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# Evaluating the impact of comprehensive epilepsy education programme for school teachers in Chandigarh city, India



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## ABSTRACT

**Purpose:** School teachers can play a key role in the first-aid management of school children experiencing a seizure. The teachers have a pivotal role in disseminating knowledge to the children of diseases experienced by them and developing positive attitudes among the children regarding the diseases. The present study investigated the knowledge and practices used by teachers to manage epileptic seizures. The study also tested an epilepsy intervention educational package to see whether it improved the knowledge and practices of the teachers regarding epilepsy.

**Methods:** A total of 85 teachers in schools from Chandigarh, a city of northern India, participated in the study. At the start of the study the teachers completed a pre-tested, semi-structured questionnaire on the first-aid management of epileptic seizures. They were then presented with an intervention package that included audio-visual material on basic aspects of epilepsy. The teachers were then retested after the intervention (one immediately and another after three months from the intervention). A scoring system was devised to quantify the knowledge, attitude and skills of teachers.

**Results:** More than 90% of the teachers had previously either heard or read about epilepsy. Nearly half of the teachers said that books and magazines were the most common source of their information, followed by the internet. A comparison of the knowledge, attitudes and skills about the first-aid management of epilepsy based on the before and after questionnaire scores showed significant improvements in the various domains ( $p < 0.05$ ).

**Conclusion:** The epilepsy intervention educational package provided a positive, short term, impact on the knowledge and skills of teachers about epilepsy. There is a need for regular workshops to improve and reinforce the knowledge and skills of the teachers about health problems like epilepsy.

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## 1. Introduction

Epilepsy accounts for one per cent of the global burden of disease; however, 80% of the burden of epilepsy is in the developing countries.<sup>1</sup> Epilepsy is a condition of chronic, recurring seizures and its most disabling aspect is unpredictability of when and where the next seizure will occur. This common disease carries a great social stigma, and the resulting discrimination is often more harmful and devastating than the disease itself.<sup>2</sup>

Social discrimination against people with epilepsy is largely due to misconceptions about the disease, and the horror that strikes

members of the public when confronted by the frightening sight of a person suffering a seizure. Periodic nationwide polls in developed countries like United States and Denmark have, with time, observed improved public attitudes and a greater understanding of epilepsy due to increasing public awareness and education.<sup>3–5</sup>

This does not seem to be the case with developing countries like India where public education takes a back seat. A variety of inappropriate and even harmful seizure-control practices are often adopted, for instance, the infliction of burns, rubbing irritant into the eyes, holding the patient over a fire, administration of cow urine etc.<sup>6–9</sup>

Epilepsy can be a source of trouble in a variety of settings, e.g., the workplace, house and school.

In India, school teachers have a pivotal role in dissemination of knowledge and development of positive attitude among school children towards any disease. They can, and indeed should, play a key role in first-aid management of seizures (fits) suffered by any school child. There is, thus, a definite need for the intensive health

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education of teachers on various aspects of epilepsy to mitigate the myths and misconceptions associated with the disease. It has been seen that holding educational workshops is an effective way to improve the attitude of teachers as well as giving them a functional knowledge of how to manage a student who is suffering a seizure at school.<sup>10</sup>

Against this background, the present study was undertaken with the objectives (i) to ascertain the knowledge and practices of school teachers regarding epilepsy; and (ii) to estimate the impact of the investigators' epilepsy intervention educational package on the knowledge and practices of school teachers regarding epilepsy.

## 2. Methods

The Union Territory of Chandigarh is a small, modern, well planned city of northern India with a population of around one million with 9252 km<sup>-2</sup> density. As Chandigarh is both a territory and a city, it is largely urbanized with around 63% of the population residing in the urban area, 30% in slums and 7% in the rural outskirts. The city boasts of excellent health indicators and a high literacy rate of 86.43%. The urban districts of the city consist of 56 sectors and 18 resettlement colonies while rural population resides in 22 villages.

