

TRAINING THE TRAINERS AND DISSEMINATING INFORMATION

A strategy to educate health professionals on epilepsy

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ABSTRACT - Purpose: To evaluate the knowledge, attitudes and perceptions of epilepsy in primary care system health professionals prior to and after an educational intervention. **Methods:** Educational interventions were delivered to three groups of people with an interest in epilepsy: 1. Information courses for physicians (241 subjects); 2. Social re-integration course for health professionals and community leaders (631 subjects); 3. "Training the Trainers" Course for physicians (11 subjects). The whole program is flexible and can be tailored for local or regional needs. For the evaluation of this process, health professionals completed a quantitative and qualitative questionnaire to assess their knowledge, attitudes and perception (KAP) of epilepsy prior to the training (pre-test) and 6 months after it (post-test). **Results:** Comparison of knowledge scores prior to (mean=55.8, standard deviation=14.0) and after (mean=71.5, standard deviation=12.0) the intervention showed that physicians had improved knowledge after the training (t-test=7.8, p<0.001). The same pattern occurred with the health professionals: the knowledge score prior to (mean=22.3, standard deviation=12.5) and after (mean=36.6, standard deviation=12.5) the intervention showed that health professionals had improved knowledge after the training (t-test=12.4, p<0.001). Improvements in attitudes and perception also occurred after the courses. **Discussion:** Training courses can promote increased knowledge, attitude and perception in a cost effective way in the primary care setting. However, a continuous education program is required to correct oversights and to improve the management of people with epilepsy.

KEY WORDS: training, educational courses, epilepsy, primary health care, education.

Capacitações e multiplicadores: uma estratégia para educação de profissionais da área de saúde na epilepsia

RESUMO - Objetivo: Avaliar conhecimentos, atitudes e percepção sobre epilepsia de profissionais da saúde do sistema de atenção básica antes e depois de curso de capacitação. **Método:** Cursos de capacitação foram realizados em três grupos de profissionais de saúde: 1. cursos de capacitação para médicos (241 sujeitos); 2. cursos de inserção social para agentes comunitários de saúde (631 sujeitos); 3. cursos de replicadores para médicos (11 sujeitos). O programa de capacitação foi adaptado para as condições de cada local. Para avaliar o processo, foram aplicados questionários a respeito do seu conhecimento, sua atitude e percepção perante à epilepsia (KAP) antes dos cursos (pré-teste) e após a intervenção (pós-teste). **Resultados:** A comparação feita a respeito do conhecimento com médicos mostrou que os mesmos melhoraram seu conhecimento com os cursos (pré-teste: nota média=55,8; DP=14,0) vs. pós-teste: nota média=71,5; DP=12,0; t-test=7,8; p<0,001). O mesmo padrão ocorreu com os agentes comunitários de saúde: pré-teste: nota média=22,3; DP=12,5) vs. pós-teste: nota média=36,6; DP=12,5; t-test=12,4; p<0,001. Com relação a atitudes e percepção, foram observadas melhoras significativas depois da realização dos cursos. **Discussão:** Os cursos de capacitação promovem melhoras no conhecimento, atitude e percepção, com baixo custo e de maneira efetiva, no sistema básico de saúde. Entretanto, um programa de educação continuada deve existir para que consiga corrigir os erros e melhorar o tratamento das pessoas com epilepsia.

PALAVRAS-CHAVE: treinamento, cursos de capacitação, epilepsia, sistema primário de saúde, educação.

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Integral care for people with epilepsy includes seizure control, psychological support and social integration assuring adequate quality of life¹. People with epilepsy and their families can be helped if measures are adopted to reduce stigma, increase awareness that epilepsy can be treated and rehabilitate those who suffer from epilepsy^{2,3}.

Epilepsy is the most common serious neurological condition⁴. An epidemiological study in São Paulo State found a lifetime prevalence of epilepsy of 9.2/1,000 [95% CI 8.4-10.0]⁵. Stigma is present in our society, excluding people with epilepsy from social activities, particularly because of misinformation but also due to lack of appropriate attitudes held by health professionals³.

