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Knowledge and Attitude Toward Epilepsy in Saudi Population

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Abstract— Epilepsy is a prevalent neurological disorder often associated with negative connotations. Due to the nature of epileptic seizures, a social stigma persists around epilepsy. Epilepsy is more prevalent among vulnerable populations, who might be more affected by the psychosocial consequences of this stigma. Enhancing familiarity with epilepsy could significantly reduce its associated stigma. Therefore, evaluating the public's knowledge and their attitudes toward the disease is essential. This study aims to assess the public's knowledge of epilepsy, their attitudes toward it, and to compare our findings with previous similar studies. A cross-sectional study was conducted in early 2022 using an online survey. The survey collected socio-demographic variables, general knowledge about epilepsy, and knowledge of first aid for seizures, and opinions and attitudes toward the disease. The survey was completed by 865 respondents, 465 of whom were males. The majority [82.3%] reported familiarity with the disease. Furthermore, most believed that epilepsy was not a barrier to employment [75%] or marriage [79.8%]. More participants were willing to hire someone with epilepsy [66.2%] than to marry someone with the condition [32.9%]. When questioned about their potential reactions to witnessing a seizure, the majority [N=674] reported that they would intervene. Our findings suggest that the public generally has a positive attitude toward epilepsy. However, there is a clear need to improve public understanding of first aid for seizures, which should be a focus of educational campaigns.

Keywords: epilepsy, awareness, knowledge, attitudes.

1. Introduction

Epilepsy, a widely prevalent neurological disorder, carries potentially negative connotations. [1] With a prevalence of 6.54 per 1000 in Saudi Arabia, [2]epileptic seizures often result from transient brain dysfunctions. [3] Despite their widespread recognition, seizures are frequently misunderstood, leading to societal stigmatization.[4,5]The nature and outward appearance of most seizures contribute to the social stigma associated with epilepsy.[3,7]Vulnerable population groups, including children and the elderly, experience a higher prevalence of epilepsy and these groups may face heightened psychosocial challenges following these transient epileptic attacks. [4]In certain cultures, epilepsy is mistakenly believed to be contagious, [6]while in others, it is wrongly associated with mental illness or intellectual disabilities. [3,4]

People's attitudes toward epilepsy are often guided by their understanding of the condition. [1]Globally, many associate epilepsy with non-medical, spiritual causes, [1,4] and such misconceptions have even been known to extend to healthcare providers. [5] Cross-sectional studies have found that knowledge and attitudes toward epilepsy can vary significantly by culture.[4] Multiple international studies have been conducted to assess knowledge of and attitudes toward epilepsy.[4-12]

Given that a deeper understanding of epilepsy would alleviate much of the stigma around it, [1,4,9] it is important to measure the public's knowledge and attitudes toward the condition, as well as their preparedness to assist during a seizure. Our objectives were to identify gaps in the Saudi public's awareness and perceptions, and highlight misconceptions that could be addressed in future educational campaigns.

2. Methods

2.1 Study Design

This is a community-based, cross-sectional survey of the public's awareness of and attitudes toward epilepsy.

2.2 Study Tool

A self-administered questionnaire gauged the public's awareness of and attitude toward epilepsy. An online link to the questionnaire was posted on various social media platforms. The questionnaire, divided into four sections, covered demographics [questions 1-6], general knowledge about epilepsy [questions 7-11], awareness and perception of epilepsy [questions 12-26] and specific knowledge of the disease [questions 27-37]. Questionnaire items were adapted from previous studies questions [10-13] and modified to accommodate some sociocultural nuances of Saudi Arabia. The items of the questionnaire were written in Arabic and English [Appendix].

2.3Data Analysis

Statistical analyses were performed using SPSS 21. Upon confirming data normality, Student's t-test and ANOVA were used to compare questionnaire responses across population subgroups. Average scores were calculated for knowledge, opinions and attitudes by assigning values to positive and negative responses. Negative responses were given zero points and positive responses were given either one point or two points if there was an "I don't know" option. Alpha was set at 0.05 to determine statistical significance.

2.4 Ethical Considerations

The study was approved by the Bioethics Committee of King Abdulaziz University Hospital [NCBE registration number HA-02-J-008]. Every participant provided informed consent before participating in the survey. Respondents' information and collected data are confidential and securely stored, accessible only to the study's authors.

