



Public awareness towards events at the onset of seizures and first aid management of Epilepsy

Mysara Alfaki

Nursing department, College of applied medical sciences, Taif university, Saudi Arabia

*Correspondence: alfaki@tu.edu.sa Received 15 Aug. 2023, Revised: 19 September 2023, Accepted: 22 September 2023 e-Published: 30 September 2023

The primary objective of first-aid procedures is to ensure the safety and well-being of those experiencing an epileptic seizure. A lack of information or misconceptions about first-aid techniques during the observation of a seizure increases the probability of ineffective or harmful interventions. Furthermore, public awareness about first-aid measures must be evaluated in order to identify society's educational needs. This study aims to assess the level of public awareness toward epilepsy first-aid measures in Taif, Saudi Arabia. In Taif, Saudi Arabia, A cross-sectional study addressing the general public with a validated Arabic questionnaire was conducted between March 18, 2022, and June 3, 2022, a questionnaire with three sections, including demographic information about the responder, was distributed via social media platforms (Whats App and Telegram). The study included an overall of 500 respondents whose met the inclusion criteria. The characteristics of the subjects were described using descriptive statistics, and differences were assessed using the independent sample t test and 2-way ANOVA. The alpha value used for statistical significance was 0.05. A total of 500 individuals who met the inclusion criteria were included. The mean (standard deviation) awareness score for epilepsy symptoms was 6.33(1.70). The most common seizure symptom, according to almost 491 (98.2%), is falling. At the time of the seizures, the mean (SD) awareness score for first aid measures was 9.32(2.91). Female participants had a considerably higher mean (SD) total on first aid measures score than male participants: $P < 0.05$ for 9.76(2.89); 95% CI: 9.30-10.18 versus 9.07(2.90); 95% CI: 8.75-9.39. Participants who were divorced and never married had a considerably higher mean (SD) score than those who were married. The average awareness score for first aid measures during seizures was found to be 9.32 (SD = 2.91), suggesting that there is a widespread level of knowledge within the population about these procedures. The general public is also aware of the symptoms and events that occur during seizures. However, the study proposes that public awareness efforts and first-aid training courses should be used to improve knowledge and practice of epilepsy first aid.

Keywords: awareness, epilepsy, public, first-aid measures, seizure, symptoms.

INTRODUCTION

Various cultures have various levels of public awareness about epilepsy first aid practices. Individuals diagnosed with epilepsy, often referred to as people with epilepsy (PWE), face societal stigmatization and prevalent misunderstandings about the etiology, prognosis, therapeutic interventions, and appropriate first-aid measures for seizures (Lkhamee et al. 2015). A seizure, often known as an epileptic seizure, refers to a distinct time characterized by symptoms resulting from abnormal and excessive or synchronized activity of neurons inside the brain (Fisher et al. 2014). The observable manifestations encompass a spectrum of symptoms, ranging from generalized convulsive movements affecting a significant portion of the body and resulting in a loss of consciousness (referred to as tonic-clonic seizures), to localized shaking movements affecting only a specific area of the body and

accompanied by varying degrees of consciousness (known as focal seizures), to brief and subtle episodes of temporary unawareness (referred to as absence seizures) (Misulis and Murray. 2017). The probability of experiencing a seizure again during a five-year period after the first occurrence of a seizure in adults is estimated to be 35%. However, those who have already had a second seizure have a much higher risk, with the chance of seizure recurrence increasing to 75%. The precise prevalence of epileptic seizures in low- and middle-income countries remains uncertain; nonetheless, it is anticipated to surpass that seen in high-income ones (Ba-Diop et al. 2014). This could be attributed to an increase in the risk of road accidents, birth traumas, malaria, and other parasite illnesses (Ba-Diop et al. 2014). The management of an individual experiencing an ongoing seizure involves the implementation of measures to protect the person from

possible dangers, such as nearby objects, while also addressing the person's airway, respiration, along with circulation. To prevent choking, the person should be placed on their side, which is known as the recovery posture (Betieman, 2015) [5]. In the event that an individual has respiratory distress due to an obstruction in their airway, it may be necessary to provide therapeutic interventions aimed at alleviating the blockage and restoring normal breathing function. It has been estimated that a range of 8-10% of individuals may have an epileptic seizure at some point of their lifetime (Gavvala and Schuele, 2016). A limited number of research investigations conducted in Saudi Arabia, particularly in Riyadh and Khamis Mushait, have shown that instructors possess a sufficient level of experience (Alqahtani, 2015, Al-Harbi et al. 2018). Similar studies in Japan, Kuwait, and Khartoum found that teachers lacked basic knowledge of epilepsy and seizure first aid (Al-Hashemi et al. 2016, Elhassan et al. 2017, Okumura et al. 2020). In contrast, educators in Tabuk, Arar, and Makkah exhibit a deficiency in their understanding of the subject matter under investigation (Alamri et al. 2018, Alkhotani et al. 2019, Al-Ruwaili, 2019). The primary objective of first-aid procedures is to ensure the safety and well-being of those experiencing an epileptic seizure. A lack of information or misconceptions about first-aid techniques during the observation of a seizure increases the probability of ineffective or harmful interventions. Furthermore, public awareness about first-aid measures must be evaluated in order to identify society's educational needs. This study aims to assess the level of public awareness toward epilepsy first-aid measures in Taif, Saudi Arabia.

