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AWARENESS TOWARD EPILEPSY: ATTITUDE, MANAGEMENT, AND FIRST AID KNOWLEDGE OF SEIZURES

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ABSTRACT

Background: Medical doctors' knowledge and attitudes toward epilepsy play a crucial role in determining the quality of care, patient safety, and social integration of individuals with epilepsy. Inadequate awareness may lead to misdiagnosis, improper first aid, and suboptimal long-term management. This study aimed to assess the level of knowledge, attitudes, and perceptions regarding epilepsy presentation, diagnosis, treatment options, and seizure first aid among medical doctors in Iraq. **Methods:** A cross-sectional study was conducted using a structured, self-administered questionnaire distributed to 313 medical doctors across Iraq. The survey assessed demographic characteristics, knowledge of epilepsy diagnosis and management, awareness of first aid measures during seizures, and attitudes toward the social aspects of epilepsy. Participants varied in educational level, professional title, specialty, and workplace. Statistical analysis was performed to identify associations between knowledge levels and medical specialties. **Results:** A total of 313 respondents completed the questionnaire, with a mean age of 41.37 ± 10.86 years. Pediatric specialties constituted the largest group (52.4%). Overall, a low level of awareness was observed regarding epilepsy management, first aid, and attitudes. More than half of participants demonstrated insufficient knowledge of epilepsy diagnosis, with significant variation across specialties ($p < 0.05$). Knowledge of seizure first aid was inadequate in over 50% of respondents. Awareness of advanced treatment options was limited, particularly for vagus nerve stimulation (71.9%), ketogenic diet (54.3%), and epilepsy surgery (53.1%). Additionally, only 45% correctly identified lamotrigine as a safe option for myoclonic seizures. **Conclusion:** The study reveals substantial gaps in knowledge and attitudes toward epilepsy among medical doctors in Iraq, particularly regarding diagnosis, first aid, and advanced treatment modalities. These findings highlight the need for targeted educational and training programs to improve epilepsy care and patient outcomes.

KEYWORDS: Epilepsy, medical doctors, knowledge, attitudes, seizure first aid, epilepsy management, Iraq.

INTRODUCTION

Epilepsy is a chronic, non-communicable neurological disorder of the brain, defined by the occurrence of two or more unprovoked seizures. Seizures are transient episodes of abnormal neuronal activity that may manifest as involuntary movements affecting a specific part of the body (focal seizures) or involving the entire body (generalized seizures). These episodes may be associated with a wide range of clinical features, including loss of consciousness, impairment of bowel or bladder control, automatisms such as lip-smacking, and other involuntary motor or sensory phenomena.[1] Seizures result from excessive and synchronous electrical discharges of neurons in the brain; therefore, a seizure itself is not a disease entity but rather a symptom of underlying neurological dysfunction.[2] Epilepsy is among the most common neurological disorders worldwide, with a reported prevalence ranging from 2 to 10 per 1,000 populations, showing marked variation across different regions and countries.[3] Beyond its medical implications, epilepsy is strongly associated with social stigma and widespread misconceptions, affecting both educated and uneducated populations.[4] These negative perceptions often contribute to discrimination, social isolation, and delayed or inadequate treatment. Epilepsy affects individuals of all ages and genders and imposes

substantial physical, psychological, social, and economic burdens. The social stigma surrounding epilepsy significantly compromises quality of life and may hinder access to appropriate healthcare and social support.[5] The economic burden of epilepsy is frequently underestimated. Evidence from India demonstrated that the annual cost of epilepsy care per patient reached up to 88.2% of the national Gross National Product (GNP) per capita in 1998. Furthermore, in 2013, the total epilepsy-related costs—including direct medical expenses, transportation, and loss of productivity—exceeded 2.6 billion US dollars annually.[6] Healthcare professionals play a pivotal role in epilepsy care, not only through diagnosis and treatment but also by shaping patients' understanding and influencing societal attitudes toward the disease. Their level of knowledge directly affects patient education, first aid management during seizures, and public perception of individuals living with epilepsy.[5] Despite this importance, data from Iraq remain scarce. To date, no national or local studies have evaluated epilepsy prevalence, its financial burden, or healthcare professionals' awareness regarding epilepsy-related stigma, diagnosis, and active seizure management. According to the International League Against Epilepsy (ILAE), drug-resistant epilepsy is defined as the failure to achieve sustained seizure freedom after adequate trials of two well-tolerated and appropriately selected antiepileptic drug regimens, whether as monotherapy or in combination.[7] While most patients achieve seizure control with pharmacological therapy, approximately 20–30% remain refractory to medical treatment and may require alternative interventions such as epilepsy surgery, ketogenic diet, or vagus nerve stimulation.[8] Despite their clinical significance, these advanced treatment modalities are often under-recognized and insufficiently addressed in existing research. Therefore, this study aimed to assess medical doctors' awareness of epilepsy across multiple domains, including social aspects, clinical presentation, diagnosis, first aid management, and available treatment options, while examining variations according to educational level, specialty, professional title, and workplace in Iraq.

