

Childhood asthma knowledge among first year nursing students in three european cities

L. García-Marcos^a, Z. Mughal^b, E. Korsch^c, A. Martínez Torres^d, J. Abbott^e, G. Lyte^e and M. Klüser^c

^aDepartment of Pediatrics. Murcia School of Medicine and Pediatric Research Unit. Cartagena. Spain.

^bDepartment of Pediatrics. St Mary's Hospital. Manchester, UK. ^cKinderkrankenhaus der Stadt, Köln, Germany.

^dRegional Health Authority. Area II and Pediatric Research Unit. Cartagena, Spain. ^eUniversity of Manchester School of Nursing, UK.

ABSTRACT

Background: There are no available studies that assess and compare knowledge of childhood asthma among subjects living in different European countries. The objective of this study was to determine knowledge of childhood asthma among first year nursing students during the first week of their training in three European countries. The participants' sources of information and other factors that might influence their asthma knowledge score (AKS) were also evaluated.

Methods: Cross-sectional design using a modified version of a previously validated questionnaire. The study was undertaken in 261 students in Cartagena (Spain), 202 in Manchester (UK) and 94 in Cologne (Germany).

Results: AKS (maximum score, 27) was significantly higher in students from Manchester (18.3 \pm 2.6) than in those from Cartagena (15.9 \pm 3.1) and

Cologne (15.1 \pm 3.6). In all three cities, more than 70 % of the students answered 10 out of the 27 questions correctly. Knowledge of asthma relievers or preventers was very limited. AKS showed a positive but marginal correlation with student age ($r = 0.11$, $p = 0.07$). Only knowledge gained from personal experience was significantly associated ($r = 0.27$, $p < 0.001$) with AKS.

Conclusions: This study provides valuable new information about the variations, sources and factors that influence knowledge of asthma among educated individuals living in three European countries. The better AKS of Manchester students might be due to the higher prevalence of asthma in the UK.

Key words: Asthma. Asthma knowledge. Children. Education. Nurses. Questionnaire.

RESUMEN

Información preliminar: No se dispone de estudios que hayan evaluado y comparado el conocimiento del asma infantil entre sujetos residentes en distintas ciudades europeas. El objetivo de este estudio era determinar el conocimiento del asma infantil entre estudiantes de primer curso de enfermería durante la primera semana de su formación en tres ciudades europeas. También se evaluaron las fuentes de información de los participantes y otros factores que podrían haber influido en su puntuación de conocimiento del asma (PCA).

Correspondence:

L. García-Marcos
Dirección Salud Area II. Unidad Investigación
Pza. San Agustín, 3
30201 Cartagena. Spain
Tel.: + 34 968 326 679 - Fax: + 34 968 326 690
E-mail: lgmarcos@um.es

Métodos: Diseño transversal utilizando un cuestionario modificado validado previamente. El estudio se llevó a cabo con 261 estudiantes de Cartagena (España), 202 de Manchester (RU) y 94 de Colonia (Alemania).

Resultados: La PCA (puntuación máxima, 27) fue significativamente mejor en los estudiantes de Manchester (18,3 \pm 2,6) que en los de Cartagena (15,9 \pm 3,1) o Colonia (15,1 \pm 3,6). Más del 70 % de los estudiantes de las tres ciudades respondieron correctamente a 10 de las 27 preguntas. Los conocimientos sobre los fármacos para paliar o prevenir el asma eran muy limitados. La PCA reveló una correlación positiva pero débil con la edad de los estudiantes ($r = 0,11$, $p = 0,07$). Sólo se asociaron significativamente a la PCA los conocimientos adquiridos a partir de la experiencia personal ($r = 0,27$, $p < 0,001$).

Conclusiones: Este estudio proporciona nueva información de valor sobre las variaciones, las fuentes y los factores que influyen en el conocimiento del asma entre sujetos con estudios residentes en tres países europeos. La mayor prevalencia del asma en el Reino Unido podría justificar la mejor PCA de los estudiantes de Manchester.

Palabras clave: Asma. Conocimiento del asma. Infantil. Formación. Personal de enfermería. Cuestionario.

