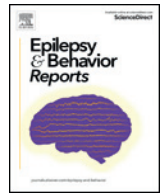




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Impact of epilepsy training on school teachers and counselors: An intervention study in Lebanon

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ABSTRACT

This study aimed to evaluate the immediate impact of an epilepsy training through the administration of a questionnaire (in Arabic) before and immediately after the intervention in Lebanese public and private schools. This project is part of an awareness campaign applied to 3 groups of teachers and counselors and consisted of a pre-test, a unified conference and a posttest. The statistical analysis used the McNemar and Stuart Maxwell tests (statistical significance level of 0.05). 73 participants completed the questionnaires. The majority were female (68.5%), aged less than 39 years (57%) and familiar with epilepsy. A positive impact of the training was found regarding the effect of epilepsy on schooling, seizures manifestations, psychological effects, seizure first aid and the possibility of curing epilepsy with surgery. Most of our participants recognized that children with epilepsy have a comparable IQ to others. They did not exhibit a discriminatory attitude against people with epilepsy in terms of the direct attitude towards them, employment or marriage. This is one of few studies done worldwide demonstrating an immediate positive effect of epilepsy training among school teachers. Future research should be undertaken to develop robust training models to destigmatize epilepsy.

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1. Introduction

Although there are no formal epidemiological studies regarding epilepsy in Lebanon, the World Health Organization reports that 7 to 14 persons out of 1000 suffer from epilepsy in countries with moderate or low income [1]. Seizure onset occurs before the age of 5 in 30% of cases, making epilepsy the most frequent neurological condition encountered by school professionals [2–4], though most people are poorly informed.

Epilepsy can affect learning through different mechanisms, including cognitive or behavioral dysfunction (directly or indirectly linked to the seizure onset zone); memory or concentration issues (secondary to seizures or medications); and associated comorbidities, including psychosocial comorbidities, learning disabilities or attention deficit disorder [2,3,5–9]. Learning difficulties can also be influenced by the teacher's low expectations, and the rejection by teachers or parents along with the low self-esteem of the child [10]. Moreover, school teachers are often poorly educated regarding sports activities in students with epilepsy. It is crucial to instruct them about the benefits of

physical activities in this case in order to improve seizure control and global wellbeing.

Various studies done in numerous settings and countries looking at attitudes and knowledge of school personnel towards epilepsy have demonstrated a lack of information in multiple fields [3,11–17]. Goel et al. [14] showed a globally an immediate and sustained (3 months after the intervention) positive impact of a workshop for 85 teachers in India, but stressed on the importance of repeat interventions to maintain long term effects. In Italy, a questionnaire survey undertaken to assess the impact of a nationwide educational campaign among 582 primary school teachers showed a decrease in the number of those who believed that epilepsy is incurable and limits employment, no change in the number of people who believe that epilepsy limits procreation, and an increase in those who think that it limits recreational activities and sports [18]. Upon retesting of 317 teachers after 3 months using the same questionnaire, the number of “don't know” answers decreased significantly for almost all questions, but this was not the case for negative attitudes. The same held true for teachers believing that epilepsy is a source of learning disability and social disadvantage [19].

There is also poor knowledge and awareness about epilepsy in the Lebanese community. Our team undertook a study in 2010 to look at attitudes, knowledge and practices of the Lebanese population (145 participants) towards epilepsy compared to those of a medical group (75

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health professionals). At that time, a specific questionnaire was validated in Arabic and given to participants [20]. It exposed some misconceptions and stigmatization features regarding epilepsy in our society, mostly in the general population; consequently, awareness campaigns in the country at different levels were felt needed. Therefore, an awareness campaign was launched in Lebanon by Epsilon, a social and medical association for epilepsy in collaboration with the Ministry of Education in 2018.

The main goal of our study was to evaluate the direct impact of a training course regarding epilepsy in public and private schools in Lebanon using a specific questionnaire on the attitude and knowledge of school teachers and instructors before and after the intervention.

2. Methods and results

This project is part of an awareness campaign for epilepsy in Lebanon in collaboration with the Ministry of Education in Lebanon. The main objective was to provide teachers and counselors in Lebanese public and private schools the opportunity to acquire the knowledge, skills and attitudes needed to safely and effectively assist and follow a child with epilepsy.