The treatment gap (lack of treatment or inadequate treatment) shows regional variation but, in general, inadequate or no treatment is a reality for a significant number of people with epilepsy. The majority of people with epilepsy can be classified as having problems of low complexity as seizures can be controlled with one low cost anti-epileptic drug (AED). These are the people with epilepsy who can effectively be treated in the primary care system⁶.

Nevertheless, in order for epilepsy to be managed in the primary care setting, knowledge about epilepsy needs to be enhanced among health professionals⁷. In addition to medical knowledge, a psycho-social approach is required to improve seizure control¹. To some extent, a positive attitude held by health professionals helps to promote appropriate behaviour by patients⁸.

The phase II of the Demonstration Project on Epilepsy part of the *Global Campaign Epilepsy Out of the Shadows-WHO-ILAE-IBE* in Brazil, executed by ASPE, Assistência à Saúde de Pacientes com Epilepsia⁹, focused on educational interventions to improve knowledge, attitudes and perceptions of health professionals and school teachers. Here we describe the development of different modules of educational intervention and their results when applied to primary care health professionals.

METHOD

The development of educational modules followed three main steps: 1. identification of target groups; 2. definition of the objective of the intervention; 3. definition of the teaching contents. The overall goal was to educate health care workers to provide bio-psycho-social management for people with epilepsy and to provide self-sustained education within the network. The primary care setting, particularly in the Family Physician Program model, includes a team of multi-disciplinary professionals, which can be divided into physicians and other health professionals, par-

ticularly health agents and community leaders. The courses were developed for these three groups:

Module 1. Information courses for physicians – This course is of eight hours duration and can be delivered to 35-40 people at a time. The main purpose is to provide pragmatic information on the management of people with epilepsy, including:

- The nature of epilepsy.
- Epilepsy diagnosis.
- Epileptic seizures.
- Treatment.
- Epilepsy in special situations (women, older people, and children).
- Myths and beliefs.
- Psycho-social aspects (stigma, quality of life).

For physicians, the main diagnostic aspect of this module is centred on three questions: *is it epilepsy?* (yes or no); *is the seizure partial or generalized?*; *what is the cause of epilepsy?* (symptomatic, idiopathic, or cryptogenic). With regard to the second question, the professional is advised to ask directly whether the patient has absence spells or myoclonic jerks, as the answer has implications for choosing the antiepileptic drug. The answers to these questions provide a framework of epilepsy management. Where doubt persists, patients should be referred to neurologists.

Module 2. Social re-integration course for health professionals and community leaders – This course is of three hours duration and can be delivered to 60 to 80 people at a time. The objective is to educate these professionals on the main bio-psycho-social aspects of epilepsy to promote the dissemination of correct information in the community. After this course, the health care workers should be able to provide and articulate social support to people with epilepsy. The themes covered are: epilepsy (definition, prevalence, seizures and treatments), psycho-social aspects (social difficulties, prejudice and stigma) and strategies to deal with prejudice and stigma. The aim is to promote advocacy groups for people with epilepsy to enable social re-integration. This module highlighted the importance of working in groups for people with epilepsy, enabling the professionals to set up advocacy groups in their communities, to empower patients and their families on their rights and duties as citizens.

In addition to these educational courses, we devised a course to provide self-sustained education within the health care network. This aims to train a physician to provide education to the rest of the team.

Module 3. "Training the trainers" course for physicians – This course is of 20 hours duration (three days) and can be delivered to up to 30 people at a time. It is important that there is a prior agreement with the site health manager to allow the information courses to run, and that there is a supply of support materials. This module aims to prepare physicians to pass on the information on epilepsy to other health staff, providing a self-sustained education pro-

gram within their health network. This course covers the following aspects: medical aspects (epilepsy diagnosis, epileptic seizures and prevalent syndromes, special situations, treatment with anti-epileptic drugs (AEDs), differential diagnosis, investigations; psychological aspects (self-esteem, self-confidence, depression, anxiety, stigma and quality of life); social aspects (social inclusion).

Participants received teaching material to enable them to run information courses in their communities. This consists of a CD with the lectures as power-point presentations, a booklet with the main aspects taught in the module and a guideline for AED prescription with four first line AEDs (*carbamazepine, sodium valproate, phenobarbital and phenytoin*). Specific booklets were also prepared for the other courses.