MATERIALS AND METHODS

Taif University's Research Ethics Committee approved the study in March 2022. From March to June 3, 2022, a descriptive cross-sectional study was undertaken in Taif, Saudi Arabia. Before taking part in the study, participants provided informed consent, and all data was kept confidential. Furthermore, participants were free to exit the study at any time.

Setting and sampling

This research was carried out in Taif, Saudi Arabia, from March 2022, until June 2022. Taif has a population of 93,300. Our target demographic included only young adults (over the age of 18), adults, and seniors who were willing to engage in the study regardless of their educational level. The sample size was not estimated, and a total of 500 people accepted to participate in this study using the convenience sampling technique.

Variables and data collection

Participants' socio-demographic data, awareness of seizures symptoms, and first-aid measures at the time of seizures were all variables. A modified validated Arabic

questionnaire was employed. The questionnaire was adapted from a study conducted in Tehran that measured public awareness, attitudes, and first-aid measures for epilepsy. The questionnaire was divided into three sections: demographics (sex, marital status, nationality, educational level, and occupation) events at the onset of seizures, and first aid measures (helpful and potentially harmful measures).

The items of the questionnaire were adapted from a prior study conducted in Tehran (Kangevari et al. 2019). A group of five neurologists, public health, and health education professionals assessed the questionnaire's content validity. For each scale, an item discrimination analysis was performed to exclude items that were too difficult or too easy. For factor structure, factor analysis was used. The three questionnaire scales were tested and retested separately over a two-week period. The awareness scale had a test-retest correlation of 0.87; the KuderRichardson-20 was employed to prevent overestimation of internal consistency, and the coefficient was 0.83. The attitudes scale has a test-retest correlation of 0.89 and an alpha coefficient of 0.9. The questionnaire was distributed via social media platforms (WhatsApp and Telegram).

Data analysis

IBM SPSS Statistics 21 (Chicago, IL, USA) was used for statistical analysis. In terms of knowledge, each accurate answer received one point. The independent-sample t-test and one-way analysis of variance (ANOVA) tests were employed to compare the means of two groups and three groups or more. A significant level of less than 0.05 was considered.

RESULTS

A total of 500 individuals who met the inclusion criteria were included. 317 (63.4%) of the participants were men, and 490 (98.2%) were Saudi. When it comes to marital status, the majority of 253 (50.6%) were never married. In terms of educational attainment, 339 (67.8%) had an associate degree and 117 (23.4%) had a high school diploma and diploma. Unemployment was reported by 178 (35.6%) of the interviewees, with 133 (26.6%) being Professionals.

Awareness about events at the onset of seizures

The mean (SD) awareness score for epileptic symptoms was 6.33(1.70), with a range of 0.00 to 13.00. The most common seizure symptom, according to almost 491 (98.2%), is falling (Table 1). Although 483 (96.6%) indicated that seizures can cause loss of consciousness, 469 (93.8%) mentioned entire body shaking as a symptom of epilepsy. Foaming at the mouth was described as an occurrence during the onset of seizures by 463 (92.6%) of the subjects. Among these 500 people, 82 (16.4%) stated that urinary incontinence cannot be occur at the onset of seizures (Table 1).

Table 1: Awareness about events at the onset of seizures (N=500).

Statement	Yes	Percent (%)	No	Percent (%)
Events at the onset of seizures				
Whole body shaking	469	93.8	31	6.2
Foaming at the mouth	463	92.6	37	7.4
Loss of consciousness	483	96.6	17	3.4
Tongue biting	477	95.4	23	4.6
Body stiffening	480	96.0	20	4.0
Falling	491	98.2	9	1.8
Staring	461	92.2	39	7.8
Urinary incontinence	418	83.6	82	16.4