METHOD

A cross-sectional study was conducted between March and May 2023 to assess medical doctors' awareness, attitudes, and practices regarding epilepsy in Iraq. The study targeted medical doctors working in different Iraqi governorates and across various healthcare settings. Participation was voluntary, and only doctors who agreed to take part were included. Data were collected using a structured questionnaire administered in both paper-based format and as an electronic Google Form. The questionnaire was initially pilot-tested among a group of medical doctors to ensure clarity, relevance, and comprehensibility. Based on feedback from the pilot phase, necessary modifications were made before finalizing the questionnaire and converting it into the electronic format. The finalized questionnaire consisted of 26 items developed after an extensive review of relevant literature addressing epilepsy awareness, social stigma, diagnosis, treatment options, and seizure first aid management among healthcare professionals.[3–8] The survey was distributed from March to May 2023 to medical doctors across Iraq. The questionnaire was divided into six main sections: (1) demographic and professional characteristics, (2) social aspects of epilepsy including school, employment, and marriage, (3) awareness of epilepsy presentation, (4) knowledge of epilepsy diagnosis, (5) treatment options, and (6) awareness of first aid management during seizures. Demographic variables included age, gender, educational level (MBChB, Diploma, or Board), specialty (pediatrics, internal medicine, family medicine, neurology, neurosurgery, and others), professional title (senior, resident, rotator, or general practitioner), and current workplace (teaching hospital, general hospital, or primary healthcare center). Most items were close-ended. Twenty-one questions required yes/no responses, while the remaining questions were multiple-choice, allowing respondents to select more than one option to better assess depth of knowledge, attitudes, and perceptions toward epilepsy and its management. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Categorical variables were presented as frequencies and percentages, whereas continuous variables were expressed as mean ± standard deviation. Associations between categorical variables were assessed using Pearson's chi-square test or Fisher's exact test, as appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 313 medical doctors completed the questionnaire. The mean age of the respondents was 41.37 ± 10.86 years. Pediatricians constituted the largest specialty group, accounting for 52.4% of participants (n = 164), followed by family medicine physicians (19.8%, n = 62). Internal medicine specialists represented 9.6% of the sample (n = 30), while doctors from other specialties—including otorhinolaryngology, radiology, anesthesia, oncology, general surgery, pediatric surgery, and histopathology—accounted for 10.2% (n = 32). Regarding educational qualifications, the majority of participants held a Board degree (53%), followed by those with an MBChB degree (27.8%) and a Diploma (18.5%). In terms of professional titles, senior doctors represented the highest proportion of respondents (69.6%, n = 218), followed by residents (23.0%). Rotator doctors constituted 4.8% of the sample, while general practitioners had the lowest representation (2.6%). With respect to workplace distribution, most participants were employed in teaching hospitals (65.5%, n = 205). Doctors working in general hospitals accounted for 22.4% of the respondents, whereas those working in primary healthcare centers represented 12.1% of the sample. These demographic and professional characteristics are summarized in Table 1.

Table 1: Characteristics of participants in the survey		Frequency	percentage
Gender	male	161	51.4
	female	152	48.6
Specialty	Pediatric	164	52.4
	Internal medicine	30	9.6
	Family medicine	62	19.8
	Neurosurgery	3	1.0
	Neurology	7	2.2
	Others	32	10.2
	None	15	4.8
Educational level	Board	168	53.7
	Diploma	58	18.5
	MBChB	87	27.8
Professional title	Senior	218	69.6
	Resident	72	23.0
	Rotator	15	4.8
	GP	8	2.6
Current work	Teaching hospital	205	65.5
	General hospital	70	22.4
	PHC	38	12.1

The majority of participants agreed that patients with epilepsy can work and can go to public schools (80.5% and 89.5% respectively), whereas a significant number of participants were agreed that patients with epilepsy can drive a car or motorcycle and can Cook a food (21.7% and 78.9% respectively), as shown in (table 2). There were no significant differences within these results when compared with educational level, specialty, professional field, and current place of work. As in table 2.

