

What Physical Education Teachers Know About Asthma: Impact of a Training Course

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Given the current prevalence of asthma in developed countries, there are likely to be at least 2 or 3 asthmatic children in most classes. However, few teachers have received training on how to manage the disease [1,2]. A previous study in Portugal showed teacher knowledge of asthma to be deficient [3]. Asthma is particularly challenging for physical education (PE) teachers, because they must motivate asthmatic students and instruct them on how to participate in physical activities, which may prove to be a powerful trigger of asthma [4]. Therefore, it is essential that PE teachers have appropriate knowledge of exercise-induced asthma. Training

can improve teachers' knowledge of the disease, thus leaving them more prepared to manage asthmatic students [5]. We aimed to assess PE teachers' knowledge of asthma and to evaluate the effects of a training course.

During 2015, the Interest Group of Allergy, Asthma and Sports of the Portuguese Society of Allergy and Clinical Immunology provided PE teachers with 5 modules of a course entitled "Allergic Diseases in Sports". The course, the program, and the speakers were approved by the National Scientific and Pedagogic Committee of Education, and accreditation was granted. Each module comprised theoretical and practical areas and took 16 hours over 2 consecutive days. The program also included lessons on rhinitis, anaphylaxis, and urticaria. The 5 modules were repeated in 5 different regions of Portugal (Ponta Delgada, Coimbra, Lisboa, Madeira, and Porto). All modules had exactly the same contents, and the presentations previously prepared by the speakers remained unchanged throughout the program. The course was free of charge.

We developed a 20-item self-administered questionnaire based on prior existing asthma knowledge questionnaires (Supplementary Material) [2,3]. Each question had a score of 1 (maximum total score, 20). The questionnaire included 4 different categories of questions: 6 questions related to general knowledge of the disease, 3 questions related to common beliefs, 4 questions related to asthma triggers, and 7 questions related to treatment and prevention of asthma. Additionally, there were 3 questions regarding personal and/or family history of asthma and previous contact with asthmatic children. Before starting the lessons, the attendees were asked to complete the questionnaire, which was anonymous and coded. The participants were asked to memorize the code, and, at the end of the course, the same questionnaire was filled in and coded to pair for statistical analysis.

Categorical variables are expressed as absolute values (%) and continuous variables as mean (SD). The McNemar test was used to assess changes between baseline and after the intervention. The analyses were performed with IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp).

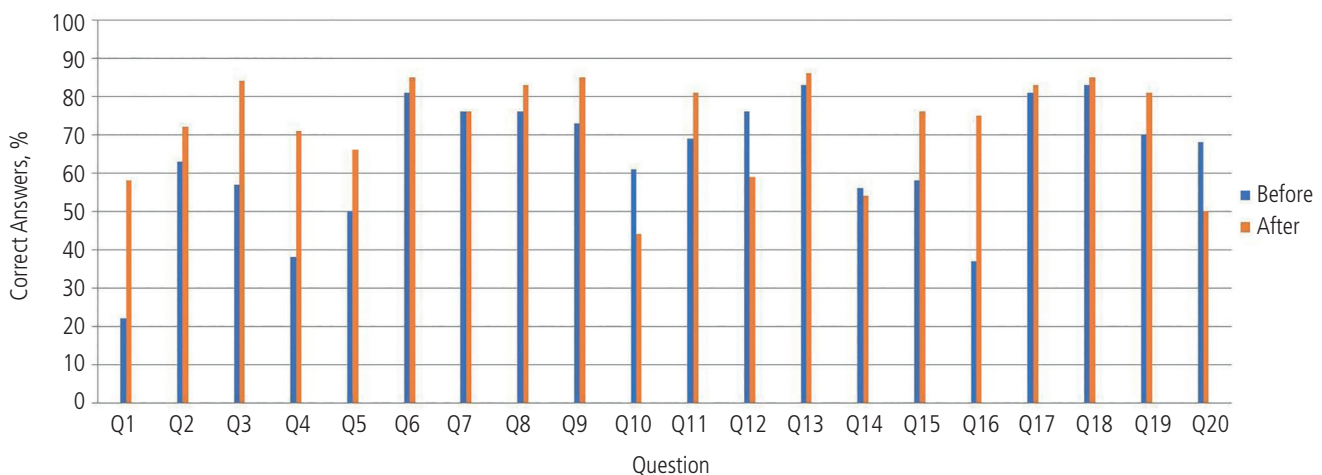


Figure. Percentage of correct answers before and after the course.

A total of 86 PE teachers from the 5 regions returned the completed matching questionnaires (mean [SD] age 47.9 [8.1] years; 58 females [67%]) (Supplementary Material). The score improved after the course for most questions (Figure), except questions 7 (general knowledge), 10, 12, 20 (beliefs), and 14 (treatment). At baseline, 74% of answers were positive (mean score, 15.57 [1.86]), increasing after training to 85% (17.23 [1.67]). This increase was statistically significant for questions regarding general knowledge about asthma ($P < .001$), triggers ($P < .001$), and treatment ($P < .001$), but not for questions targeting beliefs. Eighty-four PE teachers (98%) had ≥ 1 asthmatic student in their class. An analysis of the possible effect of personal contact with asthma ($n=12$; 14%) or family contact with asthma ($n=20$; 23%) revealed no significant differences.

The teachers in this sample showed a reasonable degree of knowledge about asthma. Our findings are better than those reported by other authors [3], who found knowledge of asthma among general teachers to be deficient (mean score, 17.7 out of 30). However, in that study only 60% of the teachers had or had had an asthmatic student [3], compared with 98% in our sample. Therefore, we would expect even better results.

Also important is the fact that we included only PE teachers, whose understanding of exercise-induced asthma was not ideal. A low proportion were aware that exercise may induce wheezing or that it could be prevented by pretreatment. About 70% of PE teachers knew that exercising in cold weather can exacerbate asthma, although only about 50% knew that exercise was a common trigger. It is important that PE teachers are able to recognize when an asthmatic child is becoming symptomatic and to be aware of the stimuli that might trigger an exacerbation. Still, asthmatic children should be encouraged to fully participate in school sports and activities while taking appropriate medication. Therefore, PE teachers must have proper knowledge in order to feel confident in this role. Bearing in mind how relevant it is to recognize asthma attacks and to treat them promptly with a bronchodilator inhaler, it is important to promote training courses with a practical part during which teachers are trained in inhaler technique. Given the close relationship between asthma and allergy, courses should include other allergy-related conditions (eg, rhinitis, anaphylaxis, and urticaria), as was the case in our program. Specific training on anaphylaxis has been shown to be effective [6].

Our study is subject to limitations. Although based on existing questionnaires, the current one has not been validated. Given the anonymization process, we were unable to assess whether demographic characteristics were associated with better baseline knowledge or more marked improvement. Furthermore, we were unable to assess differences between age groups or sexes. Although we have offered courses in the most representative areas of Portugal, our results cannot be generalized, and selection bias is probable, since those who signed up were particularly interested in this issue [7]. In any case, these data clearly demonstrate some lack of knowledge of asthma among PE teachers, and even about the association between asthma and sports. We showed that a training course enables a significant improvement.

Asthma management is difficult, and treatment involves both a personalized and a global approach [8]. The magnitude

of the asthma burden and its social and economic impact justifies the implementation of asthma training programs in schools. By improving knowledge of asthma, clarifying erroneous beliefs, and promoting the organization of basic medical care for asthma exacerbation in schools, we can contribute to the full integration of asthmatics and to reduce the social and economic costs of asthma. Our data reinforce the importance of sharing knowledge between different professional groups as a means of improving the care of patients with asthma.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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