Awareness about first-aid measures at time of seizures

The mean (standard deviation) awareness score for first aid measures was 9.32 (2.91), with a range of 0.00-14.00. Participants' knowledge of first-aid measures in the event of seizures. The majority of 427 (85.4%) volunteers attempted to keep the seizing individual from falling. However, more than two-thirds of those who took part rolled the seizing individual on one side, which may have been fatal. Furthermore, 392 people (78.4%) did not try to open their mouth between their jaws during the seizure. And 349 (69.8%) of the participants did not attempt to restrain the individual during the seizure. Furthermore, 485 (97.0%) of participants feel that loosening clothing around a person's neck during a seizure is a helpful measure. and 491 (98.2%) of participants cleared the area of potentially hazardous things. (Table 2)

Analysis of participants' total first aid measures score

Female participants had a considerably higher mean (SD) total first aid measures score than male participants: $P > 0.05$ for 9.76(2.89); 95% CI: 9.30-10.18 versus 9.07(2.90); 95% CI: 8.75-9.39. The mean (SD) score of divorced and never married participants was considerably higher than that of married people: $P > 0.001$ for 10.79 (2.42); 95% CI: 9.33-12.00 and 9.63 (3.14); 95% CI: 9.22-10.05 versus 8.90 (2.62); 95% CI: 8.54-9.24.

Participants with a primary school diploma, a bachelor's degree, or a PhD had a considerably higher mean (SD) score than those with a middle school or high school education: 9.53 (2.91); 95% CI: 9.21-9.86, or 9.71(1.96); 95% CI: 9.00-10.48 respectively vs 8.33(2.45); 95% CI: 6.75-10.00, or 8.66(3.08); 95% CI: 8.09-9.24.(Table 3)

Table 2: Awareness about first-aid measures at time of seizures

Measures	Yes		No	
	n	%	n	%
Helpful measures				
Staying with them until ambulance arrives	484	96.8	16	3.2
Clearing the area of dangerous objects	491	98.2	9	1.8
Preventing them from falling	427	85.4	73	14.6
Loosening clothing around the person's neck	485	97.0	15	3.0
Taking them to hospital right after seizures	446	89.2	54	10.8
Putting a pillow under their neck	454	90.8	46	9.2
Rolling them carefully on their side	429	85.8	71	14.2
Potentially harmful measures				
Attempting to open the mouth to put something between jaws	392	78.4	108	21.6
Trying to restrain the person	349	69.8	151	30.2
Shouting and moving to wake them up	186	37.2	314	62.8
Sprinkling water on face to awaken them	238	47.6	262	52.4
Administering drugs orally	170	34.0	330	66.0
Pouring water with sugar into their mouth	181	36.2	319	63.8
Forcing water down their throat	149	29.8	351	70.2

Table 3: analysis of participants' total first aid measures score

	N	Mean	SD	F	95% CI		Sig
					lower	upper	
Sex							
Male	304	9.07	2.90	6.31	8.75	9.39	.012*
Female	174	9.76	2.89		9.30	10.18	
Marital status							
Married	223	8.90	2.62	5.63	8.54	9.24	.00**
Never Married	241	9.63	3.14		9.22	10.05	
Divorced	14	10.79	2.42		9.33	12.00	
Nationality							
Saudi	468	9.34	2.92	.82	9.06	9.62	.37
Non-Saudi	10	8.50	2.76		6.82	10.14	
Literacy							
Primary school	3	11.00	1.73	2.52	9.00	12.00	.04*
Middle school	9	8.33	2.45		6.75	10.00	
High school and diploma	111	8.66	3.08		8.09	9.24	
Bachelor	327	9.53	2.91		9.21	9.86	
Master and PhD	28	9.71	1.96		9.00	10.48	
Occupation							
Managers	50	9.78	2.23	2.08	9.12	10.36	.04*
Professionals	117	8.99	2.74		8.52	9.46	
Technicians	37	8.49	3.35		7.44	9.48	
Services and sales	11	8.00	3.92		5.64	10.06	
Machine operators	2	8.00	2.83		6.00	10.00	
Unemployed	26	9.38	2.91		8.33	10.44	
Student	168	9.84	3.05		9.35	10.26	
Housewife	38	9.37	2.34		8.60	10.14	
Other	29	8.45	3.07		7.31	9.57	

Independent sample t test and 2-way ANOVA, * Significant at 0.05.

M= Mean, SD= Standard Deviation, 95% CI= Confidence Interval.

seizures.