The whole program is flexible and can be tailored for local or regional needs. For the evaluation of this process, health professionals completed a quantitative and qualitative questionnaire regarding their knowledge, attitudes and perception (KAP) of epilepsy prior to the training (pre-test) and 6 months after it (post-test). This questionnaire was developed following a standard process for its elaboration and validation¹⁰. Briefly, the steps of the process are the following:

- *Definition of the theme of interest:* A literature review was undertaken and the current knowledge of epilepsy in the primary care setting was established.
- *Delimitation of the population:* Multi-disciplinary primary care health workers (physicians, nurses, psychologists, social workers, dentists, physical therapists), divided into physicians and non-physicians.
- *Definition of item:* We defined which type of possible answer (for example, multiple choice, true or false, scale) would best fit each question.
- *Designing the questionnaire:* The items of the questionnaire were elaborated by a panel of experts in the field of epilepsy. Different questionnaires were designed for the different target populations: physicians and non-physicians. The questionnaire for physicians included questions regarding medical management (drugs, diagnosis and investigations), in addition to attitudes and perceptions.

Each question in the knowledge section of the questionnaire was given a score for the correct answer, and the

final grade was based on the total score achieved, as a percentage between zero and 100 (see appendix), so that we could compare the performance prior to and after the training. We did not identify the respondents, thus a non-paired t-test was used to assess significance of the score achieved prior to and after the training.

RESULTS

The results are presented separately for the three modules.

Module 1. Information courses for physicians – The information courses were provided in different towns of Brazil: Campinas, Rio de Janeiro and São José do Rio Preto in the Southeast; Anápolis, Campo Grande in the Central-west; Cabedelo, Sousa, Patos, in Northeast Brazil, Joinville and Londrina in South Brazil.

Questionnaires were completed by 241 physicians (194 subjects in the pre-test and 47 subjects in both pre and post-test). Table 1 shows the main characteristics of the subjects.

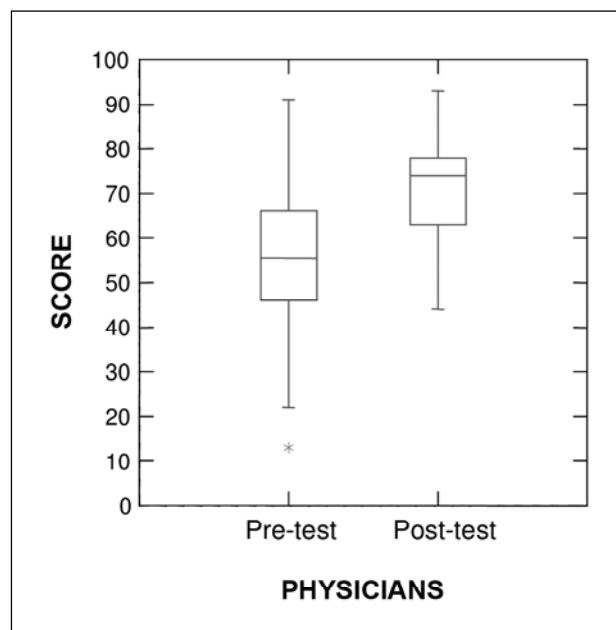


Fig 1. Knowledge test score of physicians pre- and post-training.

Table 1. Physicians' characteristics.

Characteristics	Pre-test	Post-test
Mean age (years)	38 (95%CI: 24-75)	47 (95%CI: 24-76)
Female (%)	53.4	56.2
Job characteristics		
Mean number of years working in the primary health care system	10	11
Physicians with medical residence (%)	61.1	60.4
Mean number of years working in public service	11.5	14.1

Comparison of knowledge scores achieved prior to (mean=55.8, standard deviation=14.0) and after the course (mean=71.5, standard deviation=12.0) showed that the knowledge of physicians was improved after the training (t-test=7.8, $p<0.001$) (Fig 1).

The pre and post-information results on attitude and perception about epilepsy for physicians are presented in Tables 2 and 3.