In Chandigarh, there are a total of 106 government schools, as well as a similar number of private schools. They are almost equally distributed in four distinct administrative zones of the Union Territory. For the purposes of the study, assuming the alpha error to be 0.05 and beta error 0.20 (1 – beta = 0.80), and assuming the baseline knowledge of the teachers regarding epilepsy to be 20% and the expected rise in the level of knowledge with the benefit of the epilepsy intervention education package to be 80%, respectively, a sample size of 160 participants was first estimated. Then, taking into account that a possible 20% of participants would be lost by the time of the 3 months follow up study (when the participants would be assessed again), the necessary sample size was re-estimated to be 200. The schools from all categories (public, private and central schools, *Navodaya Vidyalaya*) were selected randomly according to PPS (probability proportional to size) as shown in Table 1 after obtaining necessary permission and consent of the concerned authorities. Then, the principals of the selected schools were asked to nominate one teacher and one student (preferably from class 10–12), both of whom could potentially be peer educators for their school.

The study was carried out using a 'before and after natural experiment design'. The participants included one teacher and one student from each selected school. The study included a baseline

evaluation of participants before the intervention and two post-intervention evaluations of the same participants, i.e., one immediately after the intervention and another after 3 months. A series of workshops on "First-aid management of Epilepsy" was carried out by the authors in May 2012 and three months later, i.e., Aug 2012. An inclusion criterion was for all the selected schools who gave their consent for participation whereas an exclusion criteria was for any students from selected school who were below the 10th class. This paper pertains to data about teachers only to keep the study group homogenous.

The study tools were designed by the investigators of the study. They included (i) Manual on First-aid management of Epilepsy in school students (in Hindi and English languages); (ii) Questionnaire for pre and post assessment; (iii) Observational checklist of first-aid management of epilepsy; (iv) PowerPoint presentations; and (v) Videos about epilepsy, its nature, clinical features, management and associated myths.

The Delphi technique using three rounds of discussions (by the lead author of the study) was used in study to obtain consensus on study tools. The draft of the manual along with the questionnaire, observational checklist, power point presentations, videos, etc., were circulated among the experts in the field of Community Medicine, Neurology, and nursing faculty for content and consensus validity. Their responses after each round was summarized, and any matter of disagreement was again circulated in the next rounds, till everybody reached a point of consensus on the content of the manual and questionnaire. The structured questionnaire was then translated into the local (Hindi) language and pretested in a sample population that was different from study group. The baseline knowledge and skills of participants regarding epilepsy and its management were assessed by means of the questionnaire; and animated/real videos. After that, the participants were provided with general facts about epilepsy; causes and triggers of epilepsy; types of epileptic fits; and first-aid management of epilepsy, including the "Do's and Don'ts" of management during epileptic fits, with the help of interactive presentations, videos, demonstrations on dummy etc., to simulate real life situations. At the end of each day, an evaluation of the level of knowledge, attitude and practices of participants were made in a similar way as during the pre-test. The queries of participants were also answered by the investigators. The same process of testing was repeated after three months to evaluate the retention of knowledge, attitude and skills regarding epilepsy acquired during earlier workshops.

A scoring system was devised to quantify the knowledge and skills of teachers about first-aid management of epileptic fits. The questionnaire of 39 questions included some questions with more than one correct response. A score was assigned to each correct response. During data compilation and analysis, data was divided into three broad groups, namely, knowledge about various domains of epilepsy, attitude about various domains of epilepsy and skill assessment in first-aid management of epilepsy. The first group, i.e., knowledge about epilepsy contained 23 questions under six broad domains; the second group, i.e., attitude about epilepsy, contained 7 questions under three domains; and skill assessment in first-aid management contained 9 questions under two domains. The maximum attainable score by a respondent teacher was 83 (knowledge = 52; attitude = 7; and skills = 24). The score (under each group and total score) of a respondent falls in either of four categories: 25% and below (poor); 26–50% (average); 51–75% (good); and >75% (excellent).

Prior permission was obtained from the Director, Public Instructions (Schools) and the principals of selected schools. Assurance was given that all the information would be kept confidential and no hazardous procedure would be carried out on, or by, the students and the teachers.

