

Research Article

Awareness About Epilepsy Among Schoolteachers in the Northern Border Region, Saudi Arabia

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Abstract

Introduction: Epilepsy is a worldwide neurological problem. First aid management is essential to control the fits and minimize the complications. This study aims to evaluate the awareness of epilepsy among schoolteachers in the Northern Border Region, Saudi Arabia.

Methods: A cross-sectional study was conducted using a validated questionnaire in Arabic to assess awareness about epilepsy among schoolteachers in the Northern Border Region, Saudi Arabia. Descriptive and contingency statistics were used to assess the data collected.

Results: The study enrolled 366 teachers after they gave their consent. The majority were females (56%) and qualified by a bachelor's degree. (82%). Knowledge questions showed an overall average knowledge score of 3.4 ± 1.3 (ranging from 1-6). 212 participants (57.9%) had satisfactory knowledge scores (>3). The highest scores were given in questions about the etiology of epilepsy (93.7% correct responses), while the lowest level of correct answers was observed in the question about indications of hospitalization (24% correct responses). Place of work, years of experience, and positive family history of epilepsy or witnessing seized children significantly affect the knowledge scores (p -value = 0.008, 0.03, and <0.000 , respectively) with, significantly, more knowledge among younger-aged teachers and teachers working in primary schools.

Conclusion: Overall knowledge about epilepsy among schoolteachers is improving, but there is a need for more awareness activities and first aid training, which includes activities such as graduating schoolteachers from university programs.

Keywords: epilepsy, awareness, epileptic fits, first aid

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Production and Hosting by Knowledge E

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1. Introduction

Epilepsy is a common neurological disease, affecting around 50 million people [1]. Its estimated global prevalence rate was 6.38 per 1000 people in a 2016 meta-analysis study [2]. The prevalence of active epilepsy was estimated to be 3.96; 95% CI: [2.99-5.16]/1000 persons in 2023 [3]. In a study by Fiest et al. [4], a meta-analysis study published in 2017 about the worldwide prevalence of epilepsy showed that the overall prevalence of epilepsy was 7.60 per 1000 population (95% CI 6.17–9.38) and was higher in low-income countries (8.75 per 1000) than in high-income countries (5.18 per 1000).

The complications of uncontrolled epilepsy were reported to include damage to neuronal tissue, physiological abnormalities, psychological problems, physical trauma, and potentially fatal illnesses, including pneumonia and other causes of sudden death among epilepsy cases [5-7]. Moreover, the patients, their relatives, and their communities are all significantly impacted by this illness [8]. However, there is still insufficient adherence to epilepsy management [9].

Numerous studies have examined Saudi Arabians' broad awareness of epilepsy, with little emphasis on first-aid procedures [10-13]. Numerous myths and misconceptions regarding seizure first-aid techniques have been exposed by national and international research [14-16]. These include holding the patient down, letting them smell a specific scent, splattering water on their face, and forcing medication down their throat. Numerous local investigations revealed that instructors' understanding of seizure first-aid protocols was deficient [16-18]. Most importantly, epilepsy has a negative effect on a child's health, cognitive development, and academic success, as well as their mental health. Moreover, it is well known that the school years will greatly impact on the child's quality of life and potential adult roles. A teacher's knowledge and personal attitudes regarding epilepsy can greatly influence students' success, social skills development, and future employment. Teachers in schools serve as significant role models for kids and have a lasting impact. Children's academic performance might be impacted by their teacher's attitudes, especially if they have epilepsy [19]. Teaching is the most popular civilian career in Saudi Arabia. It draws individuals of diverse ages, genders, and socioeconomic backgrounds, as well as a range of educational backgrounds. In Saudi Arabia, relatively little research has been done to evaluate these concerns, even though the function of the teacher has a huge impact on these children's lives [20-22]. According to a recent study conducted in Saudi Arabia, Abulhamail et al., found that educational campaigns were necessary, and that primary school teachers' knowledge of epilepsy needed to be improved [22]. Hence the current study evaluates knowledge about epilepsy among schoolteachers in the Northern Border Region, Saudi Arabia.