Module 2. Social re-integration course to health agents and community leaders – This module was run in Campinas, São José do Rio Preto, in the Southeast region, Anápolis, in the Central-West, Cabedelo, João Pessoa, Patos and Sousa, in the Northeast region. Altogether 631 non-graduate health profes-

sionals (Table 4) completed the questionnaires (484 pre-test and 147 both pre and post-test).

Comparison of knowledge scores prior to (mean=22.3, standard deviation=12.5) and after the course (mean=36.6, standard deviation=12.5) showed that health agents had improved knowledge after the training (t-test=12.4, $p<0.001$) (Fig 2).

The subjects' pre- and post-test results on attitude and perception about epilepsy for the second module are presented in Tables 5 and 6.

Module 3. Training the Trainers Course for physicians – This module was provided in Campinas with the support of Unicamp, the Division of Mental Health of the Brazilian Ministry of Health and the

Table 2. Attitudes towards epilepsy in percentage.

Questions	Pre-test			Post-test		
	Yes	No	DNK	Yes	No	DNK
Have you ever seen an epileptic seizure?						
Do you have any relatives with epilepsy?						
Are you able to recognize an epileptic seizure?						
Physicians that do not have patients with epilepsy.						
Estimated mean percentage of referral to neurologist.						
Beliefs about epilepsy	Yes	No	DNK	Yes	No	DNK
People with epilepsy can exercise.	57.3	30.1	12.6	47.9	52.1	0
People with epilepsy can drive cars.	61.2	27.2	11.6	68.7	29.2	2.1
People with epilepsy can have children.	98.5	1.5	0	97.9	0	2.1
People with epilepsy can work in any type of professional activity.	42.7	47.1	10.2	47.9	50.0	2.1

Results presented in percentage: DNK, do not know.

Table 3. Perception regarding epilepsy in percentage.

	Pre-test					Post-test				
	TA	A	WO	D	TD	TA	A	WO	D	TD
There should be more openness about epilepsy.	73.8	10.2	4.4	9.2	2.4	89.6	10.4	0	0	0
Epilepsy is sign of weakness.	0.5	0.5	14.0	18.5	66.5	0	0	0	14.6	85.4
People with epilepsy can be treated by primary care centres.	27.7	44.2	22.8	4.8	0.5	31.2	62.5	0	6.3	0
Epilepsy is a treatable condition.	50.9	29.6	19.0	0	0.5	79.2	20.8	0	0	0
Is the excessive use of alcohol by parents a cause for epilepsy?.	4.4	4.8	56.9	22.3	11.6	0	2.1	12.5	56.2	29.2
People with epilepsy cannot have children.	1.0	1.9	24.7	34.5	37.9	4.2	0	0	37.5	58.3
People with epilepsy can have leadership positions.	50.0	23.3	19.5	2.4	4.8	72.9	18.7	4.2	4.2	0
Excessive suffering during childhood may lead to epilepsy.	5.3	2.9	54.9	27.2	9.7	10.4	6.3	12.5	37.5	33.3
People with epilepsy can live normal lives.	51.9	28.6	10.8	8.7	0	68.7	29.2	0	2.1	0
People with epilepsy can contribute to the community.	66.5	16.0	17.5	0	0	89.6	10.4	0	0	0
People with epilepsy can be better treated in institutions.	1.0	3.4	17.9	29.6	48.1	6.2	0	2.1	29.2	62.5
I feel comfortable and confident to manage epilepsy.	6.8	26.2	20.9	38.3	7.8	16.7	50.0	16.6	16.7	0
People with epilepsy are responsible for their condition.	6.3	10.7	20.4	24.3	38.3	0	10.4	2.1	35.4	52.1
People with epilepsy can get married.	65.0	18.4	16.6	0	0	81.2	14.6	4.2	0	0
People with epilepsy are more irritable.	0	0	14.0	34.1	51.9	0	2.1	0	41.7	56.2

Results presented in percentage: TA, totally agree; A, agree; WO, without opinion; TD, totally disagree; D, disagree.

Table 4. Subjects' characteristics.