**Table 1**  
Profile of the participants in the study.

Variables	Type of school		
	Government (N=58)	Private (N=27)	Total (N=85)
Sex			
Female	45 (77.6%)	24 (88.9%)	69 (81.2%)
Male	13 (22.4%)	03 (11.1%)	16 (18.8%)
Mean age in years (S.D.)	41.2 (8.3)	40.1 (9.8)	40.8 (8.7)
Residence			
Urban	50 (86.2%)	27 (100%)	77 (90.6%)
Rural	07 (12.1%)	00 (00%)	07 (8.2%)
Slum	01 (01.7%)	00 (00%)	01 (01.2%)
Level of teaching			
Primary	06 (10.3%)	00 (00%)	06 (07.1%)
Middle	09 (15.5%)	02 (07.4%)	11 (12.9%)
High	23 (39.6%)	05 (18.5%)	28 (32.9%)
Senior secondary	20 (34.6%)	20 (74.1%)	40 (47.1%)

Monitoring and supervision was an integral part of the study. The Principal Investigator and one Co-Investigator were present throughout the training sessions. A data validation exercise was conducted for all the data collected. This included crosschecking and matching the data from hard copies to the soft copies.

Data was entered into Microsoft Office Excel 2007. Discrete data was analyzed using percentages, range, mean, standard deviation and Pearson's Chi-square test, whereas, analysis of variance (ANOVA) test was used for continuous variables. The level of significance was taken as  $p \leq 0.05$ .

### 3. Results

A total of 85 teachers participated in the study. The profile of participating teachers is shown in Table 1.

#### 3.1. Knowledge about various domains of epilepsy

Most (91.5%) of the teachers had either heard or read about seizures, while more than 3/4 of them (83.3%) had witnessed someone having seizures. Less than half (42.3%) reportedly had relatives or friends suffering from epilepsy. Sixty-nine per cent of the teachers considered epilepsy as a fatal disease initially. However, after the intervention, this figure had dropped to 26% at endline-I and only 11% at endline-II.

Before intervention, nearly half of the teachers (49%) considered epilepsy to be a neurological disease followed by (16%), who thought it to be genetic. After intervention, 87% and 53% considered it to be a neurological and genetic disease, respectively. The causes attributed to epilepsy at before and after intervention were brain infections/tumours (60% vs 92%), birth injury (47% vs 90%), hereditary (39% vs 76%) and accidents (19% vs 82%).

The presence of stress was reported as a major factor (87%) which provokes seizures. However, teachers had a lesser knowledge about other, less obvious factors which could trigger seizures viz., fatigue and fever (38%), deprivation of sleep (31%) and persistent hunger (18%). This knowledge increased substantially to 93% (fatigue and fever), 93% (sleep deprivation) and 86% (persistent hunger) after intervention. A majority of the teachers were aware of symptoms of epilepsy, e.g., rhythmic, jerky movements (72%) and falling down (78%). Before intervention, few of them could correctly recognize warning signs viz., headache (38%) and mental irritation (25%) which however significantly increased to 96% and 89%, respectively after intervention.

Nearly half of the teachers mentioned books/magazines as their most common source of information followed by internet (33%), their physician (29%), and relatives/friends (26%). The knowledge about the nature of the disease at baseline increased after intervention for epilepsy as a neurological disorder (49% vs 87%) and as a genetic disorder (16% vs 53%).

Prior to intervention, nearly 15% of teachers stated that persons with epilepsy were not able to sense a seizure beforehand. This knowledge significantly increased to 68% after intervention. A majority (87%) of them were initially aware about that the fact that epilepsy does not spread by touching. Knowledge about various types of epilepsy increased after intervention (18% vs 97%). The respondents had little knowledge about 'absence seizure' with most common symptom of absence seizure stated by them being 'looking blank' (58%) followed by 'rapid blinking' (12%). Knowledge about 'absence seizure' increased to 98% immediately after the intervention.

Most of the teachers (92%) favoured the view that a person with known epilepsy should carry an identity card, 80% felt that such persons should never swim alone, and 82% opined that they should not be allowed to drive alone. Initially only one-fifth of the teachers believed that vaccination does not help in controlling epilepsy which increased to more than three-quarters of them after intervention.

Prior to intervention, most of the teachers (83%) believed that the mainstay of treatment of epilepsy was medication. Among them, a majority (86%) would advise allopathic treatment for epilepsy, and 51% of the teachers correctly responded stating that a doctor should be called if the sufferer's fits kept recurring, while around 25% would have done so if the patient remained unconscious. This knowledge increased to 90% and 83%, respectively after intervention.

