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CLINICAL & BASIC RESEARCH

Attitudes of Non-Asthmatic Children Towards Their Asthmatic Peers

Influence of interactions with asthmatic relatives and peers

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مواقف الأطفال الغير مصابين بالربو تجاه أقرانهم المصابين بالمرض

تأثير التفاعل مع بالربو الأقارب والأقران

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abstract: ***Objectives:*** This study aimed to examine non-asthmatic children's acceptance of and attitudes towards their asthmatic peers in Jordan. ***Methods:*** This descriptive cross-sectional study was conducted between September 2015 and January 2016 among 1,812 non-asthmatic children aged 9–13 years old at 10 schools in Zarqa, Jordan. Arabic versions of the Peers Attitude Towards Children with Asthma scale and the Asthma Knowledge Test for Children were used to assess attitudes towards children with asthma and asthma-related knowledge, respectively. ***Results:*** A total of 1,586 children participated in the study (response rate: 87.5%). Of these, 158 (10%) and 399 (25.2%) children reported a family history of asthma or knew at least one person with asthma, respectively. Although 50.3% stated that they would sit next to such children in the classroom, only 34.9% reported that they would be friends with an asthmatic child. However, 73.1% of the non-asthmatic children believed that asthmatic children were not pretending to be ill and 61.4% believed that such children were not ill due to their own carelessness. Female non-asthmatic children (P <0.001), those with a family history of asthma (P = 0.004) and those who knew other individuals with asthma (P <0.001) had significantly more positive attitudes towards and acceptance of their asthmatic peers. In addition, age was significantly related to attitude scores (P <0.001). However, there was no correlation between asthma-related knowledge and the children's attitudes towards peers with asthma (P = 0.611). ***Conclusion:*** Previous interactions with asthmatic family members or peers were found to significantly influence non-asthmatic children's attitudes towards their asthmatic peers.

Keywords: Asthma; Children; Attitudes; Knowledge; Jordan.

الملخص: الهدف: هدفت هذه الدراسة إلى التعرف على مدى قبول وموافقة الأطفال غير المصابين بالربو تجاه نظرائهم المصابين في الأردن. **الطريقة:** أجريت هذه الدراسة الوصفية المستعرضة بين سبتمبر 2015 ويناير 2016 على 1,812 من الأطفال غير المصابين بالربو الذين تتراوح أعمارهم بين 9–13 سنة في 10 مدارس في الزرقاء، الأردن. تم استخدام الإصدارالعربي من مقياس اتجاه النظراء من الأطفال حول أقرانهم الذين يعانون من الربو واختبار مدى معرفتهم بمرض الربو لتقييم مواقف الغير مصابين تجاه الأطفال الذين يعانون من الربو ومدى المعرفة المتعلقة بالربو. **النتائج:** شارك 1,586 طفل في الدراسة (معدل الاستجابة: 87.5%). من بين هؤلاء، أبلغ 158 من الأطفال (10%) و 399 (25.2%) عن تاريخ عائلي للربو أو كانوا يعرفون شخصًا واحدًا على الأقل مصابًا بالربو، على التوالي. وعلى الرغم من أن 50.3% ذكروا أنهم سيجلسون بجانب هؤلاء الأطفال في الفصل، أفاد 34.9% منهم فقط أنهم قد يصادقوا طفلا مصابا بالربو. ومع ذلك، يعتقد 73.1% من الأطفال غير المصابين بالربو أن الأطفال المصابين بالربو لا يتظاهرون بأنهم مرضى و 61.4% يعتقدون أن هؤلاء الأطفال ليسوا مرضى بسبب إهمالهم. كان لدى الإناث اللواتي لا يعانين من الربو (P <0.001)، واللواتي لديهن تاريخ عائلي من الربو (P = 0.004) وأولئك الذين يعرفون أشخاصًا آخرين يعانون من الربو (P <0.001) مواقف أكثر إيجابية تجاه قبول أقرانهم المصابين بالربو. بالإضافة إلى ذلك، كان العمر مرتبطا بشكل كبير مع درجات قبول الأطفال المصابين بالربو (P <0.001). ومع ذلك، لم يكن هناك ارتباط بين المعرفة المتعلقة بالربو ومواقف الأطفال تجاه أقرانهم الذين يعانون من الربو (P = 0.611). **الخلاصة:** وجد أن التفاعلات السابقة مع أفراد من العائلة مصابين بالربو أو الأقران تؤثر بشكل كبير على مواقف الأطفال غير المصابين بالربو تجاه أقرانهم المصابين.