Table 2: Social aspects of epilepsy (Yes/No) questions.		Frequency	percentage
Most patients with epilepsy can work?	Yes	252	80.5
	No	61	19.5
Most patients with epilepsy can go to public schools?	Yes	280	89.5
	No	33	10.5
Patients with epilepsy can drive a car or motorcycle.?	Yes	68	21.7
	No	245	78.3
Patients with epilepsy can Cook a food.?	Yes	247	78.9
	No	66	21.1
Happily, be a colleague or classmate of patients with epilepsy.?	Yes	235	75.1
	No	78	24.9
Would you be willing personally to: marry someone with epilepsy.?	Yes	66	21.1
	No	247	78.9

In general, there was a good recognition for most of seizures types. Some of epileptic events were labelled as non-epileptic by the participants. The most important one is auras and atonic seizures were identified as non-epileptic events and can pass undetected (48.2% and 22% respectively), as shown in (table 3). The majority of participants that goes with non-epileptic's answers were resident and rotator doctors (62.5% and 80% respectively [P value < 0.001]. there was no significant difference when compared with specialty and current work and educational level.

Table 3: Signs and symptoms of seizures? (Yes/No) questions.		Frequency	percentage
Sudden loss of muscle tone, may involve the head, trunk or limbs	Yes	244	78.0
	No	69	22.0
Abrupt onset and offset of altered awareness or cessation of activity	Yes	275	87.9
	No	38	12.1
A single or series of shock like limb jerks	Yes	281	89.8
	No	32	10.2
Repetitive motor activity like lip smacking, chewing, swallowing	Yes	280	89.5
	No	33	10.5

Abrupt onset of fear with upper abdominal pain	Yes	162	51.8
	No	151	48.2

There were significant number of participants choose wrong answers regarding epilepsy definition, diagnosis as shown in (table 4). However, there were general agreement that normal EEG would not exclude epilepsy There were no significant statistical differences when these results are compared with educational level, current work, Professional field. It was evident that there was a significant statistical difference between responders according to specialty when answering the question made for epilepsy diagnosis with great variation between them as shown in (table 5). the majority of participants with internal medicine (70%, p value < 0.014) choose wrong answers, whereas, (75.8%, p value < 0.0001) of participants with family medicine choose wrong answer for question 2, and (70.7%, p value < 0.0001) of pediatric participant choose wrong answer for question 3. as shown in (table 5).

Table 4: Epilepsy diagnosis (True/False) questions.	**Selected by participants**	**Frequency**	**percentage**
Q1: Two unprovoked seizures within 24 hours are sufficient to diagnose epilepsy and start long-term anti-seizure medications	True	137	43.8
	False	176	56.2
Q2: Presence of one unprovoked seizure plus MRI finding of old stroke is sufficient for diagnosis of epilepsy	True	135	43.1
	False	178	56.9
Q3: MRI should be done In all patients with first unprovoked seizure	True	140	44.7
	False	173	55.3
Q4: Normal EEG will exclude epilepsy	True	23	7.3
	False	290	92.7

Table 5: Response to the questions about epilepsy diagnosis among doctors according to specialty (True/False answer; the result shown with true answers only with n (%).

	Pediatric	**Internal Medicine**	**Family medicine**	**Neuro surgery**	**Neurology**	**Others**	**None (rotator)**	**P value**
Two unprovoked seizures within 24 hours is sufficient to diagnose epilepsy and start long-term anti-seizure medications	70 (42.7%)	21 (70%)	29 (46.8%)	1 (33.3%)	1 (14.3%)	8 (25.0%)	7 (46.7%)	0.014
Presence of one unprovoked seizure plus MRI finding of old stroke is sufficient for diagnosis of epilepsy	82 (50%)	17 (56.7%)	15 (24.2%)	2 (66.7%)	7 (100%)	9 (28.1%)	3 (20%)	0.0001
MRI should be done In all patients with first unprovoked seizure	48 (29.3%)	23 (76.7%)	39 (62.9%)	2 (66.7%)	3 (42.9%)	20 (62.5%)	5 (33.3%)	0.0001
Normal EEG will exclude epilepsy	10 (6.1%)	2 (6.7%)	5 (8.1%)	1 (33.3%)	0 (0%)	5 (15.6%)	0 (0%)	0.21