Characteristics	Pre-test	Post-test
Mean age (years)	32	33
Female	73%	87%
Mean number of years working in the primary health care system	2.3	2.5

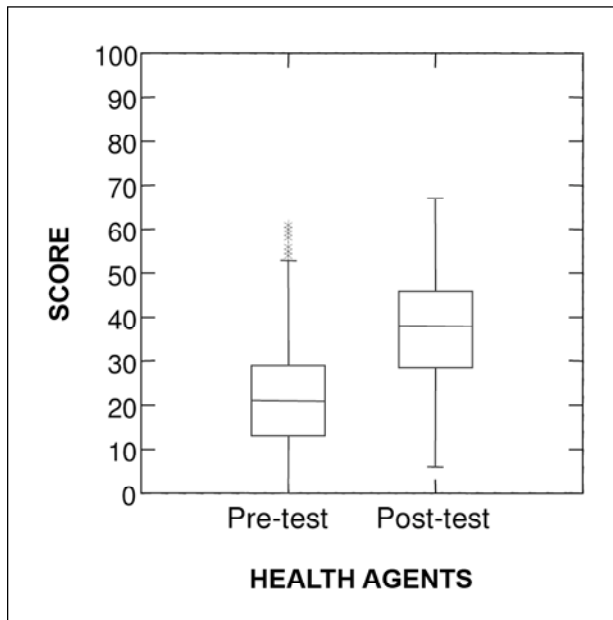


Fig 2. Knowledge test score of health agents pre- and post-training.

Pan-American Health Organization (PAHO). Physicians in 11 Brazilian towns participated.

Following this course, eleven physicians were enabled to be trainers.

Figure 3 shows the outcome of this activity, with follow-up activity carried out by five of eleven participants.

In the towns of Londrina, Joinville, Vitória da

Conquista and Campo Grande, the physicians delivered information courses to the team of primary care health workers in the Family Physician Program. The physician from Cabedelo in Paraíba state went further by cooperating with local and State Health Departments in promoting a large scale information course for 610 health professionals, of whom 140 were physicians including 25 trainers. These professionals were from all over the state. This course was delivered by four ASPE personnel with the assistance of PAHO.

Contact was lost with the physicians from Imperatriz and Belém. In the other towns, no further activities were carried out mainly due to lack of cooperation by local health administrators.

In all modules, participants expressed their opinions or wrote comments about the course. The general opinion was that the teaching methodology was simple with pragmatic information, which helped to simplify the management and treatment of epilepsy. The participants therefore felt more confident after completing the courses.

DISCUSSION

Here we describe information courses for primary health care professionals, aiming to improve the management of people with epilepsy in the context of the Brazilian Demonstration Project of the *Global Campaign Against Epilepsy*. We found that in the

Table 5. Attitudes on epilepsy in percentage.

Questions	Pre-test			Post-test		
Have you ever seen an epileptic seizure?	71.3			69.4		
Do you have any relatives with epilepsy?	53.1			48.9		
Are you able to recognize an epileptic seizure?	29.1			76.8		
Health professionals that do not have patients with epilepsy.	56.6			41.5		
Beliefs about epilepsy	Yes	No	DNK	Yes	No	DNK
People with epilepsy can exercise.	30.8	23.8	45.4	37.1	32.3	30.6
People with epilepsy can drive cars.	26.8	34.9	38.3	46.7	32.3	21.0
People with epilepsy can have children.	80.4	0.4	19.2	91.9	0	8.1
People with epilepsy can work in any professional activity	35.3	29.9	34.8	48.4	27.4	24.2

Results presented in percentage: DNK, do not know.

Table 6. Perception regarding epilepsy in percentage.