In summary, most of the knowledge domains significantly improved after the intervention package was provided to teachers (Table 2).

#### 3.2. Attitude about various domains of epilepsy

Nearly 70% of the teachers initially believed epilepsy to be a hindrance to education while only 24% continued to believe so after intervention. Similarly, nearly 70% and 80% of the teachers felt that epilepsy interfered with employment and marriage, respectively, while after intervention, only 20% and 31% of them, respectively continued to hold such views. Most of them (83%) did not believe that people with epilepsy were insane.

Around 96% teachers suggested that students with epilepsy should be sent to their regular schools rather than to a special school. Regarding employment, 78% teachers suggested that a person who is found to be suffering from epilepsy should continue in same job. Around 87% of the teachers felt that women with epilepsy have normal pregnancy. Nearly 60% of the teachers opined that epilepsy does not lower mental capacity. However, this figure increased to 89% after intervention.

In summary, most of the attitude domains significantly improved after the intervention package was provided to teachers (Table 3).

**Table 2**  
Knowledge about various domains of epilepsy.

Knowledge domains	Max. score	Mean score (S.D.)			ANOVA; p value
		Baseline	Endline-I <sup>a</sup>	Endline-II <sup>b</sup>	
Nature and classification	06	1.87 (1.16)	4.96 (1.07)	4.50 (1.42)	157.81; 0.00 <sup>c</sup>
Underlying factors	10	5.36 (1.35)	9.01 (1.38)	8.15 (1.71)	140.76; 0.00 <sup>c</sup>
Clinical features	17	9.51 (3.57)	14.35 (2.33)	13.46 (2.42)	68.53; 0.00 <sup>c</sup>
Management	09	4.80 (1.55)	6.08 (1.20)	6.08 (1.10)	26.42; 0.00 <sup>c</sup>
Prevention	05	3.24 (1.21)	3.66 (1.17)	4.29 (0.88)	17.61; 0.00 <sup>c</sup>
General aspects	05	1.75 (0.87)	3.66 (0.75)	3.43 (0.67)	152.10; 0.00 <sup>c</sup>

<sup>a</sup> Immediately after intervention.

<sup>b</sup> Three months after intervention.

<sup>c</sup> Significant.

**Table 3**  
Attitude about various domains of epilepsy.

Attitude domains	Max. score	Mean score (S.D.)			ANOVA; <i>p</i> value
		Baseline	Endline-I <sup>a</sup>	Endline-II <sup>b</sup>	
Epilepsy and education	3	1.82 (0.79)	2.15 (0.70)	2.38 (0.64)	12.20; 0.00 <sup>c</sup>
Epilepsy and employment	2	1.09 (0.63)	1.21 (0.60)	1.31 (0.49)	2.83; 0.06
Epilepsy and marriage	2	1.07 (0.57)	1.28 (0.50)	1.15 (0.40)	3.82; 0.02 <sup>c</sup>

<sup>a</sup> Immediately after intervention.

<sup>b</sup> Three months after intervention.

<sup>c</sup> Significant.

### 3.3. Skill assessment in first-aid management of epilepsy

Only 30% of the teachers had ever provided first-aid for seizure management in their life. Skill assessment showed significant improvement in all the situations after intervention. The mean score regarding first-aid management of child having a fit in school increased from 1.01 at baseline to 2.92 after intervention. Similarly, there was an increase in the mean score regarding precautions for preventing accidents in person with epilepsy (from 0.20 to 0.76); when a child becomes unconscious after fits (from 0.29 to 0.62); and when child falls down following grand mal seizure (from 0.04 to 0.65). There was no significant change in the mean scores of 'observations during a fit' before and after the video showing a simulating fit, but the video on 'Do's & don'ts during a fit' elicited an improvement (Table 4).

The scores obtained by teachers about various domains of epilepsy are given in Table 5. Due to decreased proportion of participants in some groups, the scores were clubbed together as A + B and C + D. There was a significant difference in scores obtained from the teachers regarding various domains of epilepsy before and after intervention (A + B vs C + D).

