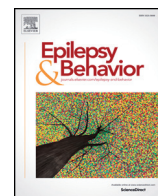




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## First-aid management of tonic-clonic seizures among healthcare personnel: A survey by the Apulian section of the Italian League Against Epilepsy

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### ABSTRACT

**Introduction:** To evaluate the knowledge of healthcare workers about first-aid measures to be performed during and after a tonic-clonic seizure.

**Methods:** One hundred and fifty-four healthcare workers (86 physicians) working at 8 tertiary hospitals in the Apulia region, Italy, responded to a questionnaire comprising of 28 questions based on available Italian and international recommendations about what to do during a tonic-clonic seizure.

**Results:** One hundred and fifty-four healthcare workers completed and returned surveys with a response rate of 96.25%. There were 55 nurses (35.7%), 86 physicians (55.8%), and 13 healthcare workers with different roles (Electroencephalograph technicians, psychologists, social workers). Among physicians, there were 7 cardiologists, 3 surgeons, 12 infectious-disease specialists, 11 internal medicine specialists, 2 psychiatrists, 2 gynecologists, 27 specialists working in the emergency department, and 22 physicians with different specializations. Nearly 90% of the respondents identified head protection as important first aid, while 100% responded to not keep the legs elevated. To avoid tongue bite, both physicians and other healthcare workers would put something in the mouth (54.0%), like a Guedel cannula (71.0%) fingers (29.5%). Grabbing arms and legs, trying to stop the seizure, would be potentially performed by 11.6% of our sample. Physicians would administer a benzodiazepine during the seizure (65.7%) and during the postictal phase (29.2%), even if the patient is known to have epilepsy (23.7%), and in this case, 11.3% of respondents would administer the usual antiepileptic medications. More than half of respondents would call the emergency telephone number, because of necessary hospitalization in case of tonic-clonic seizure, even if it is experienced by a patient known to have epilepsy.

**Conclusion:** Our survey suggests the need for epilepsy educational programs on first-aid management of seizures among healthcare workers.

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## 1. Introduction

Suspected seizures make up 3.3% of all emergency incidents, but the majority of them are rapidly self-limiting, and only a minority of patients require medical treatment [1–3]. In fact, patients with epilepsy are often taken to the emergency department not because of a clinical need but because clinicians often do not feel sufficiently confident or informed on how to manage seizures [4,5].

The majority of published questionnaires completed by healthcare personnel examine mostly knowledge, attitudes, perception, and therapy of epilepsy [6–9]. By contrast, there is a small amount of research addressing knowledge about the first-aid management of epileptic seizures [10–14], particularly the tonic–clonic seizure. The objective of this study was to evaluate the knowledge of healthcare workers about first-aid measures to be performed during and after a tonic–clonic seizure.

## 2. Materials and methods

### 2.1. Study population

From 2015 to 2017, the Apulian section of the Italian League Against Epilepsy (LICE) conducted a project named *#SoprenderEpilessia*, in Apulia, Italy, consisting of information and training meetings on epilepsy with patients, caregivers, healthcare personnel, and the general population (primary school students and teachers). Furthermore, a questionnaire about knowledge of first-aid management of tonic–clonic seizures was administered to the healthcare personnel.

The questionnaire was administered to clinicians and healthcare workers of 8 tertiary hospitals in the Apulian region, Italy, from January to December 2016. Apulia is a region in Southern Italy and comprises 19,345 km<sup>2</sup>; its population is about four million.

Participants were medical doctors, nurses, medical technicians, psychologists, and social workers, working in the selected hospitals. Neurologists were excluded. All participants signed an informed consent document. They completed the questionnaire outside of regular working hours and returned the survey anonymously to one of the authors.

### 2.2. Questionnaire

The questionnaire was designed according to available Italian [15] and international [16] recommendations about what to do if someone is having a tonic–clonic seizure. The recommendations include putting something soft under a patient's head, to not put anything in the patient's mouth, and to not restrain their movements. Once the shaking has stopped, it is important to roll them on to their side into the recovery position and to stay with them until they are fully recovered. Usually when a person has a tonic–clonic seizure, there is no need to call an ambulance unless it is the person's first seizure, they have injured themselves, one seizure immediately follows another with no recovery in between, or the seizure lasts for more than 5 min.

The questionnaire was comprised of 28 questions (see, Table 1). Survey questions included demographic information about the respondent, including sex, age, medical specialization, and years in practice (6 items). Two questions investigated whether respondents have ever seen or treated a tonic–clonic seizure. Further investigated aspects regarded: first-aid knowledge for tonic–clonic seizure (10 items) and first-aid knowledge for the post-ictal phase (7 items). Finally, 3 questions investigated the approach toward a tonic–clonic seizure experienced by a known patient with epilepsy. A brief description of a tonic–clonic seizure was provided before the respondents answered the questions, specifying that the duration of the seizure was 2–3 min. All items were closed questions that could be answered yes/no or left blank. The emergency telephone number for emergency medical service in Italy is 118.