3. Results

Table 1: Sociodemographic characteristics of respondents

Demographics	N=865	Frequency	%
Sex	□ Male.	476	55%
	□ Female.	389	45%
Age group	□ 18-29.	354	40.9%
	□ 30-39.	219	25.3%
	□ 40-49.	177	20.5%
	□ 50-59.	84	9.7%
	□ >60.	31	3.6%
Nationality	□ Saudi.	700	80.9%
	□ Non-Saudi.	165	19.1%
Parent	□ Yes.	464	53.6%
	□ No.	401	46.4%
Education	□ School.	242	28%
	□ University.	539	62.3%
	□ Postgraduate.	84	9.7%

Table 2: Respondents' familiarity with epilepsy

Question	Answer	Frequency	%
Have you ever heard of or read about the disease called epilepsy?	□ Yes. □ No.	712 153	82.3% 17.7%
Do you have epilepsy?	□ Yes. □ No.	26 839	3% 97%
Do you have a family member diagnosed with epilepsy?	□ Yes. □ No.	106 759	12.3% 87.7%
Have you ever seen someone having an epileptic seizure?	□ Yes, in a real-life setting. □ Yes, on a media platform. □ No.	524 189 152	60.6% 21.8% 17.6%

The survey was completed by 865 respondents. Males represented a slight majority [55%] of the participants. While respondents were from various age groups, the majority were under forty years old. Most respondents [80.9%] were Saudi nationals. Nearly half of the respondents were parents [53.6%]. The highest level of education achieved by most respondents was undergraduate university education [62.3%] while nearly 10% of respondents had postgraduate education as shown in Table 1. Table 2 shows responses related to familiarity with epilepsy. Most respondents[82.3%] reported having heard or read about epilepsy. Over half of the respondents[60.6%] had directly witnessed a seizure, while [21.8%] had seen a seizure presented on a media platform. Of the 865 respondents, 3% reported a personal diagnosis of epilepsy and 12.3% reported having a family member diagnosed with epilepsy.

Table 3: Respondents' background knowledge of epilepsy

Question	Answer	Frequency	%
What is your source of information about epilepsy? *	□ The internet. □ Family members. □ Television. □ Medical professionals. □ Books and journals. □ School. □ I don't recall.	436 220 214 169 146 143 124	50.4% 25.4% 24.7% 19.5% 16.9% 16.5% 14.3%
Is epilepsy a neurological disease?	□ Yes. □ No. □ I don't know.	599 40 226	69.2% 4.6% 26.1%
Is epilepsy a psychiatric disease?	□ Yes. □ No. □ I don't know.	134 434 297	15.5% 50.2% 34.3%
Is epilepsy an infectious disease?	□ Yes. □ No. □ I don't know.	9 799 57	1% 92.4% 6.6%
Is epilepsy an inherited disease?	□ Yes. □ No. □ I don't know.	337 154 374	39% 17.8% 43.2%
Which of the following do you think are causes of epilepsy?* ▪ Organic causes.	□ Organic. □ Psychological. □ Spiritual	320 42 3	37% 4.9% 0.3%

▪ Psychological causes. ▪ Spiritual causes.	□ Organic & psychological. □ Organic & spiritual. □ All three. □ I don't know.	242 37 48 173	28% 4.3% 5.5% 20%
What investigations are used to diagnose epilepsy?	□ Electroencephalography. □ Imaging. □ Psychological tests. □ Blood tests. □ I don't know.	553 40 35 13 224	63.9% 4.6% 4% 1.5% 25.9%
Who should treat epilepsy?	□ Medical professionals. □ Prayer. □ Herbalists. □ I don't know.	764 21 7 73	88.3% 2.4% 0.8% 8.4%

* Multiple choices are possible.

Table 3: illustrates responses regarding the background knowledge of epilepsy. The internet was the primary source of information about the disease for 50.4% of respondents, followed by family members [25.4%] and television [24.7%]. Regarding the nature of epilepsy, 69.2% correctly identified it as a neurological disease, while 39% considered it an inherited disease. Most respondents [92.4%] correctly dismissed the idea of epilepsy being an infectious disease. However, approximately half of the respondents [50.2%] dismissed epilepsy as a psychiatric disease. Regarding the etiology of epilepsy, 37% attributed epilepsy to organic causes and 28% associated it with organic and psychological causes. The cause of epilepsy was unknown to 20%. In terms of diagnosis, over half of the respondents [63.9%] correctly identified electroencephalography as the primary diagnostic tool for epilepsy, while imaging and psychological testing were chosen by 4.6% and 4%, respectively. Lastly, a vast majority [88.3%] believed medical professionals should be the ones treating epilepsy.