DISCUSSION

Awareness

This study examined public awareness of events and first aid actions at the onset of seizures in Taif, Saudi Arabia. The mean (standard deviation) awareness score for epilepsy symptoms was 6.33 (1.70). People reported that falling, loss of consciousness, and whole-body shaking were the most prevalent symptoms of seizures. The observable manifestations of seizures encompass a spectrum of manifestations, including tonic-clonic seizures characterized by uncontrolled shaking movements affecting the entire body and accompanied by loss of consciousness, focal seizures characterized by shaking movements limited to a specific part of the body and varying levels of consciousness, and absence seizures characterized by brief and subtle episodes of temporary loss of awareness, and it is possible to lose bladder control. (Misulis and Murray, 2017) Among these 500 individuals, 82 (16.4%) reported that Urinary incontinence cannot be an event at the onset of

The delivery of appropriate first aid is crucial in addressing seizures, since these events might manifest in many settings. Additionally, they assume a crucial function in the management of individuals and mitigating distressing circumstances. It is recommended that the healthcare professional accurately measure the duration of the seizure event and ensure the patient's safety by maintaining a stable and protected posture. When the attack is over, the patient should be placed in a recovery position and the level of awareness should be monitored. Hospitalization is not necessary for the patient until the seizure persists, particularly in cases when the patient has recurrent seizure episodes without recovering consciousness. (Alkhotani, 2022). According to our findings, the majority of respondents accurately answered that during epileptic convulsions, they should guarantee the patient's safety by cleaning the area of harmful objects and staying with them until an ambulance arrives. This discovery, however, presents a contradiction to prior research conducted in various areas of Saudi Arabia. These earlier studies indicated that although a majority of teachers expressed

confidence in their capacity to aid individuals undergoing a seizure, a significant number still exhibited incorrect practices or demonstrated an inability to effectively administer first aid to students experiencing genuine epileptic seizures. (Alqahtani, 2015, Alamri et al. 2018, Alamri and Al Thobaity, 2020)

The current study found a notable disparity in the mean (SD) total first aid measures score between male and female participants; the female participants mean (SD) was substantially higher than that of male participants. This discrepancy might perhaps be linked to the longstanding practice of segregating men and women in educational institutions, which is deeply rooted in Saudi Arabia's cultural and religious traditions influenced by Islam. The Ministry of Education in Saudi Arabia implements a policy of stringent gender segregation in educational institutions, ensuring the separation of male and female students. Notwithstanding their distinctiveness, educational institutions are subject to the same governmental authority and are obligated to adhere to the same regulations.

In terms of post-event treatment, the findings of this study show that approximately 86% of people agreed that carefully rolling the patients on their side after an epileptic seizure was the right step. Furthermore, in our survey, only about 10% of respondents answered wrongly regarding the criteria for opting to send the client for hospitalization. indicating that this area requires improvement.

Our study found a substantial association between individuals' personal qualities and their knowledge of first aid for epilepsy. However, the study conducted by Abulhamail et al. (2014) did not identify any significant correlations between teachers' knowledge of epilepsy and demographic factors such as age, gender, years of experience, or kind of institution. Research studies have shown that the dispersion of teacher knowledge among pupils is greater when educators possess higher levels of education and experience. Additionally, the possession of postgraduate degrees by instructors has been found to contribute to this phenomenon.

The present study revealed a significant correlation between individuals' personal attributes and their degree of familiarity with epilepsy first aid protocols. In contrast, the study conducted by Abulhamail et al. (2014) did not identify any significant associations between instructors' age, gender, years of experience, or institutional affiliation and their level of knowledge on epilepsy. Based on empirical study, it has been shown that a substantial body of information is influenced by two primary factors: increased professional experience and attainment of a postgraduate certification. Specifically, educators who possess a greater level of experience and higher educational attainment exhibit a higher degree of total knowledge acquisition. (Ba-Diop et al. 2014, Al-Ruwaili, 2019, Alkhotani, 2022, Alfaki, 2023) The disparity in study outcomes was most likely related

to the fact that our participants were public and had varying educational degrees.

CONCLUSIONS

The average awareness score for first aid measures during seizures was found to be 9.32 (SD = 2.91), suggesting that there is a widespread level of knowledge within the population about these procedures. The general public is also aware of the symptoms and events that occur during seizures. However, the study proposes that public awareness efforts and first-aid training courses should be used to improve knowledge and practice of epilepsy first aid.

First, because our study was limited to Taif, its findings may have limited generalizability. Second, because this is a cross-sectional study, the connections between variables mentioned may not be causal or explain the change in awareness and attitude in the source population over time

Supplementary materials

The supplementary material / supporting for this article can be found online and downloaded at: <https://www.isisn.org/article/10.3390/antiox12081524/s1>,

Author contributions

Conceptualization, methodology, validation, formal analysis, resources, data curation, writing-original draft preparation, writing-review and editing, visualization, all were done by the corresponding author M.A., All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The study was approved by Taif University's Research Ethics Committee

Informed Consent Statement

Not applicable.

Data Availability Statement

All of the data is included in the article/Supplementary Material.

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Conflict of interest

The authors declared that present study was performed in absence of any conflict of interest.

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