The purpose was also to study the immediate impact of a training course through administration of the questionnaire before (pretest) and after (posttest) the intervention.

2.1. Planning of intervention and sample population

The appointments were organized in advance, taking into account the schedule of each group, and the conference was given over a duration of 90 min (short duration group or SD) or 210 min including a coffee break (extended duration group or ED).

Three groups of participants were selected in order to include teachers and health counselors from public and private schools in different regions:

- 1 - A group of health counselors from public schools in Lebanon from different regions of the Lebanese territory (ED Group)
- 2 - A group of teachers and counselors from a private college in the suburbs of Beirut (ED Group)
- 3 - A similar group from a public school in the south of Lebanon (SD Group).

The training was developed and given by the authors using a unified Powerpoint presentation on epilepsy (including its causes, types, triggers, diagnosis and treatment) and audiovisual material with flyers and videos (seizures and the do's and don't's in case of a seizure). Prior approval was obtained from the Ethics Committee of Saint Joseph University (Number USJ-2018-106). Permission to pass the questionnaires was obtained from the schools' principals or public sector officials, and participants were asked to complete the preintervention and postintervention questionnaires anonymously.

2.2. The questionnaire

The questionnaire was adapted from a previously used questionnaire [20] validated in Arabic.

The questionnaire was given both pre- and postintervention. The first part of the questionnaire included general and sociodemographic characteristics of the participants: age, gender, educational level, school profession, marital status, type of school (public/private), region, and years of experience.

The second part consisted of 21 questions regarding the attitudes and practices of the population towards epilepsy, covering familiarity with epilepsy, general knowledge and social attitude towards people and students with epilepsy.

The answers were yes or no and multiple choice.

At the end of the posttest, participants were asked to give their feedback through 2 questions: the first was whether the intervention was useful, and the second was an open question with suggestions. The data were entered into an Excel sheet.

2.3. Statistical analysis

The results were analyzed by comparing pretest and posttest data. The tests used for paired categorical data (prepost) were the McNemar test for binary variables and the McNemar–Bowker test and Stuart–Maxwell test (marginal homogeneity test) for paired nominal variables with more than 2 categories. All the statistical tests were two-sided, and the statistical significance level was 0.05. Statistical calculations were run on SPSS (IBM Corp. Released 2013, SPSS Statistics for Windows Version 22.0, Armonk, NY).

3. Results

3.1. Sociodemographic characteristics

In total, 73 participants were retained. The majority were females, aged less than 39 years, married and holding a university degree with a mean of 13 teaching years (SD of 8.6) (Table 1).

3.2. Familiarity with epilepsy

The majority of the participants (98.6%) had heard about epilepsy, with 6.8% admitting knowing a person who suffers from it. After the intervention, this percentage rose significantly to 17.8%, probably since more people recognized the condition or accepted it. Approximately one-third admitted having witnessed a seizure with loss of consciousness and 17.8% with tongue biting and abnormal movements.

3.3. Knowledge about epilepsy

The majority recognized that it is a brain disease (91.8%) that is non-contagious (98.6%), and none considered that it is a madness or

Table 1
Sociodemographic characteristics of the participants.

Sociodemographic characteristics	No. of participants (n = 73)	Percentage (%)
Age (years)		
18–39	41	56.9
40–59	27	37.5
60 and more	4	5.6
Gender		
Male	23	31.5
Female	50	68.5
Marital Status		
Single	15	20.5
Married	55	75.3
Widow	2	2.7
Divorced	1	1.4
School category		
Public	37	50.7
Private	36	49.3
Region		
Beirut	12	16.7
Mount Lebanon	28	38.9
Beqaa	1	1.4
South	26	36.1
North	4	5.6
Other	1	1.4
Education level		
High School Diploma	7	10
Bachelor's degree	39	55.7
Master's degree	22	31.4
Doctoral degree	0	0
Other	2	2.9

demonic possession. On the other hand, there was a significant gain of information after the intervention among people who answered they did not know the cause of epilepsy (8.2% vs 0%). When asked about etiologies, 84.9% replied that the cause is a brain disorder, 11% a congenital cause, 23.3% a hereditary cause, 9.6% a mental retardation and 6.8% responded that they did not know. Also, there was a gain in information about the clinical manifestations of seizures when comparing pre- and postintervention outcomes: 34.3% initially believed that all epileptic seizures are accompanied by loss of consciousness vs 17.8% after ($p = .0013$). There was also a tendency to have a better recognition that behavioral disorders may be due to epilepsy (84.5% in post vs 67.7% in pre-intervention, $p = .052$).