Table 4: Respondents' knowledge of seizure first aid

Response to witnessing a seizure *	Frequency	%
Move the person from danger.	606^	70.4%
Hold and fix the person in a seizure.	420	48.8%
Put a spoon or a cloth in the person's mouth.	363	42.2%
Force their medications down their throat	48	5.6%

* Multiple responses are possible, in a particular order.

^ 191 respondents [22.1%] chose this as the only answer.

Table 4 presents responses related to the first aid management of seizures. A commendable 70.4% rightly selected moving the person away from danger, though only 22.1% chose this as the sole correct action. In fact, 48.3% reported that they would also directly intervene. Nearly half of the respondents [48.8%] reported that they would restrain the person having a seizure, and 42.2% reported that they would put a spoon or a cloth in the person's mouth. Forcing medications down the throat of someone having a seizure was selected as first aid management for seizures by 5.6%.

Table 5: Respondents' opinions about epilepsy

Question	Answer	Frequency	%
Which of the following do you think is the most severe [depression, diabetes, epilepsy, headache, or heart failure] ?*	□ Heart failure. □ Depression. □ Epilepsy. □ Diabetes. □ Headache.	528 143 80 77 37	61% 16.5% 9.2% 8.9% 4.3%
Do you think the IQ of people with epilepsy is the same as that of the general population?	□ Yes. □ No. □ I don't know.	688 26 151	79.5% 3% 17.5%
Do you think epilepsy is an obstacle to academic achievement?	□ Yes. □ No. □ I don't know.	39 760 66	4.5% 87.9% 7.6%
Do you think epilepsy is a barrier to employment?	□ Yes. □ No. □ I don't know.	113 649 103	13.1% 75% 11.9%
Do you think epilepsy is a barrier to military service?	□ Yes. □ No. □ I don't know.	435 218 212	50.3% 25.2% 24.5%
Do you think epilepsy is a barrier to driving?	□ Yes. □ No. □ I don't know.	485 173 207	56.1% 20% 23.9%
Do you think epilepsy is an obstacle to marriage?	□ Yes. □ No. □ I don't know.	68 690 107	7.9% 79.8% 12.4%
Do you think epilepsy is an obstacle to having children?	□ Yes. □ No. □ I don't know.	36 684 145	4.2% 79.1% 16.8%
Do you think society treats people with epilepsy with stigmatization?	□ Yes. □ No. □ I don't know.	152 290 423	17.6% 33.5% 48.9%

Table 5: presents responses reflecting opinions about epilepsy as a disease. Out of five chronic diseases, 9.2% ranked epilepsy as the most severe. Heart failure and depression were ranked the most severe by 61% 16.5% of respondents, respectively. Most respondents [79.5%] believed that the IQ of people with epilepsy parallels that of the general population, while over a quarter of respondents [17.5%] were unsure. Only 3% disagreed with this notion. Most respondents did not consider epilepsy an obstacle to academic achievement or employment [87.9% and 75%, respectively], while over half of the respondents deemed epilepsy a barrier to military service and driving [50.3% and 56.1%, respectively]. Opinions on societal stigmatization were divided, with 48.9% being neutral, and 33.5% believing individuals with epilepsy aren't stigmatized.

Table 6: Respondents' attitude toward epilepsy.

Attitude-related question	Answer	Frequency	%
What would be your reaction if a family member was diagnosed with epilepsy?*	□ Read about the disease. □ Conceal the diagnosis from others. □ I Would do both.	660 57 51 97	76.3% 6.6% 5.9% 11.2%

	□ I don't know.		
Would you like to know more about epilepsy?	□ Yes. □ No.	731 134	84.5% 15.5%
Would you hire someone with epilepsy?	□ Yes. □ No. □ I don't know.	573 72 220	66.2% 8.3% 25.4%
Would you marry someone diagnosed with epilepsy?	□ Yes. □ No. □ I don't know.	285 281 299	32.9% 32.5% 34.6%
Would you be accepting of a family member of yours marrying someone with epilepsy?	□ Yes. □ No. □ I don't know.	275 253 337	31.8% 29.2% 39%

* Multiple choices are possible.

