



ORIGINAL ARTICLE

## Schoolchildren with chronic diseases; What are teachers worried about?<sup>☆</sup>

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Anaphylaxis;  
Basic life support;  
Training.

### Abstract

**Introduction:** As the number of schoolchildren with chronic diseases is constantly increasing, teachers must be aware of this new reality and of the special needs of these children. However, there is very little information about the knowledge, skills, and concerns of teachers when faced with a possible urgent situation that could occur in a child with a chronic disease. For this reason, this study has been conducted.

**Methods:** An anonymous questionnaire with simple questions about seizures, diabetes, anaphylaxis, and basic cardiopulmonary resuscitation (CPR) was completed by 244 primary and secondary school teachers. They subsequently participated in short workshops focused on the management of medical emergencies in relation to these conditions.

**Results:** The majority (60%) of the teachers had at least one child in their classroom with a chronic disease, with epilepsy being the most frequent. Their main concern was not knowing how to act in a potentially serious situation. As regards hypoglycaemic crises and anaphylaxis, teachers who had at-risk pupils were not sure if they would be able to use the recommended medication, although they knew how to use it.

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**PALABRAS CLAVE**

Escolares;  
 Profesores;  
 Enfermedad crónica;  
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 Hipoglucemia;  
 Anafilaxia;  
 Reanimación  
 cardiopulmonar  
 básica;  
 Formación.

*Conclusions:* Teachers of the study were concerned about not knowing what to do in an emergency event in a schoolchild with chronic illness. Although some had received information about the medication to be administered, they were not sure if they would be able to do so. The training and self-confidence of teacher should be improved in order to cope with possible critical situations in schoolchildren with chronic diseases.

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**Escolares con enfermedades crónicas, ¿qué les preocupa a sus profesores?****Resumen**

*Introducción:* Cada vez hay más niños escolarizados con enfermedades crónicas, por lo que los profesores deben ser conscientes de esta nueva realidad y de las necesidades especiales que pueden tener estos alumnos. Sin embargo, tenemos muy poca información sobre los conocimientos, actitudes y preocupaciones de los profesores ante una posible situación de riesgo en un escolar con alguna enfermedad crónica, motivo por el que se ha realizado el presente estudio.

*Métodos:* Cuestionario anónimo con preguntas sencillas sobre crisis convulsivas, diabetes, anafilaxia y reanimación cardiopulmonar básica, realizado a 244 profesores de educación primaria y secundaria, previa a su participación en talleres breves centrados en el manejo de urgencias médicas en relación con dichas patologías.

*Resultados:* El 60% de los profesores encuestados tenía en clase al menos un alumno con patología crónica, la más frecuente la epilepsia. Su principal preocupación era desconocer cómo actuar ante una situación potencialmente grave. En relación con las crisis hipoglucémicas y la anafilaxia, los profesores que tienen alumnos de riesgo, si bien conocen cuál es la medicación recomendada, no saben utilizarla correctamente.

*Conclusiones:* Los profesores de nuestro medio muestran preocupación ante el desconocimiento de las actuaciones que deben acometer ante un evento urgente en un escolar con enfermedad crónica. Aunque algunos han recibido información sobre la medicación a administrar, no están seguros de ser capaces de hacerlo correctamente. Por tanto, se debería mejorar la formación, capacitación y autoconfianza de los educadores en la atención a posibles situaciones urgentes en escolares con enfermedades crónicas.

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**Introduction**

Children with chronic diseases must attend school and have the right to receive an education guaranteeing their full individual development and social integration, independently of their health condition.

The exacerbations of some chronic diseases may be life threatening to children and may occur in any setting: household, community or school. For this reason, for a few years now some schools in the autonomous community of Galicia, in coordination with emergency care teams, have been making efforts to optimising and standardising the response of teaching staff in these situations. Specifically, a protocol for the management of students with chronic diseases by medical emergency and school-based services (*Protocolo de Actuación en Urgencias Sanitarias y Atención Educativa al Alumnado con Enfermedad Crónica*)<sup>1</sup> has been established to facilitate urgent delivery of care to chronically ill students by teaching staff if they experience severe decompensation in the school setting, following training of the staff to provide them with the necessary skills.