3.4. Attitudes towards children with epilepsy

The majority of the responses were positive showing no discrimination against children with epilepsy and their schooling even before the intervention. Most of the participants recognized that children with epilepsy have a comparable IQ to others, and that epilepsy does not limit sports and recreational activities (Table 2).

3.5. Seizure first aid practices

The majority felt it was necessary to transfer the child to the hospital when the seizure lasts more than 5 min. After the training course, most of the participants recognized the necessity of clearing sharp objects away from someone having a seizure and not forcing something into his mouth (Fig. 1).

3.6. Awareness issues

Part of the questionnaire focused on awareness issues such as the possibility of curing epilepsy with surgery, social attitudes towards epilepsy and the perception of stigma. The possibility of curing epilepsy with surgery was clearly communicated to the participants (Fig. 2).

Addressing social attitudes towards epilepsy and stigma, responses were globally homogenous and positive. If they had epilepsy, one-third of teachers admitted that they would tell their loved ones, and 47% would tell everyone/anyone. Most of the participants did not exhibit a discriminatory attitude against people with epilepsy in terms of the direct attitude towards them or employing them. (Table 3).

Table 2

Attitudes towards children with epilepsy, their schooling and their participation in sports activities before and after the training course^a.

	Pre n (%)	Post n (%)	P-value
Is the IQ of epilepsy patients lower than general population?			
No	55 (78.60)	63 (86.30)	0.096
Yes, lower	1 (1.40)	8 (11)	0.039
Yes, much lower	0 (0)	1 (1.40)	–
I don't know	14 (20)	1 (1.40)	0.001
Is a specialized school necessary?			
No	53 (72.60)	61 (83.60)	0.041
Yes	4 (5.50)	8 (11.00)	
I don't know	16 (21.90)	4 (5.50)	
Do you think epilepsy limits sports and recreational activities?			
No	57 (78.10)	66 (90.40)	0.007
Yes	3 (4.10)	6 (8.20)	
I don't know	13 (17.80)	1 (1.40)	

(–) Statistical comparison not applicable.

^a The formal McNemar–Bowker or the Stuart–Maxwell tests could not be performed on the variables because there were categories with zero frequencies. The original variables were split into -n- binary variables (where n is the number of categories of the original variable) and the answers compared using the McNemar binary test for each category.

3.7. Effects of the duration of the training course

We were interested in looking at whether the immediate effect of the training was more significant in the ED group compared to the SD group (Table 4). In fact, there was a statistically significant difference in favor of the ED group regarding:

- Higher proportion of participants recognizing that absence seizures if recognized might not affect learning significantly if they were in the ED group vs SD group ($p = .008$).
- Better effect in the ED group at recognizing that seizures do not always involve loss of consciousness ($p = .039$).
- More people in the ED group answered that people can sometimes be cured from epilepsy completely ($p = .002$).
- Positive effect regarding the need to place children with epilepsy in specialized schools ($p = .038$).

The remainder of answers for these questions were unaffected by the duration as well as all other questions.

3.8. Evaluation of the training course

Finally, the last part of the posttest consisted of an evaluation of this intervention by a simple question: the majority of the participants (71/73 or 97.3%) found that the training was useful. Two people did not answer this question.

Several added free comments, summarized as the need to repeat similar and continuous training, share it with students and their families, cooperate with the ministries of health and education and general acknowledgments and thanking comments.