2. Methods

The study was implemented as a survey-based cross-sectional study in the Northern Border Region, Saudi Arabia, during the period from February to March 2024. The study targeted the teachers in primary,

secondary, and high schools, private or public, in the study area. A validated self-administered Arabic questionnaire from a study measuring teachers' knowledge of seizure first aid in Jeddah, Saudi Arabia, was used [14]. The survey was divided into two sections: the first examined demographics (city, age, gender, nationality, and qualification), and the second asked six questions about teachers' understanding of epilepsy, seizures, and first aid. The participants were then asked about previous experiences with seizing students and the presence or absence of training about how to deal with epilepsy cases with fits. Schools were visited, and the questionnaire was distributed electronically to collect the data. Data collectors were then available to discuss the questions with the teachers to improve the awareness level. All the participants were asked to participate in our study while ensuring their privacy.

2.1. Sample Size

According to the official files in the Northern Border Directorate of Education, the total number of teachers recruited over the region's schools were 7140 teachers in all phases of primary, prep, and secondary schools. Epic sample size calculator was used with a 95% confidence interval and 5% expected error and anticipated 50% frequency using sample size calculation for a descriptive study model [23]. The expected sample for our study was estimated to be 355 teachers among all private and public schools at all levels in the Northern Border Region, Saudi Arabia. For sampling, 15 schools were visited randomly, covering the different sectors of education and different areas of the Northern Border region. We distributed a questionnaire to all the teachers who agreed to participate after understanding the study's purpose. The completed forms were then selected from teachers who answered all the questions.

The local bioethics committee of Northern Border University approved the study, with the decision number being 24/11/H and the date being January 31, 2024. The study team provided clarification to the participants and enrolled them in the study following their informed consent. Participants data were kept confidential throughout the study.

2.2. Statistical Analysis

Data entry was completed using Excel 2016 from Microsoft Office. The statistical study employed Chi-square analysis using the Statistical Package for the Social Sciences (SPSS) software, version 25 (Armonk, NY: IBM Corp). The threshold for statistical significance was set at P-values < 0.05. Participants scored 1 for correct answers and 0 for incorrect ones. Depending on 50% of the scores, participants who scored >3 were considered to have good knowledge. The Cronbach's alpha test checked the questionnaire's reliability. Logistic regression test was used to evaluate the individual effect of the different studied variables on the participants' awareness level.

3. Results

The current work evaluated the knowledge among teachers in Northern Border Region. We conducted the study from February to May 2024, enrolling 366 teachers after they gave their consent. The majority were females (56%) and qualified by bachelor's degree (82%) and around 58% of the teachers reported 5 years or less of working experience. Interestingly, 76.8% of the teachers enrolled in the study reported experience of epilepsy as family history of epileptic fits of their students. Table 1 displays the participants' demographic data in detail.

Table 1: Demographic data of the participants.

Parameters	Groups	Numbers	%
Gender	Female	205	56
	Male	161	44
Ages	≤29	46	12.6
	30-39	98	26.8
	40-49	173	47.3
	50-59	49	13.4
	≥60	0	0
Qualification	BSc	301	82.2
	MSc	51	13.9
	PhD	14	3.8
Place of work	Primary school	122	33.3
	Prep school	80	21.9
	Secondary school	164	44.8
Years of experience	≤5	212	57.9
	6-10	76	20.8
	>10	78	21.3
Experience with epilepsy	Family history or students with epilepsy	85	23.2
	No experience with epilepsy	281	76.8
Total		366	100

The Cronbach's Alpha test evaluated the questionnaire's reliability and scored it at 0.87, indicating satisfactory reliability. Knowledge questions showed an overall average knowledge score of 3.4 ± 1.3 (ranging from 1-6), with 212 participants (57.9%) having satisfactory knowledge scores (>3). The highest scores were given in questions about the etiology of epilepsy (93.7% correct responses), followed by the question about the viability of treatment (79.7% correct responses). The question about indication to hospitalization received the lowest level of correct answers, with only 24% correct responses. Participants' responses to the knowledge questions are shown in Table 2.