الكلمات المفتاحية: الربو؛ الأطفال؛ الاتجاهات؛ المعرفه؛ الأردن.

Advances in Knowledge

- *In the current study, female non-asthmatic children, those with a family history of asthma and those who knew someone with asthma had significantly more positive attitudes towards their asthmatic peers in Zarqa, Jordan.*

Application to Patient Care

- *Healthcare providers in Jordan should promote positive attitudes towards children with asthma in clinical practice.*

Childhood asthma is a long-term respiratory disease which impacts both physical and emotional wellbeing, often affecting the patient's daily quality of life (QOL).[1,2] Previous studies have indicated that children with chronic illnesses often suffer from reduced academic performance

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due to disease-associated exacerbations, absenteeism and stress.[3,4] Moreover, children with illnesses are often less accepted or engaged with by their peers.[5–8] For children with asthma, QOL may be affected by social acceptance or rejection by their peers in light of the stigma associated with the disease.[3,9] In general, Graetz *et al*. found that children with asthma who were more frequently hospitalised were less preferred as playmates by other children and perceived to be more sensitive and isolated.[5] Another study demonstrated that symptomatic evidence of a disease negatively influenced some children's perceptions of and responses towards their sick peers.[10]

Unfortunately, social rejection and negative attitudes often have an unfavourable impact on the wellbeing of the ill child.[6,11–13] The role of peer support in facilitating psychosocial adjustment among children has proven beneficial in improving resilience and well-being.[8] Therefore, direct contact between healthy and ill children is highly advised in order to effectively improve the attitudes of the former towards the latter.[7,11,14,15] Previous research has indicated that greater asthma-related knowledge and being female positively affect children's attitudes towards their asthmatic peers.[11,16] Such research is important in order to identify appropriate interventions to improve asthma-related attitudes in schools and the wider community. Specifically, it is important to study whether having a family history of asthma or knowing others (i.e. a friend, peer or relative) with asthma positively contributes to children's acceptance of or attitudes towards their diseased peers.

In Jordan, the prevalence of asthma is comparable to that of other developed countries.[17] However, this may be due to underdiagnosis of the condition; a review from the Middle East indicated a noticeable increase in the prevalence and burden of asthma due to increased public and professional awareness of the disease.[18] Frequent asthma-related triggering factors include respiratory tract infections, exercise, dust and parental smoking.[17,19] Nevertheless, there are few asthma health education and promotion programmes targeting children and adolescents in Jordan.[19]

This study aimed primarily to examine the association between attitudes towards peers with asthma among non-asthmatic children and having a family history of asthma or knowing someone with asthma. Based on the outcomes of studies evaluating perceptions of physical disability, it was hypothesised that interactions with family members or peers with asthma would positively influence acceptance of and attitudes towards asthmatic peers among non-asthmatic children.[14,15] The second aim of the study was to investigate the relationship between non-asthmatic children's levels of asthma-related knowledge and their attitudes towards their asthmatic peers. Finally, the third aim was to determine asthma-related knowledge and attitudes among children without asthma.

Methods

This descriptive cross-sectional study was conducted between September 2015 and January 2016 at 10 schools in the second educational district of Zarqa, Jordan. These schools included nine governmental schools and one private school and were recruited from a list of 100 schools in Zarqa, including 29 male-only schools, 23 female-only schools and 48 coeducational schools. A simple random sampling technique was subsequently used to select one class of children from each grade between grades 4–7 at the selected schools. Overall, 1,812 non-asthmatic children aged 9–13 years old were invited to participate in the study.