4. Discussion

The role of teachers remains important in every community; given the prevalence of epilepsy [1,2] but remains a taboo subject. It is fundamental that their knowledge of epilepsy be sufficient enough to support and better guide the affected students. Jones et al. [21] recently published a comprehensive review of all publications on this topic from 2000 to 2017. They identified 54 studies in 27 countries involving 17,256 participants. The review included 7 studies that assessed participants before and after the intervention. The authors concluded that few studies used a valid instrument and that a lack of knowledge and negative attitudes were unanimous in all studies; teachers had negative attitudes about children's participation in sports, and there was a lack of information about how to deal with seizures.

Our study evaluated the direct impact of training on epilepsy in Lebanese schools, and the results will be discussed in terms of their importance and impact.

A direct effect of the training was well demonstrated in this study at multiple levels where pre- and post-training results were significant (P value $< .05$). There was added understanding of the effect of epilepsy on schooling and more knowledge regarding the manifestations of epileptic seizures and their psychological or behavioral effects.

One of the ultimate goals of this training and the campaign launched by Epsilon was to destigmatize epilepsy and improve the management of this condition, but it was especially important to correct false beliefs and prejudices deep-rooted in people's thinking. One of the most important misconceptions to change was the universal belief that the patient can "swallow his tongue" during a seizure. The percentage of teachers who answered they would put something in the mouth during a seizure was much higher (64.4% in our group) than other countries, such as Germany [22] (13%) and Italy [18] (27%). Our results show that our intervention in schools was successful in changing these false convictions (Fig. 1).

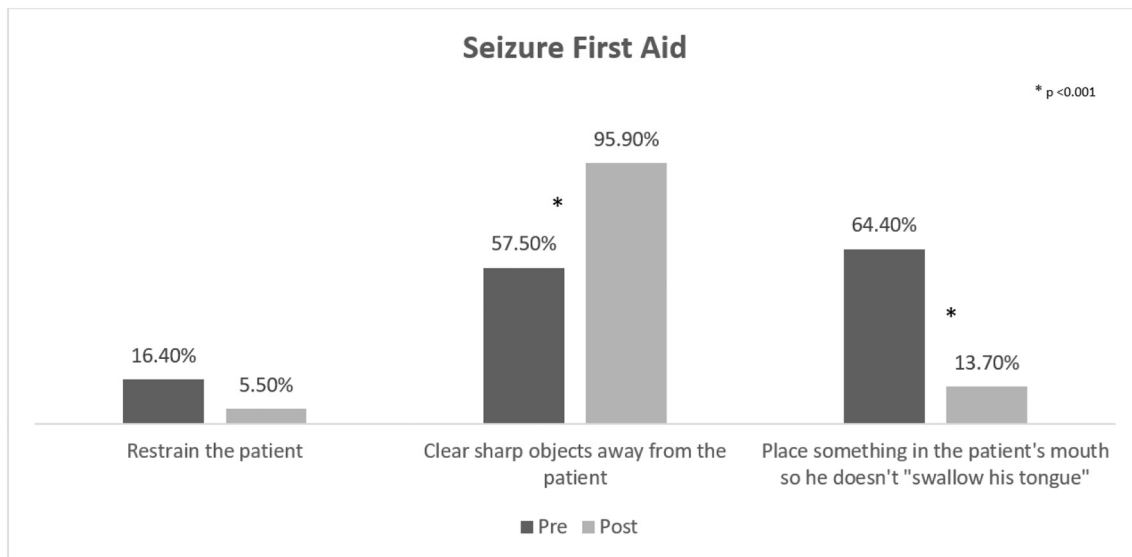


Fig. 1. General knowledge of seizure first aid before and after the training course.

Information about the possibility of curing epilepsy through surgery has also been clearly demonstrated (Fig. 2), with higher benefit in the ED group compared to the SD group ($P = .02$). One could speculate that the complexity of this topic would require more examples given and more time for better understanding. This could also explain why the participants who attended the ED intervention had a better understanding of absence seizures. They recognized that absence seizures, if detected and treated, would not have a major impact on learning (Table 4).

In general, teachers' attitudes improved after the retest, with a clear reduction in the number of those who answered "I don't know" and a shift to a positive attitude, particularly regarding curing epilepsy by surgery (Fig. 2). This effect was also shown when they were questioned about the etiologies or attitudes towards children with epilepsy, the need for special schooling or restriction of sports activities (Table 3). These findings satisfied the main purpose of this study: decreasing stigmatization of epilepsy in schools.