INTRODUCTION

Asthma is recognised in industrialised countries as the most common chronic disease of children¹. The International Study of Asthma and Allergies (ISAAC)² data have shown marked differences in the prevalence of childhood asthma in European countries. To our knowledge there are no studies that have evaluated differences in knowledge about childhood asthma and the sources of information among subjects living in different countries with different asthma prevalence rates. The objective of this study was to determine knowledge about childhood asthma among young educated subjects living in Spain, the UK and Germany, where the disease prevalence is 10 %, 30 % and 14 %, respectively¹. The study also sought the determine sources of the subjects asthma knowledge. We hypothesised that knowledge about childhood asthma would be better among subjects from the UK, because of it's higher childhood asthma prevalence rate.

METHODS

This cross-sectional study was undertaken at Schools of Nursing in Cartagena and Murcia (Spain), Manchester (UK) and Cologne (Germany), in 1999. The subjects were first year nursing students, who were invited to take part in this study, which involved completing a written questionnaire, during the first week of their training. We chose this sample at this particular moment when the subjects had no received specific training about asthma yet for two reasons: it would offer us an insight of the knowledge of the disease among high educated individuals of that age, and it could be used as a baseline for future comparisons on successive years of training. The study was approved by the relevant Research ethics committees at the three Schools of Nursing.

A previously validated written childhood asthma knowledge questionnaire^{3,4} was used for this study. Minor modifications were made to update the questionnaire in order to reflect changes in asthma management, i.e long acting β_2 agonists were included among the asthma medications; the answers to three questions that were originally open, were closed; and one question about asthma prevalence was omitted. Subjects were asked to select true or false answers to specific questions about the disease and it's treatment, and provide written answers two short open-ended questions. Additional new questions were added in order to gather the information about subjects' demographic data and their sources of knowledge about childhood asthma, e.g. their relations and friends. The questionnaire was translated from English into Spanish and German languages and then back translated into English. Questionnaires were distributed and self-completed while the students were in class.

The statistical analyses were performed using the SPSS software, version 10 (SPSS Inc., Chicago, IL, U.S.A.) for Windows. The normally distributed data are shown as mean \pm SD. The mean asthma knowledge score for the three centres were analysed using analyses of variance and Tukey's test was used for comparisons between the centres. The responses to questions were categorised as percentage of right answers and compared using the Chi² statistic. Each question was considered independent and when a significant test was encountered in a specific question, a post-hoc analysis was performed calculating the value of Chi between pairs of centres. Association between the mean asthma knowledge score and subjects' self-rated score for the importance of information source were examined using Pearson's correlation. Significance was accepted at $p < 0.05$ level.

RESULTS

The participation rate was over 95 % in the three cities. The mean age, percentage of male subjects and mean asthma knowledge scores of subjects at three sites are presented in table I.

The nursing students from Manchester were significantly older than those at Cartagena and Cologne, and age was weakly related to asthma knowledge score ($r = 0.11$, $p = 0.07$). The nursing school at Cartagena had significantly more male students than at Manchester and Cologne. The mean asthma knowledge score significantly differed in the three centres ($p < 0.01$), with the score being higher among Manchester students compared with those at Cartagena and Cologne. The gender did not influence the score in any centre.

The results for correct answers to individual questions about asthma, for subjects at each of three nursing schools are presented in table II. Questions on inheritance, infectiousness of asthma, inflammation, increased sensitivity of the air passage, the role of immunotherapy, swimming being the only suitable sport, adverse effect of parental cigarette smoking, that most treated asthmatic children live a normal life with no restrictions on activities, effect of asthma on growth and on the important role of preventive treatment in those with frequent symptoms were consistently good (> 70 % correct) among subjects at three centres. In contrast, answers to questions on medications used to treat acute exacerbations of asthma and those used to reduce the risk of future exacerbations were consistently poor (< 30 % correct) among subjects at three centres.