Three questionnaire tools were utilised to gather data from the participants. Demographic information was elicited using a four-item questionnaire, including age, gender, the presence of a family history of asthma and pre-existing relations with individuals with asthma. Subsequently, the 10-item Peers Attitude Towards Children with Asthma (PACA) scale was used to measure attitudes towards (items 3, 4, 5, 7, 8 and 10) and acceptance of (items 1, 2, 6 and 9) children with asthma on two subscales.[11] The children responded to each item with yes/no responses, with a score of one given to a positive response and zero to a negative response. After reverse scoring negatively-worded items, the scores were summed up to provide a total overall score, in which higher overall scores indicated more positive attitudes towards children with asthma. Finally, the 22-item Asthma Knowledge Test for Children was used to assess the children's general knowledge about asthma, including its triggers, symptoms, treatment and management.[20] This questionnaire consisted of 21 true/false items and one item asking the child to list three symptoms of asthma. One point was awarded for each correct answer or symptom listed, for a maximum of 24 points. Correct responses to each item were summed to provide a total score.

All of the questionnaires were translated into Arabic and pilot-tested for comprehension and clarity among a group of children with similar characteristics to that of the study sample. The final questionnaires were distributed among selected classes with the aid of classroom teachers. When necessary, the teachers also helped the children to read and complete the forms. A total of 81 students who self-reported an asthma diagnosis were excluded from the analysis.

Data were analysed using the Statistical Package for the Social Sciences (SPSS), Version 22.0 (IBM Corp., Armonk, New York, USA). Descriptive statistics were used to illustrate the characteristics and attitude scores of the sample. In addition, a correlation coefficient test was used to examine the relationship between asthma-related knowledge and attitude scores. A *P* value of ≤0.050 was considered statistically significant. In order to identify the effect of a family history of asthma and previous relations with other asthmatic individuals on the children's attitudes, a multiple regression analysis was performed using all factors associated with attitude scores as independent variables. However, this technique was not successful due to the violation of multiple regression assumptions (i.e. multicollinearity). Instead, a Student's t-test and analysis of variance were performed, with a Bonferroni adjustment made to the alpha value (*P* <0.001).

Ethical approval to conduct this study was obtained from the Hashemite University Institutional Review Board (#2015/2014/2/3) and the Ministry of Education in Jordan (#2/7/1/8221). In addition, the appropriate authorities at each school gave permission for the study to be conducted. Parental informed consent was obtained for each of the children prior to their participation in the study.

Results

A total of 1,586 non-asthmatic children participated in the study (response rate: 87.5%). Of these, 659 (41.6%) were male and 927 (58.4%) were female. A family history of asthma was reported by 158 children (10%), while 399 (25.2%) stated that they knew at least one person with asthma. The mean total PACA score was 4.97 ± 2.11 out of 10, with mean total scores for the acceptance and attitudes subscales being 1.73 ± 1.10 out of 4 and 3.24 ± 1.47 out of 6, respectively. Total knowledge scores ranged from 0–21, with a mean score of 11.5 ± 3.09 out of 24.

In terms of attitudes towards and acceptance of asthmatic children, the percentage of positive responses ranged from 30.1–59.9% for positively-worded items and 26.9–56.9% for negatively-worded items. While 73.1% of students in the current study believed that children with asthma do not pretend to be sick and 61.4% believed that asthmatic children were ill due to factors other than carelessness, only 34.9% reported that they would be happy to accept children with asthma as their friends. In addition, only 30.1% believed that such children could participate in sports, while just over half (50.3%) did not mind sitting next to them. However, despite these generally negative attitudes, most children (59.9%) stated that they did not mind if their asthmatic peers used their inhalers in class [Table 1]. With regards to asthma-related knowledge levels, the percentage of correct responses to each item ranged widely from 15.2–79.4% [Table 2]. Overall, 74.1% of the children gave correct responses to six items, while 49.3% provided correct responses to 15 items.