Table 2: Enrolled participants' responses to the knowledge questions about epilepsy in school children.

Question	Responses	Numbers	%	Right responses
What do you think of the etiology of epilepsy?	*Neurological disorder?	343	93.7	343 (93.7)
	Psychiatric disorder?	20	5.5	
	Demonic possession	3	0.8	
Is there any treatment available for epilepsy?	No	76	20.8	290 (79.2)
	*Yes	290	79.2	
Medication dependency?	No	107	29.2	259 (70.8)
	*Yes	259	70.8	
How do you deal with epilepsy patient during attacks?	Open her/his mouth and put gauze in it or clothing piece	95	26.0	265 (72.4)
	*Ensure safe place, ask help	265	72.4	
	Read Quran	6	1.6	
What is the right care after an epilepsy attack to be delivered?	Try to wake him up	43	11.7	284 (77.6)
	*Put on her /his side, ask help	284	77.6	
	Wash her / his face and give him water	36	9.8	
	Read Quran	3	0.8	
Hospital transportation	Immediately, if a seizure occurred	158	43.2	88 (24)
	*If it lasts more than 5 min	88	24.0	
	If it lasts more than 10 min	17	4.6	
	If it lasts more than 20 min	11	3.0	
	If I go back to him again and he doesn't wake up	15	4.1	
	A and B	43	11.7	
	B and C	34	9.3	

* means the correct answer

The demographic information collected had an interesting effect on the knowledge scores. A Chi-square test showed that young age, place of work, years of experience, and personal experience with epileptic cases all have a significant effect on the knowledge scores (p -value = 0.008, 0.03, <0.000, and 0.001, respectively), with young teachers working in primary schools having significantly more knowledge. The effect of the demographic variables on the knowledge score is shown in Table 3. A multivariable logistic regression model was used to investigate the effects of the three variables further. It showed that place of work [p -value = 0.003, odds ratio = 1.2 (95% confidence interval 1.07–1.32)] and a family history of epilepsy or seeing children seize [p -value < 0.000, odds ratio = 1.57 (95% confidence interval

1.47–1.65]] were the two most important factors affecting the knowledge scores of the people who were studied.

Table 3: The effect of the demographic variables on the knowledge score of the enrolled participants about epilepsy in school children.

Parameters	Groups	Numbers (%)	Knowledge scores		p-value
			≤3 Numbers (%)	>3 Numbers (%)	
Gender	female	205(100)	89(43.4)	116(56.6)	0.595
	Male	161(100)	65(40.4)	96(59.6)	
Ages	≤29	46(100)	16(34.8)	30(65.2)	0.008**
	30-39	98(100)	29(29.6)	69(70.4)	
	40-49	173(100)	86(49.7)	87(50.3)	
	50-59	49(100)	23(46.9)	26(53.1)	
Qualification	BSc	301(100)	126(41.9)	175(58.1)	0.984
	MSc	51(100)	22(43.1)	29(56.9)	
	PhD	14(100)	6(42.8)	8(57.1)	
Place of work	Primary school	122(100)	47(38.5)	75(61.5)	0.03*
	Prep school	80(100)	44(55)	36(45)	
	Secondary school	164(100)	63(38.4)	101(61.6)	
Years of experience	≤5	212(100)	67(31.6)	145(68.4)	<0.000***
	6-10	76(100)	31(40.8)	45(59.2)	
	>10	78(100)	56(71.8)	22(28.2)	
Experience with epilepsy	Family history or students with epilepsy	85(100)	22(25.9)	63(74.1)	0.008**
	No experience with epilepsy	281(100)	132(47)	149(53)	
Totals		366(100)	154 (42.1)	212 (57.9)	

*means p -value < 0.05, **means p -value < 0.01, ***means p -value < 0.001

Regarding the history of witnessing, 85 participants reported witnessing the seizing of students (23.2%). The history of witnessing seizing children was more significant among primary school children (p -value = 0.000). While only 140 participants (38.3%) said they had been trained in epilepsy first aid before, those younger than 40 years old were more likely to say they had (p -value = 0.001).