The knowledge about common symptoms of childhood asthma was significantly better among

students from Cologne than those from Cartagena and Manchester. More than 40 % of students from Cologne and Manchester but only 25 % of those from Cartagena thought that cow's milk increased mucous production. The knowledge about common triggers of asthma was better significantly among Cologne and Manchester students. Students from Cologne were more likely to believe that asthma itself or its treatment with salbutamol (Ventolin) damaged the heart. Students from Cartagena were more likely to believe that antibiotics had an important role in the treatment of childhood asthma. Significantly more students from Cologne believed that children with asthma should not eat dairy products than those from Cartagena and Manchester. More than 40 % students from Cartagena and Cologne but only 9 % from Manchester felt that asthmatic children had "nervous problems". Students from Cartagena and Cologne were more likely to believe that children with asthma were more likely to become addicted to their asthma drugs.

Subjects' sources of information about asthma and their relationship to their asthma knowledge score are shown in table III. For subjects at all three centres, the most useful important sources of information (score ≥ 5) were family and friends and television. Students from Manchester rated asthma information from health promotion publications and personal experience more highly than other sources of information (table III). For subjects at all three centres, only knowledge gained from personal experience was significantly associated with the asthma knowledge score ($r = 0.27$, $p < 0.001$).

Ten subjects (all from Manchester) mentioned in their questionnaires having gained information about childhood asthma through their own child/children's experience of the disease. The mean asthma knowledge score of these 10 subjects was 20.8 ± 1.9 which was significantly ($p < 0.005$) better than that of rest of the Manchester students (18.2 ± 2.5).

DISCUSSION

To the best of our knowledge this is the first study that has assessed knowledge and health beliefs about asthma among young educated subjects living in three European countries. We chose nursing students for two reasons: it would offer us an insight of the knowledge of the disease among high educated individuals of a similar age, and it could be used as a baseline for future comparisons on successive years of training. We recognize that the chosen population, being previously interested in health issues, could offer higher standards of disease

Table I

Characteristics of the subjects and the Asthma Knowledge Score (maximun 27) at the three centres. (ANOVA with Tukey's post-hoc test)

	Cartagena	Manchester	Cologne
Number	261	202	94
Age in years ^a	20.8 ± 4.1	26.0 ± 7.8	20.6 ± 2.5
Percent Male ^b	21.1	12.8	9.5
Asthma Knowledge Score ^c	15.9 ± 3.1	18.3 ± 2.6	15.1 ± 3.6

^a $p < 0.001$ for the whole group and Manchester vs. Cartagena and Manchester vs. Cologne.

^b $p < 0.001$ Cartagena vs. Manchester, Cartagena vs. Cologne and Manchester vs. Cologne.

^c $p < 0.001$ for the whole group & Manchester vs. Cartagena and Manchester vs. Cologne.

Table II
Results for correct answers (expressed as %) to individual questions about childhood asthma.
(Chi-square for each question analysed independently)