In addition to having the necessary knowledge, the attitudes of the teaching staff are key for the management of chronic diseases in children in the school setting. However, teachers are generally worried about the possibility of facing a life-threatening situation in a student in the school setting, especially those who have less experience or have not received specific training on the subject. This is a source of anxiety not only with regard to deliver of care to students at the time of the emergency, but also in relation to the potential legal repercussions of responding inadequately.

In this context, we planned a study with the main objectives of identifying the concerns of teachers in relation to chronic diseases in the student body and assessing potential lacks in this collective in relation to the management of a serious situation in these children.

**Material and methods**

We developed a simple questionnaire with items concerning the management of epileptic seizures, hypoglycaemic episodes in diabetic children and anaphylactic reactions in

**Table 1** Characteristics of the sample.

<i>N</i> = 244	<i>n</i>	%
<i>Sex</i>		
Male	55	22.5%
Female	180	73.8%
<i>Age (years)</i>		
< 30	13	5.3%
30–40	71	29.1%
40–50	99	40.6%
50–60	56	23%
> 60	3	1.2%
<i>Professional experience (years)</i>		
< 2	3	1.2%
2–5	20	8.2%
5–10	37	15.2%
10–20	112	45.9%
> 20	66	27.1%

students with allergies to be completed anonymously by teachers of primary and secondary education. We chose these diseases on account of their high prevalence and because they are specifically included in the School Alert Programme of the Government of Galicia, Spain.<sup>2</sup>

The questionnaire was developed by the authors of this article, who have professional experience in the paediatrics and education fields, selecting by consensus items considered essential for the purpose of the study, and efforts were made to use simple language and avoid medical jargon.

The questionnaire was completed on a voluntary and anonymous basis by 244 teachers that attended the second and third conferences on the care of students with chronic diseases in the school setting organised by the Regional Ministry of Education, Culture and University Regulation of the Government of Galicia, held in November of 2017 and 2018, respectively.

The schedule of these conferences included three practical workshops on the immediate management of an anaphylactic reaction, an epileptic seizure and a hypoglycaemic episode, each of which was taught by a different paediatrician with specific experience on the disease in question. The respondents filled out the questionnaires before participating in these workshops.

## Results

**Table 1** presents the characteristics of the sample based on sex, age and years of professional experience. The majority of the sample consisted of women aged 40–50 years with a long career in teaching (10–20 years).

**Table 2** summarises the results of the survey. Of the total of 244 teachers that responded, 146 (59.8%) had students with chronic diseases in their classrooms, and epileptic seizures were the most common chronic condition in their students. The main concern of the teachers was not knowing how to respond in the event of a potentially serious situation, and only a minority (2.7%) focused on the potential legal ramification of their actions should they need to care for a student in their school.

When it came to epilepsy, 17.5% of teachers who had epileptic students reported having managed seizures at some point. In the event of a student developing convulsive seizures, most of the teachers (77.7%) responded that they would contact an emergency care team and follow their directions, and only 12.1% reported that they would be willing to use the prescribed medication from the outset, without the supervision of a health care provider.

As for hypoglycaemic episodes in diabetic children, most teachers of students with diabetes (85.3%) reported knowing that glucose and glucagon were available in their schools, but up to 64% would not act in the event of a hypoglycaemic episode until the emergency team arrived at the school or provided specific directions.

In the case of anaphylaxis, 93.3% of teachers with allergic students knew what an anaphylactic reaction is, and 87.9% knew about epinephrine pens and their availability in their schools. However, only 13.4% of teachers had witnessed anaphylactic reactions during their careers. Of all respondents, 83.9% stated that if they witnessed an anaphylactic reaction, they would call the medical emergency team and immediately administer intramuscular adrenaline.

**Table 2** also summarises the conditions that teachers consider necessary for them to be able to correctly manage children with chronic diseases, and the most frequently stated need (expressed by 48.7%) was to be able to get in touch with a physician at the time of the acute event.

Thirty-seven percent of teachers had witnessed cardiopulmonary resuscitation (CPR) being performed before, and 4% reported having personally been involved in the delivery of CPR manoeuvres. Also, 72% expressed willingness to initiate CPR if necessary.