Regarding the influence of a longer duration of training, no significant difference was found between a longer and a short training as

regards to familiarity with epilepsy and social attitudes. Each has advantages and disadvantages, as discussed above.

Overall, our population showed reasonable knowledge, especially with regard to the cause of epilepsy and noncontagiousness compared to other populations, such as in Zambia or Khartoum [15,17]. Despite the fact that teachers from Zambia recognized epilepsy as a brain disorder, 17% believed in spiritual possession, and some referred to a spiritual healer. In Sudan (Khartoum), this percentage was even higher, at approximately 21% [17]. None of our participants believed in magic or spirituality in epilepsy. Comparing these results to the data from our previous Lebanese study [20], we found that the general population group in the previous study was less informed, as 6.3% thought that epilepsy was a kind of insanity, and 7% attributed spiritual dimensions to epilepsy. This gap may be due to better current information about epilepsy, the fact that teachers are generally more educated than the rest of the population or may simply be coincidental.

In the Egyptian study [23], 58% of public school teachers believed that children with epilepsy had mental retardation, which contrasts with our results. This demonstrates better information and acceptance

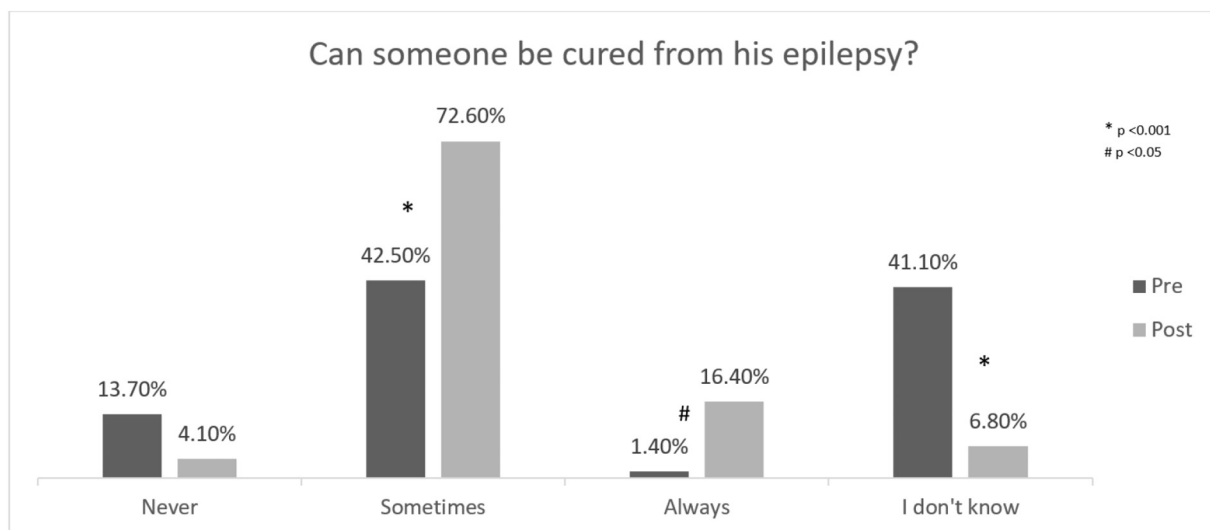


Fig. 2. Answers regarding the possibility of a cure for epilepsy before and after the training course.

Table 3
Attitudes towards others with epilepsy before and after the training course^a.