4. Discussion

Pediatric epilepsy is a chronic neurologic disorder that is highly common and can impact a child's family dynamics as well as their social and academic connections [19]. Numerous places have shown a deficiency of knowledge regarding epilepsy, as well as beliefs, anxieties, and the stigma associated with the disorder

[6-20]. This study aimed to evaluate teachers' understanding about epilepsy and how to treat seizures at all educational levels in the Northern Border Region of Saudi Arabia. Individuals with epilepsy may encounter various challenges in their daily lives, which can negatively impact their quality of life, including the need for immediate medical attention [19]. Therefore, educators need to be prepared to handle this illness and mitigate its impact on their students.

The current study showed that around 94% of the enrolled teachers understand the nature of epilepsy as a neurological disorder. This is higher than what was reported by AlMuslim et al., in the eastern province (87.5%). Our finding was in line with several research studies carried out in Saudi Arabia, which showed that most people do not know enough about epilepsy [10, 24, 25]. Nonetheless, a few research studies conducted in Jeddah and Jordan revealed that educators there had a mediocre understanding of and attitude toward epilepsy [17, 26]. Furthermore, most of our participants knew that epilepsy is a neurological disorder; this percentage was higher than that reported in Kuwait and Sudan and almost equivalent to that of other studies conducted in Makkah and Jordan [10, 26]. The findings of our study confirm our hypothesis about the lack of awareness and responsiveness to epilepsy and seizure first aid, which highlights the significance of starting appropriate educational programs about common illnesses. People in Saudi Arabia are much more aware of epilepsy now than they were in older studies when about half of the people surveyed said demonic possession was a cause of their condition. Only three people (0.8%) said it happened to them [27]. This proves the efficacy of the awareness activities.

The response consistency was evaluated by Cronbach's Alpha test, which was scored as 0.87 with satisfactory consistency. Knowledge questions showed an overall average knowledge score of 3.4 ± 1.3 (ranging from 1-5) with 212 participants (57.9%) having satisfactory knowledge scores (>3). In contrast, only 140 participants (38.3%) reported previous history of epilepsy-related training. This may be because other sources of awareness, such as government and social media, discussions with friends and family, healthcare professionals, and internet searches, had already raised participants' awareness. Training was more reported among the younger-aged teachers, which may have improved culture and attitude toward the importance of training, and some of them had attended online training sessions and lectures, which are not appealing for the older-aged participants. Given the expected abundance of epilepsy-related information, we should investigate and approve the reliability of these resources.

Merely 24% of our participants were aware of all the circumstances that require hospital transfer, which is crucial for the proper management of the cases. This aligns with the findings of previous studies [14, 17]. This finding suggests that teachers need to know more about when it is important to move pupils to the hospital.

The younger ages of the participants and teachers of primary school had shown significantly higher knowledge scores. The younger participants reported higher levels of training, which could explain this phenomenon. Also, primary school teachers reported a higher incidence of witnessing the fits among students, which may be attributed to febrile fits among students up to 7 years and early age of onset

of fits among children [28]. This experience is expected to raise their curiosity to get information about epilepsy.

The current study showed no significant difference in knowledge scores according to the teachers' qualifications. Other previous studies revealed that teachers with master's and doctorate degrees had higher knowledge levels [14, 17, 24]. The current finding may be due to a lack of extracurricular activities about first aid for school children's emergencies in the current education-related university programs. Therefore, we should consider this point as a recommendation, with the expectation that it will significantly improve teachers' awareness about epilepsy and other school emergencies.

There might have been some inevitable limits to the study, even though this article relies heavily on a satisfactory sample size, reasonable statistical analysis, and a thorough literature assessment to produce a well-rounded discussion, result presentation, and conclusion. The primary drawback is that the results of our study do not correspond to those of other, larger cities and rural locations, where people are likely to have less information and lean more toward superstitious ideas regarding epilepsy. Additionally, the study suffers from recall bias and sampling selection issues, which are common limitations of questionnaire-based data collection.