## Discussion

It has been proven that children with chronic diseases face more difficulties in their schooling compared to their healthy peers,<sup>3</sup> which requires coordinated strategies from schools and medical emergency services to guarantee the safety and correct management of this population in the school setting. In this regard, the Department of Education of the Government of Galicia has launched the project "Estrategia de Convivencia Escolar" (Strategy for Harmonious Relations at School) with the aim of securing resources and developing protocols to improve training of teaching staff. This was the framework for the development of the aforementioned protocol for the management of students with chronic diseases by medical emergency and school-based services<sup>1</sup> that provides recommendations and directions to manage potentially serious situations that could emerge in the school setting, complementing the School Alert<sup>2</sup> programme of the Fundación Pública Urgencias Sanitarias de Galicia-061, a structured set of interventions aimed at optimising the immediate management of children aged 0–16 years enrolled in school or childcare services with chronic diseases that may be at risk of life-threatening events or decompensations.

For these plans to be successful, it is necessary to know the resources currently available to schools, the training on the subject previously received by teachers on staff, and the main concerns of teachers in regard to these situations. Our

**Table 2** Distribution of teachers with students that had chronic diseases ( $N = 146$ ) by disease. Main concerns and perceived needs of teachers regarding the management of a potentially serious situation for the student emerging in the school setting.

$N = 146$		$n$	%
Disease	Epileptic seizures	118	80.8%
	Diabetes	93	63.7%
	Severe allergy	100	68.5%
Main concern	Not knowing what to do	83	56.9%
	Causing additional harm	39	26.7%
	Not having necessary treatment available	15	10.3%
	Legal liabilities	4	2.7%
	Does not know/does not answer	3	2.1%
	Perceived needs	Be able to immediately get in touch with a physician to be given directions	56
	Having a source of information to consult quickly if necessary	25	17.1%
	Have available an individualised report on the child providing directions on what to do	25	17.1%
	Availability of first-aid kit including all the supplies needed to manage an emergency	11	7.5%
	Having a liability release document freeing the teacher from any legal repercussions in case errors are made	5	9%
	Does not know/does not answer	13	8.9%

study shows that most teachers feel insecure and anxious in the management of severe exacerbations of chronic diseases for fear of not knowing what to do or cause additional harm. We did not find an association between these concerns and the age or years of professional experience of the teachers, and they seem rather to be related to the lack of specific training on these diseases.

The notion of the teacher as an agent involved in managing the health of children with chronic diseases in the school setting is controversial. In fact, a growing number of professionals in different fields, such as teachers and health care workers, are demanding the hiring of school nurses to provide care on site to children with chronic diseases, arguing that teachers do not have either the skills or the duty to assume this responsibility. Some studies have demonstrated that the presence of a school nurse is associated with a decrease in the days of missed school and the risk of school failure in children with chronic diseases.<sup>4</sup> While some schools in Spain have nurses on staff, in some autonomous communities rulings have been passed that place the responsibility of managing children that experience decompensation at school on teachers, as occurred in September 2018 in Vigo, where a judge determined that “the tasks of monitoring and control are incumbent on any teacher in this situation [...] and they have [...] the duty to care and assist when a minor is within school bounds.”<sup>5</sup>

Which children may end up requiring immediate care at school in the event of acute decompensation?

Diabetes is a chronic disease the incidence of which has been increasing in recent decades.<sup>6,7</sup> Despite advances in treatment that have improved quality of life and glycaemic control in children, they still need to monitor their blood glucose levels during school hours and adjust the doses of

insulin and dietary supplements depending on the circumstances and are at risk of developing clinically significant low blood sugar levels during school hours. In our survey, only one fourth of teachers that reported having or having had diabetic students had witnessed a hypoglycaemic episode. Notwithstanding, most knew that glucagon was used to treat severe hypoglycaemia and had access to it in their schools (although during the workshops it became evident that they did not know how to administer this medication). These data contrast with those of a similar study recently conducted in Cadiz, in which only 6.4% of surveyed teachers reported that glucagon was included in the first aid supplies of their schools.<sup>8</sup>

