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**Epilepsy Awareness, Knowledge and Attitudes among Secondary School
Teachers in Montenegro**

Свест, знање и ставови о епилепсији међу наставницима средњих школа у
Црној Гори

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Epilepsy Awareness, Knowledge and Attitudes among Secondary School Teachers in Montenegro

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SUMMARY

Introduction/Objective Epilepsy is associated with numerous misconceptions due to its dramatic manifestation and poor knowledge among the public.

The aim of this study was to assess epilepsy awareness, knowledge and attitudes among secondary school teachers.

Methods We conducted a cross-sectional survey by sending a simple self-administered questionnaire to all secondary schools in Podgorica. The questionnaire contained 16 questions regarding epilepsy awareness, knowledge and attitudes, first aid attitudes as well as demographic and teaching experience data.

Results We analyzed 219 questionnaires. Almost all teachers had heard or read about epilepsy, 57.5% of whom knew someone with epilepsy. 21% had a pupil with epilepsy in their class. More than 50% had witnessed a seizure with 25% of them linking epilepsy to a central nervous disturbance. Over 60% chose convulsions/shaking to be a major feature of an epileptic attack. 40% thought epilepsy could be cured. Almost 80% thought people with epilepsy should get married and have children, but only one third would marry a person with epilepsy. Over 13% would object their child playing with another child with epilepsy and more than 50% would object if their child married a person with epilepsy. About 35% of teachers suggested putting something in a person's mouth during attack to prevent tongue injury and aspiration.

Conclusion Awareness and understanding of epilepsy among teachers were satisfactory, but the results also revealed negative attitudes. Teachers need further education about epilepsy to increase seizure recognition and first aid management, reduce stigma and intensify acceptance of people with epilepsy.

Keywords: epilepsy; awareness; knowledge; attitudes; teachers; Montenegro

САЖЕТАК

Увод/Циљ Епилепсија је повезана са бројним заблудама које потичу од драматичног испољавања напада и слабог познавања природе болести.

Циљ рада је био да се процене свест, знање и ставови о епилепсији професора средњих школа.

Метод Спровели смо студију пресека у свим средњим школама у Подгорици употребом упитника којег су испитаници самостално попуњавали. Упитник је садржао 16 питања.

Резултати Анализирано је 219 упитника. Скоро сви наставници су знали или су читали о епилепсији. Више од половине (57,5%) је знало некога са епилепсијом, а 21% је имало ученика са епилепсијом у свом одељењу. Више од 50% професора је било очевидац напада. Епилепсију као болест централног нервног система је заокружило њих 25%. За преко 60% испитаника грчеви су били главна карактеристика напада. Мање од половине је мислило да епилепсија може да се излечи. Скоро 80% професора је било мишљења да оболели треба да склапају брак и имају децу, али само једна трећина њих би склопила брак. Преко 13% се не би противило да се њихова деца играју са дететом са епилепсијом, а више од 50% би се противило да њихово дете буде у браку са особом која болује од епилепсије. Око 35% наставника је предложило да се у нападу дјетету стави предмет у уста како би се превенирало западање језика.

Закључак Познавање епилепсије код наставника је било задовољавајуће, али су резултати указали и на негативне ставове. Наставнике треба додатно едуковати о епилепсији, повећати знање о нападима и првој помоћи нападу а у циљу смањења стигматизације и бољег прихватања особа са епилепсијом.

Кључне речи: епилепсија; свест; знање; ставови; наставници; Црна Горе

INTRODUCTION

Epilepsy is the most common neurological disorder, affecting over 50 million people worldwide [1]. Unfortunately, it is also poorly understood, even among those who know someone with epilepsy. Attitudes towards people with epilepsy are influenced by the degree of knowledge of the condition [2]; thus, in theory, a higher level of education should correlate with better awareness, knowledge and attitude regarding epilepsy. However, in reality, the general public frequently hold misconceptions and

inappropriate beliefs; this is especially the case among older and less educated members of a community but also occasionally among those with a university education. Mekarelli, Danesi as well as Hsieh and Chiou found such misconceptions among school teachers [3, 4, 5].