5. Conclusion

The current study aimed to evaluate instructors' knowledge of epilepsy and how to treat it among students at all educational levels in the Northern Border of Saudi Arabia. According to our survey, 57.9% teachers had good knowledge of epilepsy. This indicates that enrolled schoolteachers had satisfactory knowledge about epilepsy. However, being a lifesaving action, better awareness about first aid of seizing children among schoolteachers is required. Only 38.3% of respondents, meanwhile, reported having received first-aid training. This indicates a need for increased awareness to improve the skills and knowledge required for first responder training in schools. There is a particular need for first aid training to be provided to university graduates who are schoolteachers as part of their extracurricular activities. It is advised to conduct more research on Saudi Arabia's awareness about epilepsy.

Acknowledgment

None.

Statement of Ethics

The study was planned, conducted, and reported in accordance with the World Medical Association (WMA) Declaration of Helsinki.

Ethical Approval

The study was approved by the local Bioethics Committee of Northern Border University (Decision number:24/11/H, date: January 31, 2024).

Informed Consent Statement

After clarifying about the purpose of the study to the participants, they were enrolled in the study and written informed consent were obtained. Participants data were kept confidential throughout all the steps of the study.

Conflict of Interest

The authors declare that there is no conflict of interest.

Artificial Intelligence (AI) Disclosure Statement

AI-unassisted work.

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Author Contribution

SAA: Contributed to conception and design, data interpretation, and draft revision. SMMA, NKJA, DAA: Contributed to conception and design, data collection, and analysis. NFA, DMA: Contributed to conception and design, drafting of the article, and data analysis. EE: Contributed to conception and design, data interpretation, and critical revision for important intellectual content.

Data Sharing Statement

Data sets are included in the published article.

References

- [1] Al Rajeh S, Awada A, Bademosi O, Ogunniyi A. The prevalence of epilepsy and other seizure disorders in an Arab population: A community-based study. *Seizure*. 2001 Sep;10(6):410–414.
- [2] DeToledo JC, Lowe MR, Gonzalez J, Haddad H. Risk of aspiration pneumonia after an epileptic seizure: A retrospective analysis of 1634 adult patients. *Epilepsy Behav*. 2004 Aug;5(4):593–595.
- [3] Al Rumayyan A, Alharthi A, Al-Rowaili M, Al-Mehmadi S, Altwaijri W, Alrifai T, et al. The prevalence of active epilepsy in the Kingdom of Saudi Arabia: A cross-sectional study. *Neuroepidemiology*. 2023;57(2):78–89.
- [4] Ostendorf AP, Gedela S. Effect of epilepsy on families, communities, and society. *Semin Pediatr Neurol*. 2017 Nov;24(4):340–347.
- [5] Smithson WH, Hukins D, Buelow JM, Allgar V, Dickson J. Adherence to medicines and self-management of epilepsy: A community-based study. *Epilepsy Behav*. 2013 Jan;26(1):109–113.
- [6] Altowayan R, Aloqaily H, Almutairi A, Almassri R, Alharbi B, Alsallum G, et al. Level of awareness and attitudes toward epilepsy in Qassim, Saudi Arabia: A cross-sectional study. *Epilepsy Behav*. 2019 Jan;90:66–69.
- [7] Neyaz HA, Aboauf HA, Alhejaili ME, Alrehaili MN. Knowledge and attitudes towards epilepsy in Saudi families. *J Taibah Univ Med Sci*. 2016 Aug;12(1):89–95.
- [8] Cofano SC, Ojukwu D, Mozumdar N, Raza Z, Saigal S, Musku S, et al. Assessing knowledge of symptoms and first-aid care of epilepsy in Grenada, West Indies. *Epilepsy Behav*. 2017 May;70 Pt A:232–237.
- [9] Zhao T, Gao Y, Zhu X, Wang N, Chen Y, Zhang J, et al. Awareness, attitudes toward epilepsy, and first aid knowledge of seizures of hospital staff in Henan, China. *Epilepsy Behav*. 2017 Sep;74:144–148.
- [10] Alkhotani AM, Almalki WM, Alkhotani AM, Turkistani MA. Makkah female teachers' knowledge of seizure first aid. *Epilepsy Behav*. 2019 Sep;98 Pt A:10–13.
- [11] Kartal A, Akyıldız A. Public awareness, knowledge, and practice relating to epilepsy among adults in Konya. *Epilepsy Behav*. 2016 Jun;59:137–41.
- [12] Roberts RM, Farhana HS. Effectiveness of a first aid information video in reducing epilepsy-related stigma. *Epilepsy Behav*. 2010 Aug;18(4):474–480.
- [13] Kolahi AA, Abbasi-Kangevari M, Bakhshaei P, Mahvelati-Shamsabadi F, Tonekaboni SH, Farsar AR. Knowledge, attitudes, and practices among mothers of children with epilepsy: A study in a teaching hospital. *Epilepsy Behav*. 2017 Apr;69:147–152.
- [14] AlMuslim N, Aldawood M, Almulhim I, Alhaddad R, AlQahtani A, Almubarak A. Knowledge of epilepsy and seizure first aid among teachers in Eastern Province, Saudi Arabia. *Cureus*. 2023 Jan;15(1):e33418.
- [15] Alqahtani JM. Knowledge and practice of schoolteachers towards students with epilepsy in Khamis Mushate, Southern Saudi Arabia. *J Family Community Med*. 2015;22(3):163–168.