Question	CT	M	CL
1. The following are common symptoms of childhood asthma: Cough, Sneezing, Wheezing, Headache, Tightness of the chest, Breathlessness, Itching of the skin. (True or False for each one)	37	51	67 ^a
2. Children with asthma have abnormally sensitive air passages in their lungs. (True or False)	73	86	73
3. If one child in a family has asthma then all his/her brothers and sisters are almost certain to have asthma as well. (True or False)	98	94	98
4. Most children with asthma have an increase in mucus when they drink cows milk. (True or False)	75 ^a	57	48
5. The following conditions are the known triggers of asthma in childhood: Watching television, Infection, Exercise, The sun, Allergens e.g. pollen. (True or False for each Option)	33	53 ^b	65 ^a
6. The symptoms of asthma may be due to swelling of the lining of the air passages (inflammation) in the lungs. (True or False)	81	91	86
7. Asthma damages the heart. (True or False)	54	73 ^a	47
8. The following are commonly used treatments taken regularly, on a daily basis to "prevent" attacks. Aspirin, Inhaled steroids, (e.g. Pulmicort), Short acting β_2 agonists (e.g. Ventolin), Long acting β_2 agonists e.g. (Serevent), Oxygen, Oral steroids (e.g. Prednisolone). (True or False for each Option)	4	3	6
9. The following are treatments, which are commonly used to treat acute attacks of asthma: Aspirin, Inhaled steroids, (e.g. Pulmicort), Short acting β_2 agonists (e.g. Ventolin), Long acting β_2 agonists e.g. (Serevent), Oxygen, Oral steroids (e.g. Prednisolone). (True or False for each Option)	7	6	2
10. Antibiotics are an important part of treatment for most children with asthma. (True or False)	64 ^b	81	72
11. Most children with asthma should not eat dairy products. (True or False)	77	82	43 ^a
12. Allergy injections (vaccines) cure asthma. (True or False)	82	96 ^a	72 ^c
13. People with asthma usually have "nervous problems". (True or False)	54	91 ^a	51
14. Asthma is infectious (i.e. you can catch it from another person). (True or False)	99	99	99
15. Short courses of oral steroids (Prednisolone) usually cause significant side effects	46	57 ^a	34 ^c
16. Some asthma treatments (such as Ventolin) damage the heart. (True or False)	70	74	31 ^a
17. A 5 year old boy has an attack of asthma and takes two puffs of Ventolin from a puffer (metered dose inhaler). After 5 minutes he is no better. Give two reasons why this might have happened	11	26 ^a	16
18. During an attack of asthma starting at 11 p.m., which you are managing at home, your child is requiring the Salbutamol (Ventolin) spray given via a large volume spacer (Volumetric) every 2 hours. He/she is gaining benefit but is breathless after 2 hours. Provided that he/she does not get any worse it is fine to continue with the 2 hourly treatments until you contact your family doctor (GP) at 9 a.m. on the following morning (True or False)	55	53	60
19. Write down two ways of helping to prevent attacks of asthma during exercise	2	9 ^a	3
20. Children with asthma become addicted to their asthma drugs. (True or False)	34	82 ^a	47 ^c
21. Swimming is the only suitable exercise for asthmatics. (True or False)	81	90 ^a	78
22. Parental smoking may make the child's asthma worse. (True or False)	95	98 ^d	91
23. With appropriate treatment most children with asthma should lead a normal life with no restrictions on activity. (True or False)	93	96 ^d	89
24. The best way to measure the severity of a child's asthma is for the doctor to listen to his chest. (True or False)	62	64	44 ^a
25. Asthma symptoms are more likely to occur at night than during the day. (True or False)	45	39	32 ^c
26. Most children with asthma will have stunted growth. (True or False)	87 ^b	95 ^a	71
27. Children with frequent symptoms of asthma should have preventive drugs. (True or False)	75	84 ^a	75

CT: Cartagena; M: Manchester; CL: Cologne.

^ap < 0.01 significantly different from each of the other two centres.

^bp < 0.01 M vs. CT.

^cp < 0.05 CT vs. CL.

^dp < 0.05 M vs. CL.

Table III

Subjects' source of information about asthma, which were self-graded between 1 (not at all important) and 10 (very important). Mean and 95 % CI. (ANOVA with Tukey's post-hoc test)

Sources of information	Cartagena	Manchester	Cologne
Journals & magazines	3.6 (3.3-4.0)	3.8 (3.4-4.2)	4.6 (4.0-5.1)
Television	5.3 (4.9-5.7)	5.4 (4.97-5.76)	5.0 (4.5-5.6)
Radio ^a	2.5 (2.2-2.7)	2.7 (2.4-3.1)	1.9 (1.5-2.2)
Internet	1.4 (1.2-1.6)	1.6 (1.3-1.9)	1.2 (0.8-1.6)
Family & friends	5.9 (5.6-6.3)	6.3 (5.9-6.7)	5.8 (5.2-6.5)
Health promotion publications ^b	4.4 (4.0-4.7)	5.7 (5.3-6.1)	4.8 (4.2-5.5)
Personal experience ^c	3.5 (3.1-4.0)	5.3 (4.8-6.0)	3.4 (2.7-4.1)
School & college	4.0 (3.7-4.4)	4.9 (4.5-5.4)	4.8 (4.2-4.7)

^ap < 0.05 M vs. CL.

^bp < 0.001 M vs. CT.

^cp < 0.0001 M vs. CT and M vs. CL.

knowledge than other similarly educated group of individuals, like engineering students.