School is an important part of every child's life. It is a place where their psychological, social and educational development begins and it represents a basis for all future accomplishments. Children with epilepsy are particularly vulnerable at the time of puberty, when they might experience stigma, isolation and consecutive poor self-esteem. It is well established that children with epilepsy have a higher incidence of school underachievement as a result of many factors, including the seizures themselves, the medications, the psychosocial and behavioral difficulties [6].

Teachers are often seen as role models and their knowledge about and attitudes towards epilepsy can directly impact upon a child's school performance, social skills development [4] and reduction in stigma. Their experience through direct contact with other students can contribute to an improvement of epilepsy management and to their better surveillance and safety. Inadequate teacher's knowledge and negative attitudes can therefore have unforeseeable consequences.

Thus, we designed this study to evaluate the awareness, knowledge, attitudes to epilepsy, and attitudes to first aid among secondary school teachers in Podgorica (the capital of Montenegro) and to correlate these findings with social background and teaching experience.

METHODS

We conducted this cross-sectional study in Podgorica during April 2015. Podgorica is considered an educational center for the entire country, containing 10 of the fifty public secondary schools in Montenegro.

In this study, we included all teachers living in Podgorica, from nine secondary schools. We excluded teachers from one secondary school since this school was specifically designed for children with delay in mental development. Teachers who had children of their own with epilepsy were also excluded. We informed the directors of all secondary schools about the study, and obtained their approval beforehand. Teachers were asked to answer a 16-item questionnaire. Participation was voluntary and anonymous, and all teachers gave written informed consent.

The questionnaire comprised five parts: demographic data of teachers, teaching data, familiarity with epilepsy, understanding of epilepsy, attitudes towards epilepsy and attitudes towards first aid (Appendix 1). Most questions were designed as a choice from "yes", "no" or "not familiar with the disease", while questions regarding etiology of epilepsy, clinical manifestations of an attack and first aid management permitted multiple answers. The questions were derived from the questionnaires used in previous studies that quantified the knowledge, attitudes, and practice toward epilepsy among selected populations [7-10]. The questionnaire was translated into Montenegrin from the English version and went through translation and back-translation. Finally, the questionnaire was tested with lay volunteers to ensure simplicity of language.

Most of the questions in the returned questionnaires were answered. We discarded from the data analysis those questionnaires in which some or all of the questions in the returned questionnaire were left unanswered.

Statistical analysis

After coding, the data were entered into the computer using Excel Programme and analyzed by "Statistical Package for Social Sciences" (SPSS) 16.0 statistical software. (SPSS Inc., Chicago, IL). Continuous variables were expressed as the range and median, whereas categorical variables were presented as frequencies (%). We used chi-square (χ^2) test to examine the association between variable's absolute frequencies. When frequencies were less than 5, we applied Fisher's exact test. We used the T test to determine whether differences between means were statistically significant. We considered a p-value of <0.05 to be a statistically significant association between variables in all tests.

RESULTS

We sent a total of 279 questionnaires to all schools. Of those, 221 teachers responded (aged 24–65 years), with 219 questionnaires being accepted, thus giving a response rate of 78.5%.

Table 1 shows the socio-demographic background and teaching experience of participants. Their mean age was 43.38 ± 10.54 years (range 24–65 years). Most teachers were female (74.9%). Almost two-thirds were married (62.1%), predominantly women (75%). Over one third (36.1%) had fewer than 10 years of teaching experience. Male teachers were more likely to have fewer than 10

Table 1. Socio-demographic background and teaching data of teachers.

Characteristics	Teachers with students with epilepsy in their class (n=154)	Teachers without students with epilepsy in their class (n=65)	p-value	
Age (years)	44.88±10.39	39.83±10.13	0.001	
Gender (M/F)	40/114	15/50	0.78	
Marital status	Married	97 (63%)	39 (60%)	0.79
	Single	46 (29.90%)	24 (36.9%)	0.39
	Divorced	8 (5.2%)	2 (3.1%)	0.73
	Widow/ Widower	3 (1.9%)	0	0.56
Teaching experience	<10 years	48 (31.2%)	31 (47.7%)	0.03
	10–20 years	53 (34.4%)	20 (30.8%)	0.71
	> 20 years	53 (34.4%)	14 (21.5%)	0.06

years of teaching experience ($p < 0.02$), whereas female teachers were more likely to have between 10 and 20 years of teaching experience ($p = 0.005$). There were no statistically significant differences between age and marital status among interviewed teachers.