- [16] Al-Harbi AF, Alsaied LA, Parameswari PJ. Primary school female teachers' knowledge, attitude, and practice toward students with epilepsy in Riyadh, Saudi Arabia. *J Family Med Prim Care*. 2018;7(2):331–336.
- [17] Kanjo M, Najjar A, Bokhari AY, Alqarni GA, Darwesh EA, Alqarni GS. Knowledge of Epilepsy and seizure first aid among teachers in Jeddah, Saudi Arabia. *Epilepsy Behav Rep*. 2021 Aug;16:100475.
- [18] Al-Dosary AS, AlGhamdi FM, Almutairi BF, Alquwaiz IA, Alsomali AM, Algarni SA, et al. Public awareness of first-aid management of seizures in Saudi Arabia. *Epilepsy Behav*. 2022 Apr;129:108634.
- [19] Ojinnaka NC. Teachers' perception of epilepsy in Nigeria: A community-based study. *Seizure*. 2002 Sep;11(6):386–91.
- [20] Obeid T, Abulaban A, Al-Ghatani F, Al-Malki AR, Al-Ghamdi A. Possession by 'Jinn' as a cause of epilepsy (Saraa): A study from Saudi Arabia. *Seizure*. 2012 May;21(4):245–249.
- [21] Alaqeel A, Sabbagh AJ. Epilepsy; what do Saudi's living in Riyadh know? *Seizure*. 2013 Apr;22(3):205–209.
- [22] Abulhamail AS, Al-Sulami FE, Alnouri MA, Mahrous NM, Joharji DG, Albogami MM, et al. Primary school teacher's knowledge and attitudes toward children with epilepsy. *Seizure*. 2014 Apr;23(4):280–283.
- [23] Schaeffer RL, Mendenhall W, Ott L. *Elementary Survey Sampling*. 4th ed. Belmont (California): Duxbury Press; 1990.
- [24] Lh AR, Am Y, Wd AS, As AR, Aa S, Ym A, et al. Saudi teachers' knowledge and practices related to management of students with epilepsy. *Med J Cairo Univ*. 2019;87(3):763–768.
- [25] Alamri S, Alghamdi A, Al Quait A. What Saudi teachers know about epilepsy: A cross-sectional study of Tabuk City. *Epilepsy Behav*. 2018 Dec;89:169–172.
- [26] Alkhamra H, Tannous A, Hadidi M, Alkhateeb J. Knowledge and attitudes toward epilepsy among school teachers and counselors in Jordan. *Epilepsy Behav*. 2012 Aug;24(4):430–434.
- [27] Tayeb HO. Epilepsy stigma in Saudi Arabia: The roles of mind-body dualism, supernatural beliefs, and religiosity. *Epilepsy Behav*. 2019 Jun;95:175–180.
- [28] Guerrini R. Epilepsy in children. *Lancet*. 2006 Feb;367(9509):499–524.