There were some wrong treatment practices for first aid knowledge of seizures by the doctors participating in the study as shown in (Table 6). *Non-pharmacological treatment*: a significant proportion of doctors 153(48.9%) would choose forcefully open the mouth during seizures, most of them were doctors with Diploma 37(68.4%), total number: 58, [P value < 0.006] and resident doctors 44(61.1%), total number: 72, [P value < 0.11]. 215 (68.7%) of participants were select insert an object between patient's teeth during the events of seizures, most of them were doctors with Diploma 50(86.2%), total number: 58, [P value < 0.006] and resident doctors 53(73.6%), total number: 72, [P value< 0.54]. There were no significant differences in gender, specialty, current place of work. *Pharmacological treatment*: there were incorrect understanding regarding the appropriate time to start first line (64.5%) and second line (22.0%) treatment for seizures, this finding wasn't associated with significant statistical differences in gender, specialty, current place of work, professional title and educational level.

Table 6: First aid knowledge of seizures (True/False) questions.	Selected by participants	Frequency	percentage
Press tightly the patient upper lip, forehead and fingers	True	42	13.4
	False	271	86.6
kept the patient in lateral position	True	306	97.8
	False	7	2.2
Forcefully open the mouth to avoid tongue biting	True	153	48.9
	False	160	51.1
Insert an object between patient's teeth	True	215	68.7
	False	98	31.3
Start diazepam after 5 minutes from the seizure onset in all patients	True	111	35.5
	False	202	64.5
Second line treatment like phenytoin should be started within 7 min from the seizure onset in all patients	True	69	22.0
	False	244	78.0

Epilepsy treatment options there was significant number of participant did not have enough knowledge about long term treatment options for epilepsy, namely for VNS 225(71.9%), ketogenic diet 170(54.3%), and brain surgery 166(53.1%). As shown in (Figure 2) and (Table 7).

Table 7: Response to the questions about epilepsy treatment options among doctors (the respondents could select more than one answer).

	Frequency	Percentage
Anti-seizure medication	311	99.4%
Brain surgery	147	47.0%
Acupuncture	29	9.3%
Ketogenic diet	143	45.7%
Herbal medicine or traditional healer	11	3.5%
Vagal nerve stimulation	88	28.1%

Interestingly, the participants with Diploma had the lowest percentage of respondents who answered yes to surgical options (32.8%, n = 19, total 58), followed by MBChB doctors (35.6%, n = 31, total = 87). Participants with Board had the highest percentage (57.7%, n = 97, total = 168). [p value < 0 .001] as shown in (Table 8). Internal medicine participants were more aware for brain surgery, and vagal nerve stimulation as treatment option for epilepsy, in contrast to Pediatrics group were more aware for ketogenic diet with statistical significance (p value < 0.0001) as shown in (Table 9). Carbamazepine was the most commonly selected treatment for focal epilepsy (62.3%), followed by levetiracetam (36.1%) and valproic acid (34.2%), while oxcarbazepine was least chosen. For generalized epilepsy, most participants correctly identified valproic acid as first-line therapy (70.3%). Misconceptions were noted, with carbamazepine and vigabatrin incorrectly considered safe for absence seizures and carbamazepine for myoclonic seizures. MBChB holders demonstrated significantly better awareness regarding inappropriate use of carbamazepine in myoclonic seizures compared with Board and Diploma holders (p < 0.004).

Table 8: Response to the questions about epilepsy treatment options among doctors according to educational level (the respondents could select more than one answer).

	Board	Diploma	MBChB	P value
Anti-seizure medications	168 (100%)	58 (100%)	85 (97.7%)	0.11
Brain surgery	97 (57.7%)	19 (32.8%)	31 (35.6%)	0.0001
Acupuncture	21 (12.5%)	4 (6.9%)	4 (4.6%)	0.1
Ketogenic diet	93 (55.4%)	18 (31%)	32 (36.8%)	0.001
Herbal medicine or traditional healer	9 (5.4%)	2 (3.4%)	0 (0%)	0.08
Vagal nerve stimulation	59 (35.1%)	11 (19%)	18 (20.7%)	0.01

Table 9: Responses to Epilepsy Treatment Options Among Medical Doctors According to Specialty.