Almost all the teachers had heard or read about epilepsy (Q1, 97.7%). Female teachers were significantly more likely to have heard of this disease compared to male teachers (99.4% vs 92.7%, $p = 0.01$). Over half of those who had heard or read about epilepsy (Q2, 57.5%) knew someone with the disorder. Equal numbers of men and women provided positive answers to these questions (60.0% vs. 56.7%, $p = 0.67$). Just over one-fifth (Q3, 21%) had a pupil with epilepsy in their class. They were

more likely to be female teachers ($p=0.03$). Fewer than 7% (Q6, 6.4%) of all teachers believed epilepsy was a form insanity. There were no statistically significant differences between male and female teachers regarding this question ($p=0.11$). Almost 40% (Q7, 39.7%) of all teachers believed epilepsy could be cured, regardless of gender ($p=0.12$). Over 50% of teachers (Q8, 57.07%) had witnessed a seizure. Teachers aged over 45 years with over 10 years of experience ($p < 0.05$) answered this question positively. These results are shown in table 2.

Table 2. Teachers' answers in relation to gender.

Question	YES			p-value
	Total	Male	Female	
Have you ever heard or read about epilepsy?	214 (97.7%)	51 (92.7%)	163 (99.4%)	0.01
Did you ever know anyone who had epilepsy?	126 (57.5%)	33 (60%)	93 (56.7%)	0.66
Have you ever had any students with epilepsy in your classroom?	46 (21%)	9 (16.4%)	37 (22.6%)	0.03
Do you think that epilepsy is a form of insanity?	14 (6.4%)	6 (10.9%)	8 (4.9%)	0.11
Do you think that epilepsy can be controlled with medications?	87 (39.7%)	17 (30.9%)	70 (42.7%)	0.12
Have you ever seen anyone who was having a seizure?	126 (57.5%)	34 (61.8%)	92 (56.1%)	0.45
In your opinion, can people with epilepsy lead a normal life?	160 (73.1%)	40 (72.7%)	120 (73.2%)	0.93
In your opinion, should people with epilepsy get married?	174 (79.5%)	45 (81.8%)	129 (78.7%)	0.70
In your opinion, should people with epilepsy have children of their own?	161 (73.5%)	40 (72.7%)	121 (73.8%)	0.95
Would you marry a person with epilepsy?	76 (34.7%)	17 (30.9%)	59 (36%)	0.58
Would you mind your child playing with a child with epilepsy?	30 (13.7%)	6 (10.9%)	24 (14.6%)	0.37
Would you mind your child getting married to a person with epilepsy?	128 (58.4%)	26 (47.3%)	102 (62.2%)	0.05
Do you think people with epilepsy should be employed in jobs like other people?	193 (88.1%)	43 (78.2%)	150 (91.5%)	0.008

Most teachers (Q9, 73.1%) believed that people with epilepsy could lead as a normal life as everybody else. Over three-quarters (Q10, 79.5%) thought that people with epilepsy should get married and have children (Q11, 73.5%), but only one third of all teachers said they would marry a person with epilepsy (Q 12, 34.7%). Over 10% (Q13, 13.7%) would object if their child played with another child who had epilepsy, but more than a half (Q14, 58.4%) would object if their child married a person with epilepsy. Nearly 90% (Q15, 88.1%) thought people with epilepsy should be employed like everybody else. Female teachers were more likely to answer “yes” to this question compared to male colleagues (78.2% vs. 91.5%, $p=0.008$) (Table 2).

All teachers with over 10 years of experience had heard of epilepsy, unlike colleagues with fewer years in teaching. It was found that working experience was highly associated with the knowledge regarding this disorder ($p=0.01$). Teachers with over 10 years in training were significantly more likely to know someone with epilepsy, compared to colleagues with fewer than 10 years of working experience ($p = 0.02$). The least experienced teachers had fewer students suffering from

epilepsy. Teachers with 10–20 years' experience and in training ($p=0.006$) had significantly more students with epilepsy. Almost three-quarters (71.6%) of teachers with over 20 years in teaching had seen seizures, compared to 60% of those who had been teaching for 10–20 years. The likelihood of teachers having seen a seizure was significantly related to their teaching experience ($p=0.04$). Teachers with a long teaching career were more likely to object their child marrying a person with epilepsy ($p=0.02$). These results are shown in table 3.