	Pre n (%)	Post n (%)	P-value
How would you react if you learned that someone you know or teach has epilepsy?			
<i>Treat as before</i>	62 (87.3)	70 (97.2)	0.021
<i>Prefer avoidance</i>	2 (2.8)	2 (2.8)	0.999
<i>Avoidance</i>	1 (1.4)	0 (0)	–
<i>I don't know</i>	6 (8.5)	0 (0)	–
Would you accept that you or any of your children marry someone who has epilepsy?			
<i>Yes, easily</i>	22 (32.80)	28 (39.40)	0.014
<i>Yes, but with some hesitation</i>	18 (26.9)	20 (28.20)	
<i>Yes, but with a lot of hesitation</i>	11 (16.40)	8 (11.30)	
<i>I would avoid it or refuse it</i>	16 (23.90)	15 (21.10)	
Would you hire someone who has epilepsy knowing that he has all the skills and qualifications needed for this job?			
<i>Yes, easily</i>	44 (60.3)	51 (69.9)	0.065
<i>Yes, under certain conditions</i>	23 (31.5)	23 (31.5)	0.999
<i>Yes, but with a lot of hesitation</i>	1 (1.4)	0 (0)	–
<i>I would avoid it</i>	0 (0)	0 (0)	–

(–) Statistical comparison not applicable.

^a The formal McNemar–Bowker or the Stuart–Maxwell tests could not be performed on the variables because there were categories with zero frequencies. The original variables were split into -n- binary variables (where n is the number of categories of the original variable) and the answers compared using the McNemar binary test for each category.

of children with epilepsy in Lebanon, with the majority of teachers declaring that a child with epilepsy has a comparable IQ to others (78.6% before training vs 86.3%).

Only 6.8% of the participants mentioned having seen a seizure as compared to a much higher percentage in Egypt (19.6%) [23]. However, 7% of the participants admitted to having a relative with epilepsy before training and 18% after (similar to the Jordanian group [24]), probably because some people better identified or categorized the symptoms of their relatives after the conference, or they felt more comfortable to report it after the training.

Teachers' attitudes towards children and their schooling were similar to the medical group of our previous Lebanese study and were far from the discriminatory attitude of the general population group (43.4% preferred children with epilepsy to be in special schools). The overall social attitude of our population was not discriminating against pupils with epilepsy and was similar to the results of the Italian study by Mecarelli et al. [18]. However, 24% would avoid or refuse to marry someone with epilepsy, and this attitude did not change much after the training (24% pre vs 21% post). They were more tolerant compared to the general population group we surveyed previously, where 31% agreed to hire people with epilepsy and half avoided marrying them [20].

The strength of our study is that it is one of few studies worldwide, and to our knowledge is the first in Lebanon and the Arab world, to look at the immediate effect of an educational training on epilepsy in a fairly representative sample of teachers and school counselors from urban and rural areas. We would like to emphasize that Arabic was the language adopted for the training and the questionnaires.

On the other hand, we recognize that our study has certain limitations. First, the majority of our participants was females, who generally tend to be less discriminating against epilepsy, as shown in our previous study or in the Egyptian study [20,23]. A second limitation includes the absence of a control group.

Another limitation is that the opinion of a sample does not reflect the opinion of all teachers in Lebanon; therefore, it will be necessary to undertake further studies including all regions and cities of Lebanon to obtain a more representative sample. The SD group was a homogeneous group from a public school in south Lebanon. It would be interesting in the future to compare it to another urban group and check if the results will defer according to the selected groups or duration of training.

Additional remote assessment would also be useful to assess long term effects.

Regarding the measurement tool or the questionnaire used, this is a questionnaire that is not directly supervised; thus, some answers could have been biased or influenced by the will to reply with better socially accepted answers.

Another possibility to improve this training is to provide more time or designing it as a workshop with additional interactions with participants.

Finally, it would be interesting for the trainers and participants to have a shorter session focused preferentially on the surgical treatment of epilepsy, which had a better impact in the ED group. This could be part of an awareness campaign directed to the population at large and will need to be tested and verified in the future.

5. Conclusion

The teachers and counselors evaluated were familiar with epilepsy and tolerant towards people with epilepsy, however, they had gaps and misconceptions in essential knowledge, mostly regarding treatment and seizure first aid.

Designing and implementing this intervention succeeded in filling these gaps and therefore addressed the needs of this population. The pre- and post-training questionnaire proved to be a good tool for measuring the impact of this training, which overall demonstrated a positive result. The learners unanimously found it useful and were interested in continuous education and sharing the information with students and their families.

Knowledge and attitudes can be enriched by interventions such as ours, but future research should be undertaken to develop more robust training models. Finally, we hope that by developing such

Table 4
Comparison between answers of the extended duration (ED) and the short duration (SD) groups before and after the training course.