According to the American Diabetes Association, professionals involved in the education of diabetic students must be knowledgeable about diabetes and be trained on the management of emergencies secondary to acute decompensation.<sup>9</sup> However, we found that teachers in our region had limited knowledge on the subject, and a study conducted in the Autonomous Community of Madrid in the 2014–2015 period found that one fourth of the diabetic children in the sample had needed to change their insulin dose schedule because the school would not cooperate in its administration.<sup>10</sup>

Epilepsy is a relatively frequent disease in the paediatric population.<sup>11</sup> These children, even if properly diagnosed and treated, may experience epileptic seizures during school hours requiring anticonvulsant treatment and clinical assessment.<sup>11</sup> In addition, children with epilepsy are more likely to have cognitive deficits, learning difficulties and behavioural disorders<sup>12–14</sup>.

Epileptic seizures generally cause considerable anxiety to witnesses, especially those who are not familiar with them, and this may lead to delayed or inadequate care. Our sur-

vey found that most teachers would wait for the arrival of the emergency medical team before administering an anticonvulsant, and the proportion that would administer the drug early was very small. A recent systematic review on the knowledge and attitudes of teachers about epilepsy that included 54 studies from different countries identified deficiencies in the training received by teachers on this chronic disease, which are associated with difficulties managing episodes in the school setting. The review included 7 intervention studies focused on improving the training of teachers in the management of epileptic seizures to increase their confidence and willingness to respond to such episodes after the training.<sup>15</sup>

More than half of the children aged 3–12 years enrolled in school in Spain have at least one of their meals at school.<sup>16</sup> It is estimated that up to 25% of first anaphylactic reactions occur in the school setting,<sup>17</sup> and the most severe reactions, as well as the largest proportion of deaths due to food allergy, also occur at school.<sup>18</sup> In addition, the use of school supplies that contain allergenic components puts children at risk of having anaphylactic reactions at school caused by triggers other than food. Of the diseases analysed in our study, anaphylaxis seemed to be the one that teachers were most familiar with, as approximately 60% had a student with severe allergy in their class, although few had witnessed an anaphylactic reaction at school. The latter may be the reason why teachers do not feel confident about managing such an event, a situation that has been described in the previous literature, for example, in surveys of teachers and carers in different schools in Italy, which also identified a significant lack of confidence on the part of the staff to manage food allergy in the students.<sup>19,20</sup> These findings underscore the need to develop strategies to train teachers on how to manage an anaphylactic reaction in the school setting, as the Sociedad Española de Inmunología Clínica, Alergología y Asma Pediátrica (Spanish Society of Paediatric Clinical Immunology, Allergology and Asthma, SEICAP) recently advocated.<sup>21</sup>

Despite the existence of systems such as the School Alert Programme, through which physicians in the emergency care coordination team can immediately access the health records of a child and offer precise and individualised directions to manage the patient, one of the main deficiencies perceived by the teachers that participated in our survey was not being able to reach a physician immediately. Thus, it would be worth exploring the barriers that teachers encounter when it comes to communicating with health care professionals. Teachers also want access to quick sources of information and documents specifying how to proceed in the event of a life-threatening emergency, which evinced a lack of awareness of currently existing protocols and guidelines established by the regional government or proposed by different scientific societies,<sup>1,2,22</sup> an indication that greater emphasis must be placed on promoting the development and implementation of educational strategies on the subject.

There are limitations to our study. Thus, the voluntary participation of teachers in the workshops and surveys may have resulted in selection bias. We also cannot rule out the possibility of biases related to the comprehension and interpretation of the items in the questionnaire.

## Conclusions

At present, more than half of the teachers in our region report having students with chronic diseases that may undergo a potentially severe decompensation in the school setting. These teachers worry that they may not know how to act in an emergency, and while in some cases they had been told which medication had to be administered and how, they did not feel confident enough to face this type of situation. Therefore, in addition to hiring onsite nurses as part of the school staff, we believe that it would be useful to implement training programmes to educate teachers on the management of the most frequent chronic diseases and their decompensation to increase their skills and confidence in managing children with chronic diseases in the school setting.

## Conflicts of interest

The authors have no conflicts of interest to declare.

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