Table 3. Teachers answers in relation to working experience.

Question	YES			p-value
	<10 years	10-20 years	>20 years	
Have you ever heard or read about epilepsy?	74 (93.7%)	73 (100%)	67 (100%)	0.01
Did you ever know anyone who had epilepsy?	36 (45.6%)	47 (64.4%)	43 (64.2%)	0.02
Have you ever had any students with epilepsy in your classroom?	8 (10.1%)	16(21.9%)	22 (32.8%)	0.006
Do you think that epilepsy is a form of insanity?	4 (6.4%)	8 (10.9%)	2 (4.9%)	0.13
Do you think that epilepsy can be controlled with medications?	27 (34.2%)	33 (45.2%)	27 (40.3%)	0.52
Have you ever seen anyone who was having a seizure?	35 (44.3%)	43 (58.9%)	48 (71.6%)	0.004
In your opinion, can people with epilepsy lead a normal life?	58 (73.4%)	51 (69.9%)	51 (76.1%)	0.70
In your opinion, should people with epilepsy get married?	65 (82.3%)	56 (76.7%)	53 (79.1%)	0.69
In your opinion, should people with epilepsy have children of their own?	60 (75.9%)	52 (71.2%)	49 (73.1%)	0.97
Would you marry a person with epilepsy?	32 (40.5%)	22 (30.1%)	22 (32.8%)	0.67
Would you mind your child playing with a child with epilepsy?	9 (11.4%)	11(15.1%)	10 (14.9%)	0.89
Would you mind your child getting married to a person with epilepsy?	40 (50.6%)	40 (54.8%)	48 (71.6%)	0.02
Do you think people with epilepsy should be employed in jobs like other people?	70 (88.6%)	63 (86.3%)	60 (89.6%)	0.26

Over 20% of teachers who worked less than 10 years and over 22% of them who worked more than 10 years were familiar with the cause of epilepsy ($p = 0.21$). The majority of teachers in both groups considered convulsions/shaking to be the major characteristic of an epileptic attack (79.7% and 87.1%, $p = 0.14$). Most respondents believed epilepsy was not a form of insanity (92.4% and 90.0%, $p = 0.55$). A third of the professors who worked less than 10 years (34.2%) and less than a half (42.9%) who worked more than 10 years believed epilepsy could be controlled with medication ($p = 0.20$). The frequency of correct answers presented in table 4 are not statistically significant in regard to working experience.

Table 4. Teachers answers in relation to working experience.

Question	YES		p-value
	<10 years	≥10 years	
What do you think is a cause of epilepsy?	16 (20.3%)	39 (22.2%)	0.21
What do you think an epileptic attack is?	63 (79.7%)	122 (87.1%)	0.14
Do you think that epilepsy is not a form of insanity?	73 (92.4%)	126 (90%)	0.55
Do you think that epilepsy can be controlled with medications?	27 (34.2%)	60(42.9%)	0.20

A quarter of all teachers from both groups (with and without students with epilepsy in the class) were familiar with a cause of epilepsy ($p=0.90$), naming brain disease/disorder/injury in a multiple-choice/single answer format. One fifth believed epilepsy was hereditary, and the rest thought seizures were caused by a combination of emotional stress, birth defects and hereditary factors. Majority of respondents from both groups considered convulsions/shaking to be a major feature of an epileptic attack (84.1% vs. 86.5%, $p=0.71$). Only 8.21% considered loss of consciousness as a feature, but 16% chose the combination of convulsions and loss of consciousness. Epilepsy was not considered as a form of insanity in a little over 90% of teachers who had students with epilepsy compared to a similar percentage of those who did not have a pupil with epilepsy in their class (91.2% vs. 89.3%, $p=0.69$). Less than a half of all teachers who had students with epilepsy thought epilepsy could be controlled with medication in contrast to one third of those who had no experience with students with epilepsy ($p=0.17$). These results are presented in table 5.