	Pre-test					Post-test				
	TA	A	WO	D	TD	TA	A	WO	D	TD
There should be more openness about epilepsy.	75.4	15.7	8.9	0	0	76.2	22.4	1.4	0	0
Epilepsy is sign of weakness.	2.5	0.2	18.0	40.5	38.8	0	0.7	3.8	49.7	44.9
People with epilepsy can be treated by primary care centres.	13.4	26.2	58.4	15.5	3.3	13.6	30.6	25.0	23.3	7.5
Epilepsy is a treatable condition.	29.9	44.8	22.6	2.3	0.4	40.8	53.8	4.7	0.7	0
Excess of alcohol by the parents is a cause for epilepsy.	2.7	8.7	65.4	17.8	5.4	1.4	8.8	44.9	29.9	15.0
People with epilepsy cannot have children.	2.7	2.3	40.8	39.5	14.7	2.7	1.3	13.0	54.4	28.6
People with epilepsy can get leadership positions.	28.7	37.8	28.5	2.9	2.1	47.6	34.0	13.6	4.1	0.7
Excess of suffering during childhood may lead to epilepsy.	4.3	4.7	64.2	19.8	7.0	3.4	12.2	36.1	36.7	11.6
People with epilepsy can lead a normal life.	34.5	40.9	20.7	2.7	1.2	57.1	36.7	6.2	0	0
People with epilepsy can contribute to the community.	42.1	37.6	18.7	1.2	0.4	36.0	59.9	3.4	0	0.7
People with epilepsy can be better treated in institutions.	11.8	15.3	40.3	22.3	10.3	11.6	14.9	23.8	41.5	8.2
I feel comfortable and confident to manage epilepsy.	3.7	10.3	34.3	36.2	15.5	8.2	27.2	22.5	33.3	8.8
People with epilepsy are responsible for their condition.	4.9	13.0	35.2	27.1	19.8	7.5	24.5	17.7	36.0	14.3
People with epilepsy can get married.	41.3	41.1	16.8	0.6	0.2	63.3	29.9	5.4	0.7	0.7
People with epilepsy are more irritable.	2.1	3.3	29.7	39.9	25.0	1.4	2.0	10.2	55.1	31.3

Results presented in percentage: TA, totally agree; A, agree; WO, without opinion; TD, totally disagree; D, disagree.

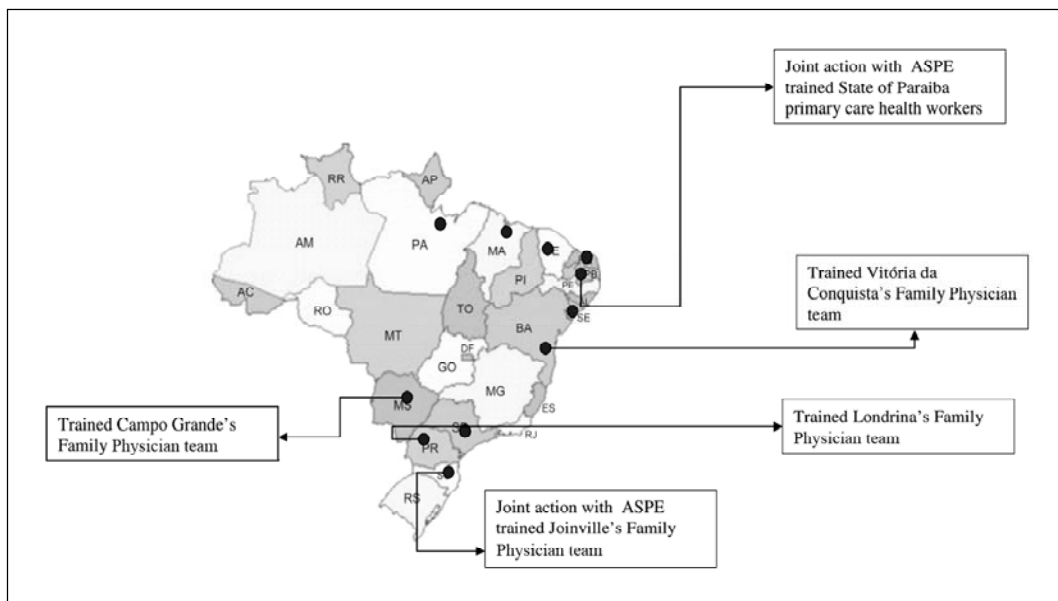


Fig 3. Health professionals' results in five cities.

public health context, information courses can promote better management of epilepsy, including most common medical, psychological and social aspects associated with epilepsy, through increased knowledge, attitude and perception.

In Brazil, medical services for epilepsy particularly at primary care level are often of poor quality mainly due to the lack of knowledge and informa-

tion⁷. For this reason, providing basic information and knowledge about the condition to primary care teams may lead to improvements in epilepsy care at this level⁷.