Treatment option	Pediatrics n (%)	Internal Medicine n (%)	Family Medicine n (%)	Neurosurgery n (%)	Neurology n (%)	Other specialties n (%)	Rotator n (%)	P value
Anti-seizure medications	164 (100.0%)	29 (96.7%)	62 (100.0%)	3 (100.0%)	7 (100.0%)	31 (96.9%)	15 (100.0%)	0.19
Brain surgery	82 (50.0%)	17 (56.7%)	21 (33.9%)	3 (100.0%)	7 (100.0%)	13 (40.6%)	4 (26.7%)	0.001
Acupuncture	12 (7.3%)	3 (10.0%)	8 (12.9%)	1 (33.3%)	1 (14.3%)	4 (12.5%)	0 (0.0%)	0.39
Ketogenic diet	98 (59.8%)	8 (26.7%)	22 (35.5%)	1 (33.3%)	7 (100.0%)	4 (12.5%)	3 (20.0%)	0.0001
Herbal medicine / traditional healer	2 (1.2%)	1 (3.3%)	5 (8.1%)	0 (0.0%)	1 (14.3%)	2 (6.3%)	0 (0.0%)	0.159
Vagus nerve stimulation (VNS)	45 (27.4%)	12 (40.0%)	13 (21.0%)	3 (100.0%)	7 (100.0%)	5 (15.6%)	3 (20.0%)	0.0001

DISCUSSION

This study explored the awareness and attitudes of medical doctors in Iraq toward epilepsy, encompassing social aspects, clinical presentation, diagnosis, first aid management, and treatment options. The methodology was comparable to studies conducted in Saudi Arabia and other countries using similar survey tools, which likewise faced challenges related to survey delivery and response rates. Consistent with global findings, our results reinforce the need for enhanced educational initiatives to improve epilepsy awareness among healthcare professionals.[4,12,13,25] A prominent finding was the persistence of social stigma, as 78.9% of respondents were unwilling to marry a person with epilepsy, reflecting negative societal perceptions. Nonetheless, most participants demonstrated positive attitudes toward patients' participation in work, education, and social interactions, aligning with findings from Jordan and Saudi Arabia.[20,21] While the majority believed patients with epilepsy could safely cook food, a concerning proportion endorsed driving as permissible, despite its well-documented risks in uncontrolled epilepsy.[15,16] Clinically, recognition of common seizure types such as convulsive, absence, and myoclonic seizures was acceptable. However, substantial gaps were noted in identifying atonic seizures and auras, particularly among resident and rotator doctors, contrasting with higher recognition rates reported in China.[17] Diagnostic knowledge was also insufficient among a significant proportion of respondents, with marked variation by specialty rather than educational level, differing from findings in other regions.[17–19] First aid knowledge showed mixed results. Although most respondents correctly identified basic measures such as lateral positioning and avoiding physical restraint, many endorsed harmful practices, including forceful mouth opening and inserting objects between the teeth. These misconceptions were more frequent among Diploma holders and residents and mirror findings from Turkey and China.[4,17] Such gaps are concerning, given the frequency of seizures in hospital settings and the importance of prompt, appropriate intervention.

Regarding treatment, nearly all participants acknowledged the necessity of medical therapy. However, awareness of advanced treatment modalities—vagus nerve stimulation, ketogenic diet, and epilepsy surgery—was limited, similar to reports from the general public in Riyadh and Al-Kharj.[11,22] Internal medicine physicians showed relatively better awareness of surgical options, though small subgroup sizes may have influenced this finding. Comparatively higher awareness has been reported among medical students in Slovenia.[23] Overall, higher educational attainment (Board certification) was associated with better knowledge and attitudes, supporting the role of advanced training in reducing stigma and improving care. While general knowledge of first-line treatments for focal and generalized epilepsy was acceptable, significant misconceptions persisted regarding seizure-specific drug selection. The inappropriate selection of carbamazepine and vigabatrin for absence seizures and lamotrigine for myoclonic seizures is particularly concerning, given evidence that these agents may exacerbate certain seizure types and increase the risk of status epilepticus.[26–28] These findings underscore the urgent need for targeted educational programs focusing on seizure classification, first aid, and individualized treatment strategies to improve patient safety and outcomes.

CONCLUSION

The study highlights insufficient knowledge of epilepsy among Iraqi doctors, particularly regarding seizure manifestations and advanced treatment options. Board-certified physicians demonstrated higher awareness compared with Diploma and MBChB holders, indicating the impact of advanced training. Awareness of vagus nerve stimulation, ketogenic diet, and surgical management for refractory epilepsy remains limited and requires targeted educational interventions. Study limitations include a relatively small sample size and potential selection bias, warranting larger future studies involving the general population.

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