Table 5. Teachers answers in regard to their experience with students with epilepsy

Question	YES		p-value
	Teachers with students with epilepsy in their class	Teachers without students with epilepsy in their class	
What do you think is a cause of epilepsy?	46 (25.3%)	9 (24.3%)	0.90
What do you think an epileptic attack is?	153(84.1%)	32(86.5%)	0.71
Do you think that epilepsy is not a form of insanity?	166(91.2%)	33 (89.2%)	0.69
Do you think that epilepsy can be controlled with medications?	76 (41.8%)	11(29.7%)	0.17

Professors who had students with epilepsy more often thought people with epilepsy should get married (82.4% vs. 64.9%, $p=0.01$) and they would marry a person with epilepsy in contrast to their colleagues who were inexperienced (39% vs. 13.5%, $p=0.003$). Professors who never had a student with epilepsy in their class believed they should be employed in jobs like other people (78.4% vs. 62.5%, $p=0.04$). These results are presented in table 6.

Table 6. Teachers answers in regard to their experience with students with epilepsy

Question	Total	YES		p-value
		Teachers with students with epilepsy in their class	Teachers without students with epilepsy in their class	
In your opinion, can people with epilepsy lead a normal life?	160 (73.1%)	136 (74.7%)	24 (64.9%)	0.21
In your opinion, should people with epilepsy get married?	174 (79.5%)	150 (82.4%)	24 (64.9%)	0.01
In your opinion, should people with epilepsy have children of their own?	161 (73.5%)	138 (75.8%)	23 (62.2%)	0.08
Would you marry a person with epilepsy?	76 (34.7%)	71 (39%)	5 (13.5%)	0.003
Would you mind your child playing with a child with epilepsy?	30 (13.7%)	23 (12.6%)	7 (18.9%)	0.31
Would you mind your child getting married to a person with epilepsy?	128 (58.4%)	106 (58.2%)	22 (59.5%)	0.89
Do you think people with epilepsy should be employed in jobs like other people?	193 (88.1%)	164 (62.5%)	29 (78.4%)	0.04

Almost one third of interviewed (28.3%) professors knew how to perform proper first aid. One fifth of teachers (19.4%) who had students with epilepsy in their class encircled correct answer in regard to proper first aid management. One half of teachers who had previously seen an epileptic attack would provide proper first aid in a seizing child. Having a student with epilepsy ($p = 0.7$), long working career ($p = 0.69$) or being a witness of an epileptic attack ($p = 0.15$) are variables which were not statistically significant determinants in regard to first aid management. Correct answers were equally distributed in all three categories (Table 7). Incorrect first aid management included

Table 7. Proper first aid management in regard to determinants – having a student with epilepsy, being a witness of an epileptic attack and working experience.

Determinants	Proper first aid management (n=62)	Incorrect first aid management (n=157)	p-value
Professors who had students with epilepsy in their class	12 (19.4%)	34 (21.7%)	0.7
Professors who witnessed an epileptic attack	31 (50%)	95 (60.5%)	0.15
Teaching experience	<10 years	24 (38.7%)	55 (35%)
	10–20 years	18 (29%)	55 (35%)
	> 20 years	20 (32.3%)	47 (29.9%)

potentially dangerous activities, such as holding a student's arms and legs and pouring water on a student during an attack. Three teachers did not know what to do with a seizing student.

DISCUSSION

In the eyes of children, teachers are often seen as role models with a lifelong influence. Therefore, evaluating their knowledge and attitudes towards epilepsy is crucial, given that their values may directly impact not only on the children but on their families and communities. This study is the first survey regarding epilepsy awareness, knowledge and attitudes towards epilepsy among secondary school teachers in Montenegro.

In a present study, teachers had a good awareness of epilepsy. Only three professors had not heard or read about epilepsy. Female teachers were more aware, but we believe this result is related to a higher percentage of female teachers compared to male colleagues in all secondary schools. More than half had witnessed a seizure. Several studies from both developed and developing countries showed high awareness among public [11-14]. On the contrary, the awareness about epilepsy among schoolteachers in Thailand was only 57.8% [15]. The reason for this disparity is vague; still a close interpersonal relationship may be the attribute in our community. Teachers also held appropriate opinions about the nature of epilepsy, naming brain disease (25%), genetics (20%), birth trauma (5%) as potential causes of epilepsy. These results are not surprising given their level of education, but there are still persisting misconceptions. Although teachers had knowledge, it was stunning to find that over 8% of professors who had a student with epilepsy believed epilepsy to be a form of insanity. This misconception was present even in those teachers with greater years of teaching experience. Our result is more favorable compared to those from developing countries [15, 16]. However, surveys of public