### 2.3. Statistical analysis

Data from each interview were transferred from paper surveys to an electronic database. The data were expressed as mean  $\pm$  SD, unless otherwise indicated, and analyzed using R version 3.3.1 (R Foundation for Statistical Computing, Vienna, Austria). Crude differences across groups were evaluated by means of the Pearson's Chi-squared test and *t*-test as appropriate.

**Table 1**  
Questions regarding knowledge of tonic–clonic seizures.

	All	Physicians	Nurses and other healthcare workers	p-Value
Have you ever seen a tonic–clonic seizure?	114/152 (75.0%)	59/85 (69.4%)	55/67 (82.1%)	0.11
Have you ever treated a tonic–clonic seizure?	102/151 (67.5%)	56/85 (65.9%)	46/67 (68.6%)	0.85
During the tonic–clonic seizure				
Q1. I put immediately something in the mouth to avoid tongue bite	80/148 (54.0%)	37/81 (45.7%)	43/67 (64.2%)	<b>0.04</b>
Q2. If available, I place a Guedel cannula to maintain or open a patient's airway	103/145 (71.0%)	57/80 (71.2%)	46/65 (70.8%)	0.99
Q3. If nothing is available, I use my fingers to avoid tongue bite	44/149 (29.5%)	16/82 (19.5%)	28/67 (41.8%)	<b>0.005</b>
Q4. I keeps his/her legs elevated until seizure stops	0/149 (0%)	0/82 (0%)	0/67 (0%)	1.00
Q5. I put something soft under the head to avoid repetitive banging of the head	135/151 (89.4%)	73/84 (86.9%)	62/67 (92.5%)	0.39
Q6. I grab arms and legs, trying to stop the seizure	17/147 (11.6%)	6/81 (7.4%)	11/66 (16.7%)	0.14
Q7. I immediately call 118, leaving the patient alone and waiting until the seizure stops	102/145 (70.3%)	56/81 (69.1%)	46/64 (71.9%)	0.86
Q8. I do nothing, waiting until the seizure stops	48/139 (34.5%)	21/80 (26.2%)	27/59 (45.8%)	<b>0.03</b>
Q9. I loosen anything tight around his/her neck	75/143 (52.4%)	39/82 (47.6%)	36/61 (59.0%)	0.23
Q10. If available, I immediately administer a benzodiazepine, in order to stop the seizure	94/143 (65.7%)	61/82 (74.4%)	33/61 (54.1%)	<b>0.02</b>
After the tonic–clonic seizure stops				
Q11. I immediately call 118, leaving the patient alone	53/145 (36.6%)	27/81 (33.3%)	26/64 (40.6%)	0.36
Q12. I roll the victim on his/her side	135/149 (90.6%)	77/84 (91.7%)	58/65 (89.2%)	0.61
Q13. I keeps his/her legs elevated	10/147 (6.8%)	5/82 (6.1%)	5/65 (7.7%)	0.70
Q14. If the patient is unconscious, I practice a cardiac massage or I perform the Heimlich maneuver	33/144 (22.9%)	22/81 (27.2%)	11/63 (17.5%)	0.17
Q15. I loosen anything tight around their neck	91/145 (62.8%)	47/81 (58.0%)	44/64 (68.8%)	0.18
Q16. If available, I immediately administer a benzodiazepine to prevent a second seizure	43/147 (29.2%)	24/83 (28.9%)	19/64 (29.7%)	0.92
Q17. Firstly, I wonder if the patient suffers from epilepsy	136/149 (91.3%)	77/83 (92.8%)	59/66 (89.4%)	0.47
A known patient with epilepsy experiences a tonic–clonic seizure. In this case				
Q18. If available, I immediately administer a benzodiazepine at the end of the seizure	33/139 (23.7%)	20/82 (24.4%)	13/57 (22.8%)	0.83
Q19. If available, I immediately administer his/her antiepileptic drug	15/133 (11.3%)	10/78 (12.8%)	5/55 (9.1%)	0.50
Q20. I immediately call 118, leaving the patient alone and waiting until the seizure stops	90/139 (64.7%)	47/80 (58.7%)	43/59 (72.9%)	0.08

Total number of 'yes' responses and total number of respondents are given with percentages. p-Value was computed to establish differences among physicians and other healthcare workers. Bold number indicate significance at p-value < 0.05.

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