suitable preparations for this situation before physical activity. Another study performed by Menardo-Mazeran *et al.*²⁴ also demonstrated that although 82% of teachers knew about the existence of exercise-induced asthma, they lacked the knowledge for its management.

There is little information about the factors associated with teachers' knowledge on asthma in the literature. Juhn *et al.*²⁵ showed that although gender, education level, and age did not affect asthma knowledge, the level of child care program directors and shorter tenure had an influence in favor of the knowledge level. In our study, the asthma knowledge

level was not related to teachers' age, education level and length of tenure periods, location of primary school and county. Our study identified female gender as a factor associated with higher asthma knowledge level than male gender ($p = 0.003$). There is no literature available on the relationship between gender and asthma knowledge level. This may be due to the fact that there are more female teachers involved with children's healthcare than males.

Although many asthma education programs have had mixed results,²⁶ asthma education can provide better outcome in the management of asthma and can be cost-effective.^{27,28} Hill and Tattersfield^{12,17} reported that collaboration among teachers and the school health service and educational programs for teachers can improve the management of asthmatic children. Studies performed in educational programs for teachers have shown that teachers were willing to attend the teacher training courses for asthma.^{11,29}

In conclusion, we think that an educational program for asthma is needed for Turkish teachers to increase their understanding about what asthma is, its impact and how to meet the needs of a child with asthma to achieve improved wellbeing and school attendance.

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