awareness, knowledge and attitudes towards epilepsy from developed countries reported negative association between epilepsy and insanity [11, 12, 17]. Over 40% of our teachers who had students with epilepsy in their class believed epilepsy can be controlled with medication. In a study conducted among Italian school teachers, it was observed that 46.8% of the teachers believed that epilepsy was incurable [5], while a study conducted in Brazil showed a much greater percentage of teachers believing epilepsy can be treated (90%) [18]. Over 80% of the teachers (those with and those without students with epilepsy in their class) believed that convulsion/shaking is a major feature of an epilepsy attack, supporting the well-known misconception that ‘people with epilepsy shake’, even though a generalized tonic-clonic seizure is not the most prevalent seizure type.

In contrast to our study, previous similar studies from USA [19] and Greece [20] found positive attitudes towards students with epilepsy despite significant deficits in general knowledge. Over three-quarters of our teachers thought that people with epilepsy should get married and have children, although only one third of teachers who had student with epilepsy would marry a person with epilepsy. Over 10% of teachers who had a student with epilepsy in their class would object if their child played with another child who had epilepsy and strikingly 50% would object if their child married a person with epilepsy. Negative attitudes in regard to these questions were even higher among teachers who were inexperienced. In Italian study [5] that included 600 teachers from primary and secondary schools, it was found that 33% of teachers considered epilepsy a moderate-to-strong limitation for marriage and 24.6% for having children. In a study by Mielke et al. [16] 76% of teachers would marry an epileptic person and 82% of teachers would allow their child to play with an epileptic child. In a survey from Thailand, most teachers would allow their children to associate with a child with epilepsy but only 41.2% of teachers would allow marriage of their child with an epileptic [15].

Although teachers with over 20 years of experience had more knowledge and more students with epilepsy in their classrooms, it is evident that stigma had remained. These negative attitudes might be a result of the absence of educational programmes in epilepsy for teachers in Montenegro. Nevertheless, negative attitudes of Montenegrin teachers towards students with epilepsy might also be a reflection of what they grew up hearing in community.

Despite this negative attitude, most teachers believed that people with epilepsy could lead as normal a life as everybody else and that they should be employed like other people. We cannot explain this discrepancy.

In regard to first aid measures for a seizing student, less than 20% of teachers who had students with epilepsy in their class and one half of those who had previously seen an attack would turn a pupil on a side and try to prevent further injuries and aspiration. Our result is far more less favorable compared to a study conducted in Pakistan where almost 60% of teachers would turn a pupil on side and over 45% would prevent a tongue rolling back [21]. Over 20% of teachers who had students with epilepsy and over 60% of those who had previously seen an epileptic attack were not familiar with the correct initial procedures and first aid during a seizure. These teachers selected potentially dangerous

maneuvers, such as holding a student's arms and legs and pouring water on to them during an attack. Other studies found similarly unsatisfactory responses concerning first aid measures in children with epilepsy [5, 7, 15, 19, 20, 22, 23]. In undeveloped countries these percentages were even higher, like a study from Nigeria where over 80% of teachers were not familiar with first aid management of seizing child [8]. In Montenegro, paramedics are always called by a school staff in any case of emergency, especially seizures. This reflects the amount of panic which a seizure generates. One has to keep in mind that the injuries associated with a seizure are common among sufferers and their prevention as well as proper first aid are indispensable. Thus teacher education towards a proper first aid seizure management is crucial in eliminating obstacles associated with negative attitudes and fear.

CONCLUSION

The results of the study suggested that though there is a high degree of awareness among secondary school teachers in Montenegro, considerable misconceptions and negative attitudes about epilepsy still persist, despite the level of education of teachers. The major reason for this was insufficient knowledge about epilepsy and lack of education of secondary school teachers during their training. In Montenegro, there are officially no special curricula regarding the education of teachers about the nature of epilepsy, seizure recognition and first aid management.

We hope that this finding will lead to the inclusion of education about epilepsy in teacher training. Teachers remain an important link between students with epilepsy and the local community, making school less stressful and the community more tolerant for them. Nevertheless, well-informed teachers should be able to recognize all types of seizures, be better able to manage seizing students and should even be the first to report the disorder in those young people.

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