The mean asthma knowledge score of Manchester students was significantly higher than those at Cartagena and Cologne nursing schools. There are several possible explanations for this. The ISAAC study results have shown that the UK has one of the highest prevalence of childhood asthma in the world². Thus, the higher prevalence of asthma in the UK might be one reason for the better asthma knowledge score of Manchester students. While our questionnaire did not contain a specific question about subjects' personal history and experience of childhood asthma (an information that could not be retrieved afterwards), the ISAAC asthma prevalence makes it more likely that many more of Manchester students are likely to have suffered from childhood asthma centres. Further, indirect support for this thesis comes from our finding that knowledge gained from personal experience was significantly associated with the subjects' asthma knowledge score. The Manchester nursing students were significantly older than those at Cartagena and Cologne nursing schools. Thus it is possible that maturity and more "life experiences" of Manchester Students contributed to their higher asthma knowledge score. In fact, age of subjects was related to asthma knowledge score in simple correlation analyses. It is noteworthy that ten subjects from Manchester who mentioned their own child/children's experience of asthma had significantly better asthma knowledge scores than that of rest of the Manchester students. Unfortunately, our questionnaire did not contain a specific question about asthma in offspring of the

subjects', but it is possible that older Manchester cohort were more likely to have children than students at Cartagena and Cologne. We believe that this factor might have also contributed to better asthma knowledge scores of Manchester students. Finally, it is possible that Students in Manchester have had a greater exposure to public health education campaigns about asthma. Support for this thesis comes from our finding that students from Manchester regarded information from health promotion publications as one of the two most important sources of information about the condition.

It was reassuring that knowledge about childhood asthma and its treatment was satisfactory (total score > 70 %) for 10 out 27 questions about the disease, among students at the three centres (table II). However, interesting differences in responses were observed among students according to country of residence. For example, students from Cologne were more likely to believe that asthma itself or its treatment with salbutamol (Ventolin) damaged the heart. This belief, in part is likely to stem from the tachycardia that commonly occurs with β_2 agonists, such as salbutamol, when they are used for treatment of acute exacerbation of asthma.

More students from Cologne or Manchester than Cartagena thought that cow's milk increased mucous production. This might be due to the ambiguity in interpretation of the question so that it might have been confused with allergy to cow's milk. Students from Cologne provided more false answers to the question that most children with asthma should not eat dairy products. This might be due to a strong health belief that asthma is predominantly an allergic rather than an inflammatory condition. Significantly more students from Cartagena and Cologne felt that asthmatic children had "nervous problems". This might in part be due to an agitated and confused appearance of a hypoxic patient with severe exacerbation of asthma. Widespread usage of "over the counter" bought antibiotics in Spain probably explains why the students from Cartagena were more likely to believe that antibiotics had an important role in the treatment of childhood asthma. It is matter of some concern that Students from Cartagena were more likely to believe that children with asthma were more likely to become addicted to their asthma drugs. This response suggests compliance with preventative therapy with inhaled steroids, long acting β_2 agonists, which are the mainstay of therapy in children with moderate to severe asthma, might be poor in Spain. Further studies are needed to explore the reasons for this belief.

Clearly, there are several shortcomings and limitations of the study. As mentioned before, no question

that asked if subjects had their own children and whether they were asthma sufferers. There was also failure to include a question on subject's personal history of asthma. Based on the ISAAC data, it is likely that more students from Manchester had suffered from childhood asthma symptoms. In spite of these limitations, this study has provided novel information about knowledge of, and beliefs about childhood asthma among young educated people brought up Spain, the UK and Germany. As mentioned above answers to some of the questions such as asthma or it's treatment damage the heart and patients are at risk of becoming addicted to asthma medications need addressing through the nurse training curriculum and health promotion for the general public. It will be interesting to see if the knowledge scores of this cohort of students, determined by the same questionnaire, improves as they progress through their nurse training.

In conclusion, results of our study has provided "base-line" knowledge about childhood asthma

among educated young adults about to embark on their nursing training and career, and could help to find ways to improve asthma knowledge among the general population. Our data also provide a unique insight into health beliefs about the commonest chronic childhood illness, among young adults living in Spain, the UK and Germany.

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