	Pre n (%)		Post n (%)		P-value	
	ED n = 52	SD n = 21	ED n = 52	SD n = 21	ED	SD
What types of seizure can have a major impact on learning?						
<i>Tonic-clonic seizures</i>	31 (59.62)	15 (71.43)	46 (88.46)	14 (66.67)	0.001 ^a	0.999 ^a
<i>Partial seizures</i>	9 (17.31)	3 (14.28)	8 (15.38)	3 (14.28)	0.999 ^a	0.999 ^a
<i>Absence seizures</i>	25 (48.07)	3 (14.28)	13 (25.00)	6 (28.57)	0.008 ^a	0.375 ^a
A seizure always leads to a loss of consciousness.						
<i>True</i>	14 (28.57)	9 (50.00)	6 (12.24)	6 (33.33)	0.039	0.375
<i>False</i>	35 (71.43)	9 (50.00)	43 (87.76)	12 (66.67)		
Can someone be cured from his epilepsy?						
<i>Never</i>	6 (11.54)	4 (19.05)	1 (1.92)	2 (9.52)	0.125 ^a	0.625 ^a
<i>Sometimes</i>	24 (46.15)	7 (33.33)	41 (78.85)	12 (57.14)	0.002 ^a	0.125 ^a
<i>Always</i>	1 (1.92)	0 (0.00)	11 (21.15)	1 (4.76)	0.006 ^a	–
<i>I don't know</i>	21 (40.38)	9 (42.86)	0 (0.00)	5 (23.81)	–	0.125 ^a
Do children with epilepsy need to be placed in specialized schools?						
<i>Yes</i>	1 (1.92)	3 (14.29)	4 (7.69)	4 (19.05)	0.038	0.721
<i>No</i>	40 (76.92)	13 (61.90)	47 (90.38)	14 (66.67)		
<i>I don't know</i>	11 (21.15)	5 (23.81)	1 (1.92)	3 (14.28)		

(–) Statistical comparison not applicable.

^a The formal McNemar–Bowker or the Stuart–Maxwell tests could not be performed on the variables because there were categories with zero frequencies. The original variables were split into -n- binary variables (where n is the number of categories of the original variable) and the answers compared using the McNemar binary test for each category.

educational campaigns, we will be able to ban the stigmatization of epilepsy and improve the quality of life and school integration of affected individuals.

Declaration of competing interest

The authors have no conflicts of interest to disclose.

Acknowledgement

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Ethics

Ethical committee of Saint Joseph University approved the study (number 2018-106). Letter and required information were sent to directors of all schools prior to intervention as well as the Lebanese ministry of education.

Appendix A. Post test in arabic.

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ebr.2020.100365>.