Table 1: Attitudes towards children with asthma* among non-asthmatic children in Jordan (N = 1,586)

Item	Positive responses, n (%)†
Positively-worded items	
1. I am happy to be the friend of a child with asthma	542 (34.9)
3. Children with asthma usually do well at school	734 (47.8)
6. It is acceptable for a child with asthma to use their puffer (inhaler) in class	927 (59.9)
9. Children with asthma can participate in all school activities such as sports and games	463 (30.1)
Negatively-worded items	
2. I do not like sitting next to a child with asthma	775 (49.7)
4. Children with asthma often have a bad temper	750 (48.5)
5. Children with asthma are shy about their disease	721 (46.8)
7. Children with asthma get sick because they are careless	595 (38.6)
8. Children with asthma often pretend to be sick	414 (26.9)
10. Children with asthma get more attention from the teachers than other children	878 (56.9)

**Assessed using an Arabic version of the 10-item Peers Attitude Towards Children with Asthma scale.[11] †Percentages are not calcul-ated out of the total sample due to missing data for certain items.*

Overall, female students ($t_{[1,566]}$ = -4.3; *P* <0.001), those with a family history of asthma ($t_{[1,566]}$ = 2.9; *P* <0.004) and those with prior knowledge of someone with asthma ($t_{[1,566]}$ = -7.6; *P* <0.001) had significantly more positive attitudes towards their asthmatic peers [Table 3]. Age was also significantly positively correlated to attitude scores (r = 0.14; *P* <0.001). However, there was no correlation between levels of asthma knowledge and attitudes towards asthmatic peers (r = 0.01; *P* = 0.611).

Discussion

The current study aimed to explore the possibility that interactions with asthmatic family members or peers would have a positive influence on the acceptance of and attitudes of non-asthmatic children towards their

Table 2: Asthma-related knowledge* among non-asthmatic children in Jordan (N = 1,586)

Item	Correct responses, n (%)†
1. Lots of children have asthma	770 (48.6)
2. Children with asthma can play with other children	619 (39.1)
3. People with asthma can drink milk and eat yoghurt	1,214 (76.6)
4. Having the flu (influenza) can cause an asthma attack	930 (58.7)
5. Smoking is acceptable for people with asthma	241 (15.2)
6. People with asthma become addicted to their medication	967 (61)
7. If you do not have asthma now, you will never get it	582 (36.7)
8. An asthma attack is caused by hypersensitivity and inflammation in the airways of the lungs	1,216 (76.7)
9. Most children with asthma are smaller than other children	561 (35.4)
10. Asthma can be spread from person to person	693 (43.7)
11. If one child in a family has asthma, then their brothers and sisters will have asthma too	391 (24.7)
12. People with asthma can die if they are not treated	1,237 (78)
13. Medicines that keep asthma from happening should be taken every day	1,175 (74.1)
14. A puffer (inhaler) should be used when a person has an asthma attack	965 (60.9)
15. Having pet birds is acceptable for people with asthma	320 (20.2)
16. Asthma attacks happen more frequently at night	1,057 (66.7)
17. It is acceptable for people with asthma to swim and play sports	532 (33.6)
18. Asthma medicines can hurt the heart	697 (44)
19. Rest is needed to stop an asthma attack	1,187 (74.9)
20. When asthma is controlled, all medicines can be stopped	781 (49.3)
21. With the right treatment, a child with asthma can live a normal life	1,259 (79.4)
22. Can you list three signs of asthma?	
No correct symptoms	248 (16.6)
One correct symptom	441 (28.3)
Two correct symptoms	487 (31.2)
Three correct symptoms	363 (23.9)

**Assessed using an Arabic version of the 22-item Asthma Knowledge Test for Children.[20] †Percentages are not calculated out of the total sample due to missing data for certain items.*

Table 3: Factors influencing attitudes towards children with asthma* among non-asthmatic children in Jordan (N = 1,568)†

Factor	n	Mean attitude score	*P* value‡
Gender			
Male	644	4.7 ± 1.9	<0.001
Female	924	5.2 ± 2.2	
Family history of asthma			
Present	149	5.5 ± 2.2	0.004
Absent	1,419	4.9 ± 2.1	
Prior knowledge of someone with asthma			
Present	399	5.7 ± 2.1	<0.001
Absent	1,169	4.7 ± 2.0	

df = degrees of freedom.