The results were largely positive, and showed that the modules seem to improve knowledge, and change attitudes towards and perception of epilepsy, as shown by the significant differences between the

pre-test and post-test scores in the modules. On average physicians improved by 16%; and health agents improved by 14%. It is important to highlight that the interval between the questionnaires was six months in each group. Thus these data suggest that people retain knowledge. Nevertheless, the knowledge of health agents even after the training was still below 50%, and some questions were still answered inappropriately by some physicians. These facts reinforce the necessity of continuous education in order to correct oversights and improve the management of people with epilepsy.

The qualitative assessment of the training the trainers' module suggests that these low cost courses are highly effective and can quickly expand the information programme. Originally 11 physicians were trained and, after the course, these professionals trained a further 810 new health professionals, including workers of the primary care teams. This module allows a fast and effective expansion of the information courses covering health staff in many areas of the country.

Theoretically, it should be possible for the information module to be used to provide basic epilepsy education to the whole primary care system in Brazil, which consists of around 60,000 Basic Health Units (BHU). The Family Physician Program currently has about 25,000 teams distributed over 5,000 locations¹¹. Each team comprises a physician, a nurse, a nurse assistant, and four to six health agents, and provides health care for an average of 1,000 families. This represents health care for over 79 million people. We suggest the use of large scale information courses run either regionally or at state level, to disseminate basic information. Running the courses in each state is more feasible than a regional approach because of political boundaries. A mathematical exercise can illustrate how 25,000 teams can be provided with basic information. Using the large scale information course conducted in the state of Paraíba (attended by 610 health professionals, including delivering the "training the trainers" module for 25 physicians) as an example, and assuming that each trainer would then run three courses for 35 primary care physicians per course, this would provide education for 2,625 physicians. Thus, in theory, it only would require only 10 large scale information courses to reach all the physicians of the 25,000 teams of Family Physician Program.

The information courses showed that health professionals can improve their knowledge, attitude and

perceptions regarding epilepsy. These modules (1 and 2) showed a decrease of doubt in all aspects of epilepsy, especially the perception of epilepsy: the negative beliefs and myths about this condition were better comprehended and the doubts decreased a lot. The physicians (module 1) learned how to diagnosis and to manage patients with epilepsy, minimising neurologist referral, and learned about specific issues concerning women, causes and investigations. The other health professionals (module 2) could understand certain aspects about epilepsy, including perceptions, implications for women, diagnosis of epilepsy and beliefs.

Epilepsy should be regarded as a public health problem, and most cases are of low medical complexity which, according to the WHO, should easily be managed at primary care level. We believe that this is possible if resources are directed towards making treatment and rehabilitation accessible for patients via a broad action based on the Primary Health Care. The psycho-social and economic impact of epilepsy demands a broad and sustained medical and social action.

In conclusion, training courses can promote increased knowledge, attitude and perception in a cost effective way in the primary care setting. However, a continuous education program is required to improve the management of people with epilepsy.

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Appendix. Knowledge test score.