References

- [1] WHO. The global burden of disease: 2004 update [Internet]. WHO. [cited 2019 Mar 26]. Available from: https://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/.
- [2] Russ SA, Larson K, Halfon N. A national profile of childhood epilepsy and seizure disorder. *Pediatrics*. 2012 Feb;129(2):256–64.
- [3] Wodrich DL, Jarrar R, Buchhalter J, Levy R, Gay C. Knowledge about epilepsy and confidence in instructing students with epilepsy: teachers' responses to a new scale. *Epilepsy Behav EB*. 2011 Feb;20(2):360–5.
- [4] Phelps L. Chronic health-related disorders in children: Collaborative medical and psychoeducational interventions. American Psychological Association; 2006 344 pp.
- [5] Baker GA, Jacoby A, Buck D, Stalgis C, Monnet D. Quality of life of people with epilepsy: a European study. *Epilepsia*. 1997 Mar 1;38(3):353–62.
- [6] Luoni C, Bisulli F, Canevini MP, De Sarro G, Fattore C, Galimberti CA, et al. Determinants of health-related quality of life in pharmacoresistant epilepsy: results from a large multicenter study of consecutively enrolled patients using validated quantitative assessments. *Epilepsia*. 2011 Dec;52(12):2181–91.
- [7] Reilly C, Atkinson P, Das KB, Chin RFMC, Aylett SE, Burch V, et al. Neurobehavioral comorbidities in children with active epilepsy: a population-based study. *Pediatrics*. 2014 Jun;133(6):e1586–93.
- [8] Reilly C, Ballantine R. Epilepsy in school-aged children: more than just seizures? *Support Learn*. 2011;26(4):144–51.
- [9] Black KC, Hynd GW. Epilepsy in the school aged child: cognitive-behavioral characteristics and effects on academic performance. *Sch Psychol Q*. 1995;10(4):345–58.
- [10] Fernandes PT, de Souza EAP. Perception of epilepsy stigma in fundamental school teachers. *Estud Psicol Natal*. 2004 Apr;9(1):189–95.
- [11] Eze CN, Ebuehi OM, Brigo F, Otte WM, Igwe SC. Effect of health education on trainee teachers' knowledge, attitudes, and first aid management of epilepsy: an interventional study. *Seizure - Eur J Epilepsy*. 2015 Dec 1;33:46–53.
- [12] Bishop M, Boag EM. Teachers' knowledge about epilepsy and attitudes toward students with epilepsy: results of a national survey. *Epilepsy Behav*. 2006 Mar 1;8(2):397–405.
- [13] Bishop M, Slevin B. Teachers' attitudes toward students with epilepsy: results of a survey of elementary and middle school teachers. *Epilepsy Behav*. 2004 Jun 1;5(3):308–15.
- [14] Goel S, Singh N, Lal V, Singh A. Evaluating the impact of comprehensive epilepsy education programme for school teachers in Chandigarh city, India. *Seizure - Eur J Epilepsy*. 2014 Jan 1;23(1):41–6.
- [15] Birbeck GL, Chomba E, Atadzhanov M, Mbewe E, Haworth A. Zambian teachers: what do they know about epilepsy and how can we work with them to decrease stigma? *Epilepsy Behav EB*. 2006 Sep;9(2):275–80.
- [16] Kaleyias J, Tzoufi M, Kotsalis C, Papavasiliou A, Diamantopoulos N. Knowledge and attitude of the Greek educational community toward epilepsy and the epileptic student. *Epilepsy Behav EB*. 2005 Mar;6(2):179–86.
- [17] Elhassan MA, Alemairy AA, Amara ZM, Hamadelneel AA, Mohamed AH, Elaimeri AA. Epilepsy: knowledge, attitude, and practice among secondary school teachers in Khartoum state. *Neurol Ther*. 2017 Oct 23;6(2):225–35.
- [18] Mecarelli O, Messina P, Capovilla G, Michelucci R, Romeo A, Beghi E, et al. An educational campaign toward epilepsy among Italian primary school teachers: 1. Survey on knowledge and attitudes. *Epilepsy Behav*. 2014 Mar 1;32:84–91.
- [19] Mecarelli O, Messina P, Capovilla G, Michelucci R, Romeo A, Beghi E, et al. An educational campaign about epilepsy among Italian primary school teachers. 2. The results of a focused training program. *Epilepsy Behav*. 2015 Jan;42:93–7.
- [20] Abou Khaled Karine and El Chaar Rouba. Stigma and attitudes towards epilepsy in a selected Lebanese population. AES meeting, abstract, 2011.
- [21] Jones C, Atkinson P, Helen Cross J, Reilly C. Knowledge of and attitudes towards epilepsy among teachers: a systematic review. *Epilepsy Behav*. 2018 Oct;87:59–68.
- [22] Jansen P, Neininger MP, Bernhard MK, Kiess W, Merckenschlager A, Bertsche T, et al. Knowledge and attitudes about epilepsy: a survey of high school students in Germany. *Seizure*. 2017 Oct 1;51:139–44.
- [23] Shehata GA, Mahran DG. Knowledge, attitude and practice with respect to epilepsy among school teachers in Assiut city. *Egypt Epilepsy Res*. 2010 Dec;92(2–3):191–200.
- [24] Alkhamra H, Tannous A, Hadidi M, Alkhatteeb J. Knowledge and attitudes toward epilepsy among school teachers and counselors in Jordan. *Epilepsy Behav*. 2012 Aug;24(4):430–4.