## 4. Discussion

The present study has revealed that most (91%) of the participating teachers had either heard or read about epilepsy; however their knowledge about various other aspects of the disease was low and sketchy. Similar findings about having 'merely heard' about the disease have been cited in a few other studies conducted amongst teachers: Thailand (58%), Uttar Pradesh, India (97%), Burkina Faso (98%) and Brazil (100%).<sup>11–14</sup> In most of these studies too, the knowledge about causes, types and management of epilepsy was poor.<sup>11–14</sup> Although, in the main, teachers knew that epilepsy is a neurological disorder, they failed, however, to document the correct management of a patient with epileptic

seizures. The view that people with epilepsy are insane varies from population to population. Only 7% in Taiwan and 16% in China assumed there was a direct relation between epilepsy and insanity, whereas 24% in Vietnam made the same assumption.<sup>15–17</sup> Our study found that 16% of the participating teachers initially considered people with epilepsy to be insane. Such a variation in views between different populations could be contributed to by local customs and beliefs in different places. The majority of the teachers (87%) in our study believed that epilepsy was a non-contagious disease. Similar findings have been observed in other studies.<sup>11,18</sup>

The percentage of teachers in our study who believed epilepsy is curable and that medication is a mainstay of treatment (83%) was higher than that observed in other studies.<sup>11,14,18</sup> However, in a study in South India, a similar figure of 78% respondents opined in favour of effective modern treatment of epilepsy.<sup>19</sup> Nearly 48% teachers in a study in Uttar Pradesh (India) felt that people with epilepsy had normal intelligence.<sup>11</sup> In our study, 60% teachers initially and 89% teachers after intervention opined that epilepsy does not lower mental capacity.

In a study from Thailand, 9.8% of teachers were afraid of having an epileptic child present in the classroom while another study from Uttar Pradesh (India) reported a similar fear in 32.2% teachers.<sup>11,14</sup> Also, 20.8% of Indian teachers felt a need of special classrooms for children with epilepsy compared to 15.1% of Thailand teachers. However, very few (4%) of teachers were so apprehensive in our study as to suggest a separate classroom for a child with epilepsy. Denying education to a child with epilepsy based on apprehension of having a seizure in the class is against human rights. The fear of being confronted with a child suffering a seizure in the classroom should be eradicated. There should be good understanding of the condition and appropriate training in how to manage the seizure quickly among school children. Undoubtedly a sense of confidence is essential amongst the teachers as well as the administrators. This clearly indicates the

**Table 4**  
Skill assessment in first-aid management of epilepsy among teachers.

Skill domains	Max. score	Mean score (S.D.)			ANOVA; <i>p</i> value
		Baseline	Endline-I <sup>a</sup>	Endline-II <sup>b</sup>	
Management of hypothetical situations					
Child having a fit in school	4	1.01 (0.87)	2.32 (1.08)	2.92 (0.97)	79.85; 0.00 <sup>c</sup>
Fit lasting longer than 5 min	1	0.84 (0.37)	0.87 (0.34)	0.96 (0.20)	2.96; 0.05 <sup>c</sup>
Precautions for preventing accidents	3	0.20 (0.40)	0.47 (0.50)	0.76 (0.43)	30.73; 0.00 <sup>c</sup>
Child having symptoms of absence fits	1	0.04 (0.19)	0.35 (0.48)	0.85 (0.36)	97.54; 0.00 <sup>c</sup>
Child becomes unconscious after fits	1	0.29 (0.46)	0.36 (0.48)	0.62 (0.49)	10.17; 0.00 <sup>c</sup>
Child falls down following seizures	1	0.04 (0.19)	0.65 (0.48)	0.65 (0.48)	63.29; 0.00 <sup>c</sup>
Reactions to various actions following fit	5	1.53 (1.32)	3.74 (1.42)	4.52 (1.36)	103.52; 0.00 <sup>c</sup>
Videos simulating fits					
Observations during fit	4	1.20 (0.77)	1.56 (1.38)	1.11 (1.76)	2.56; 0.08
Do's and don'ts during fit	4	1.08 (0.76)	1.53 (1.34)	1.11 (1.76)	3.00; 0.05 <sup>c</sup>

<sup>a</sup> Immediately after intervention.