Questions	Correct answer	Score
8a Do you know patients' rights or limitations related to epilepsy?	Yes	1
8b Describe the limitations	Driving is not allowed if seizures are not controlled, work at heights, radical sports, work with machineries...	2
9a Can patients with epilepsy do any type of exercise?	No	1
9b May patients with epilepsy drive?	No	1
9c Can patients with epilepsy have children?	Yes	1
9d Can patients with epilepsy work in any type of professions?	No	1
9e Explain why you answer NO for questions 9a to 9d		2
11a Is there drug interaction between antiepileptic drugs and other frequently used drugs?	Yes	1
11b Explain:	Increase hepatic metabolism...	2
12a Can somnolence be an AED side-effect?	Yes	1
12b Can anxiety be an AED side-effect?	Yes	1
12c Can dizziness be an AED side-effect?	Yes	1
12d Can vomiting be an AED side-effect?	Yes	1
12e Can headache be an AED side-effect?	Yes	1
12f Can ataxia be an AED side-effect?	Yes	1
12g Can impotence be an AED side-effect?	Yes	1
12h Can increased seizure frequency be an AED side-effect?	Yes	1
12i Can hirsutism be an AED side-effect?	Yes	1
12j 12a to 12i are correct	Yes	2
13a Can women with epilepsy have normal deliveries?	Yes	1
13b Can women with epilepsy breastfeed?	Yes	1
13c Can women with epilepsy use oral contraceptives?	Yes	1
13d Can women with epilepsy have tubal ligation?	Yes	1
14a Should AEDs be interrupted during pregnancy?	No	1
14b Explain:	The risk benefit between having seizures and fetal malformation weighs more in favor of using the drugs to avoid seizures	2
15a Are AEDs associated with a high percentage of fetal malformation?	No	1
15b Explain	The risk of fetal malformation for women taking AEDs is below 10%.	2
16 What is the percentage of controlled epilepsy?	80%	2
17 Are convulsions the only type of epilepsy presentation?	No	1
18 Is convulsion synonymous with epilepsy?	No	1
19 Which drug below is used to treat epilepsy?	Phenobarbital	1
20 What is the age range for febrile convulsion?	0 to 5 years	1
21 Should febrile convulsions always be treated with AEDs?	No	2
22a Is photosensitivity one of trigger factors associated with epilepsy?	Yes	1
22b Can sudden interruption of AEDs trigger seizures?	Yes	1
22c Can sleep deprivation trigger seizures?	Yes	1
22d Can severe stress trigger seizures?	Yes	1
22e 22a to 22d are correct	Yes	2
23a Is head trauma a risk factor for epilepsy?	Yes	1
23b Are meningitis and encephalitis risk factors for epilepsy?	Yes	1

Appendix. Knowledge test score (continuation).

Questions	Correct answer	Score	
23c	Is tuberculosis a risk factor for epilepsy?	Yes	1
23d	Are obstetric complications risk factors for epilepsy?	Yes	1
23e	Are gastric ulcers a risk factor for epilepsy?	No	1
23f	Is flu a risk factor for epilepsy?	No	1
23g	Is high fever a risk factor for epilepsy?	No	1
23h	Is malaria a risk factor for epilepsy?	Yes	1
24	Can epilepsy start at any age?	Yes	1
25\$	What type of AED would you use in a status epilepticus?	Options: Diazepam, Phenytoin	2
26	What would you do during a convulsion?		
26a	Turn patient on his/her side?	Yes	1
26b	Remove anything that could be a danger to the patient?	Yes	1
26c	Pull the patient's tongue?	No	1
26d	Put something in the patient's mouth to avoid tongue biting?	No	1
26e	Give oxygen?	Yes	1
27\$	When starting AEDs the physician should; (Choose the correct answer)	Start with the minimal dosage in monotherapy	1
28\$	Which AED is often used in generalized epilepsy?	Option: Valproic acid	2
29\$	Which AEDs are often used in partial seizures?	Option: Phenobarbital, Carbamazepine	2
30a\$	Is electroencephalography part of epilepsy investigation?	Yes	1
30b\$	Is electrocardiography part of epilepsy investigation?	No	0
30c\$	Is skull xray part of epilepsy investigation?	No	0
30d\$	Is brain CT part of epilepsy investigation?	Yes	1
30e\$	Is brain MRI part of epilepsy investigation?	Yes	1
30f\$	Is brain mapping part of epilepsy investigation?	No	0
30g\$	Is CSF tap part of epilepsy investigation?	No	0
30h\$	Is psychiatric investigation part of epilepsy investigation?	No	0
31\$	EEG should be requested:	To help in the diagnosis of types of epilepsy.	2
32\$	Neuroimaging should be requested:	Whenever a brain lesion is suspected	2
33\$	In patients on AEDs:		
33a	Women should not get pregnant, as there is a high risk for the offspring	False	1
33b	Any form of contraceptive can be effective	False	1
33c	The risk of fetal malformation is around 50%	False	1
33d	AEDs should always be reduced during pregnancy	False	1
33e	Women should not breast feed, because of high levels of AED in the maternal milk.	False	1

\$ The answers of these questions were not counted in the final score of the health professionals .

The scores of each question were added, and the final sum was converted to a percentage ranging from zero to 100.