**Assessed using an Arabic version of the 22-item Asthma Knowledge Test for Children.[20] †The total number of children who completed both the knowledge and attitude questionnaires. ‡A P value of ≤0.001 was considered significant after a Bonferroni adjustment was made to the alpha value.*

asthmatic peers. However, compared to other studies from developed countries which revealed more positive attitudes and higher levels of asthma-related awareness, the current study revealed that non-asthmatic Jordanian children held mostly negative attitudes towards their asthmatic peers and had low levels of asthma-related knowledge.[11–13,21,22]

In the present study, the majority of asthma knowledge-related items were answered incorrectly by most non-asthmatic children. This lack of knowledge extended across all aspects of the disease, including its causes, symptoms, treatment and management. A previous study conducted in northern Jordan similarly reported low levels of asthma-related knowledge among adolescents in contrast to studies from the USA.[19,23,24] Additionally, the findings of the current study indicated a negative attitude trend extending across all components of the scale. Moreover, high knowledge scores did not necessarily correlate with more positive attitudes. This is in contrast to a previous study of Australian children which found that higher knowledge scores correlated positively with attitude scores.[11] This variation in findings may be attributable to differences in the average knowledge scores between the two samples, particularly as the Australian children had higher total scores than children in the current sample.[11] This finding suggests that attitudes should be measured while controlling for knowledge scores, particularly when assessing potential influences such as a family history of asthma or knowing others with asthma.

A previous study found that a family history of asthma and prior knowledge of others with asthma were not significantly related to attitudes towards asthmatic peers among non-asthmatic Australian children.[11] This finding was attributed to the high level of acceptance of asthmatic peers among their studied sample. In contrast, both of these factors along with being female were found to positively contribute to total attitude scores in the current study. The low level of acceptance of asthmatic peers noted in the present study underlines the importance of social interactions between non-asthmatic and asthmatic children so as to foster positive attitudes and acceptance among the former group towards the latter.[12] Children with asthma have reported feelings of anxiety and embarrassment about their illness which affected their attitudes towards self-treatment.[25] It is therefore important to change social perceptions of chronic illnesses in order to foster a positive attitude towards affected patients.[6,10,16] Healthcare providers in Jordan should therefore seek to educate children regarding childhood asthma as well as promote positive attitudes towards asthmatic children among their non-asthmatic peers.

The current study was limited by its cross-sectional nature which does not imply a causal relationship; an interventional case-control study might have produced more valid results. In addition, a longitudinal rather than descriptive design would have contributed to the strength of the findings. However, this could not be achieved due to feasibility-related constraints such as lack of time and funds. Another limitation of the study was the reliance on self-reported data potentially subject to reporting bias. In addition, this study was conducted in only one region of Jordan; as such, the results cannot be generalised on a national level.

Conclusion

The results of this study indicated low levels of asthma-related knowledge and generally negative attitudes towards asthmatic peers among non-asthmatic students in Zarqa, Jordan. Gender, age, a family history of asthma and prior knowledge of someone with asthma positively influenced attitudes towards asthmatic peers. Therefore, additional interactions between non-asthmatic and asthmatic children may be helpful in improving children's attitudes towards their asthmatic peers. Healthcare professionals should encourage positive interactions between non-asthmatic and asthmatic children in order to improve the knowledge and attitudes of non-asthmatic children towards their asthmatic peers.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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