<sup>b</sup> Three months after intervention.

<sup>c</sup> Significant.

**Table 5**  
Distribution of teachers according to score obtained in various domains about epilepsy.

Domain	Score			Chi-square <sup>d</sup>	p Value
	Baseline (%)	Endline-I <sup>a</sup> (%)	Endline-II <sup>b</sup> (%)		
Knowledge					
A	02.3	83.5	65.3	118.7	<0.00 <sup>c</sup>
B	44.8	14.1	34.7		
C	50.6	01.2	00.0		
D	02.3	01.2	00.0		
Attitude					
A	28.2	32.9	55.5	37.5	<0.00 <sup>c</sup>
B	27.1	47.1	36.2		
C	41.2	20.0	06.9		
D	03.5	00.0	01.4		
Skills					
A	01.2	18.8	27.8	99.8	<0.00 <sup>c</sup>
B	08.2	43.5	48.6		
C	62.4	27.1	15.3		
D	28.2	10.6	08.3		

<sup>a</sup> Immediately after intervention.

<sup>b</sup> Three months after intervention.

<sup>c</sup> Significant.

<sup>d</sup> A+B vs C+D.

importance of incorporating adequate training about epilepsy and relevant first-aid in the curricula of teachers' training colleges and schools.

In our study, the source of information about epilepsy was primarily books/magazines and the internet. It is important to keep in mind that the awareness regarding various myths related to diseases with social stigma in India is spread by unscrupulous, unqualified personnel, who advertise their so-called services on public media and the internet.

Similar to our results, a study from Uttar Pradesh found that 87% of teachers were opposed to marriage of their child to a person with epilepsy.<sup>11</sup> These figures contrast with the 36% of teachers in Thailand, who held a similar view.<sup>14</sup> However, after intervention, only 20% and 31% of them felt that epilepsy interferes with employment and marriage, respectively. Clearly a social bias against a person with epilepsy in relation to marriage exists in the Indian populace. The religious belief, that this disease is a punishment or from the Almighty, especially when considering epilepsy to be a hereditary and mental disease, appears to be the reason behind this bias. We, therefore, need to involve religious leaders in an education programme so that they too understand the scientific facts about epilepsy.

Nearly one-third of the teachers in our study had provided first-aid to someone suffering an epileptic seizure. In the Uttar Pradesh study, a quarter of the participating teachers had provided first-aid for seizure management.<sup>11</sup> Forty five per cent of teachers in Thailand had attempted the same.<sup>14</sup> In our study, management of a person having seizure in various hypothetical situations had improved significantly after intervention. A strong public education programme towards a proper first-aid management of epilepsy will go a long way in removing obstacles associated with attitude and fear felt towards epilepsy.

There are very few studies in literature available showing the impact of any equivalent intervention course on the various domains of epilepsy. It has been found that shorter and less complex intervention programmes aimed at students and teachers have also shown beneficial results in providing enlightenment about knowledge, attitude, and perception regarding epilepsy and care during epileptic seizures.<sup>20–22</sup> Similar findings were seen in our study, as after the intervention package, there was a significant improvement in almost all the domains of knowledge about epilepsy and a majority of domains of attitude

towards epilepsy. Although one video (out of two) simulating fits did not result in any significant improvement, the complete intervention package involving power-point presentations, and various videos has effected a significant improvement in knowledge, attitude and skills of respondent teachers. The video depicting 'observation during fits' has not yielded a significant improvement as most of the teachers in our study had already seen a person with epilepsy before the study, so were able to correctly respond even before the study.

## 5. Conclusion

The present study revealed that knowledge about epilepsy among school teachers in Chandigarh tends to be diffused. They did not have enough information concerning factors causing seizures in epilepsy and appropriate first-aid during an epileptic seizure. Despite this, attitudes towards persons with epilepsy were positive. Although, there was a positive impact resulting from a short term intervention on the teachers' knowledge and skills about epilepsy, expectation of a long term benefit without further re-enforcement is questionable. It is recommended that similar workshops that focus on enhancing the knowledge and skills of teachers about neglected health problems like epilepsy should be a regular occurrence. It is hoped that this study will influence policy makers to add regular training programmes of first-aid management of epilepsy into the school curricula.

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