Table 6 presents responses reflecting attitudes toward epilepsy and those diagnosed with it. On learning of a family member's diagnosis, 76.3% favored educating themselves about the condition through reading. Of these, 5.9% reported that they would also conceal the diagnosis from other people. Additionally, another 6.6% selected concealing the diagnosis from others as their choice of appropriate response to the news of the diagnosis. Most respondents [84.5%] reported that they wanted to know more about epilepsy. On the employment front, 66.2% reported they would hire someone diagnosed with epilepsy. However, when it came to personal relationships, fewer respondents said they were willing to marry someone diagnosed with epilepsy [32.9%]. Even fewer respondents said they would be accepting of a family member marrying someone with epilepsy [31.8%].

Table 7: Level of knowledge, opinions & attitude as per respondents' characteristics

Variable	Mean knowledge score	Standard deviation	P-value	Mean opinion & attitude score	Standard deviation	P-value
Gender						
□ Male.	0.96	0.2	**0.05**	1.4	0.3	**0.01**
□ Female.	0.99	0.2		1.5	0.3	
Age group						
□ 18-29.	0.96	0.22		1.4	0.3	
□ 30-39.	0.98	0.2	0.08	1.4	0.3	0.5
□ 40-49.	1	0.2		1.4	0.3	
□ 50-59.	0.98	0.2		1.4	0.3	
□ >60.	0.92	0.2		1.4	0.3	
Education						
□ School.	0.96	0.2		1.4	0.3	
□ University.	0.97	0.2	**0.01**	1.4	0.3	0.6
□ Postgraduate	1	0.2		1.4	0.3	
Family member with epilepsy.						
□ Yes.	1	0.2	0.1	1.4	0.3	
□ No.	0.97	0.2		1.4	0.3	0.5

Table 7 shows the level of knowledge and attitude as per respondents' characteristics. There were statistically significant differences in both knowledge and attitude between males and females. Female respondents had overall higher positive scores in both categories compared to their male counterparts. There was no statistically significant difference between the five age groups in the study in either knowledge or attitude. The level of education had a statistical significance on knowledge scores, but not on attitude. Interestingly, having a family member diagnosed with epilepsy had made no statistically significant difference on the level of knowledge or attitude.

4. Discussion

Attitudes toward people with epilepsy are often influenced by peoples' understanding and knowledge of the disorder [4,13]. In the current study, 82% of respondents had heard or read about epilepsy. A study that examined Canadian university students' knowledge and attitudes regarding epilepsy reported that 91% of students had heard or read about epilepsy [4]. This might be due to the sample in the current study being from various age groups and educational backgrounds compared to the Canadian study that included only young adult university students [4]. Nevertheless, the percentage reported in the current study is lower than the percentages reported by previous international studies [14-19]. This suggests a lack of exposure to medical information. Interestingly, our results showed that 12.3% of respondents reported having a family member diagnosed with epilepsy, and 3% reported they had themselves been diagnosed with epilepsy. This is considerably higher than the general prevalence of epilepsy in Saudi Arabia, estimated at around 0.7% [19]. This may be attributed to the study tool utilized in the study. It is hypothesized that respondents of a survey may not be representative of a population as mere participation in a survey might reflect an inherent interest in the subject or a connection to it [20]. Additionally, over half of the respondents reported having witnessed a seizure in real life, whereas a lower percentage had been reported in a previous international study that collected data through stratified random sampling [10]. Although our sample may be more connected to epilepsy than a random sample, medical professionals were not a major source of information about the disease for our respondents. In fact, the internet was the most prominent source of information about the disease.

The respondents' background knowledge of the disease was overall positive but highlighted areas for improvement. Over a quarter of the respondents were not certain whether epilepsy was a neurological disease or whether it was not a psychiatric disease. Responses to the diagnosis of epilepsy reflected better knowledge of the procedural diagnostic measures than the nature of the disease. Most respondents believed that epilepsy should be managed by medical professionals, but the reluctance to choose this by the remainder of respondents might reflect a lack of confidence in the medical establishment. Saudi epilepsy patients are reported to be drawn to complementary and alternative therapies [1]. The cause for this cultural dissatisfaction with modern medicine needs further investigation.

Regarding first aid for seizures, our findings resonated with a study in China where a significant knowledge gap existed [13]. Most respondents reported that they would interfere, for example, by restraining the patient or putting an object inside the patient's mouth. Only 22.1% of respondents selected that they would only move the person from danger.

Attitudes toward people with epilepsy may be affected by its past association with possession and mental illness [4]. In the current study, most respondents had positive opinions regarding academic achievement, marriage, having children and employment. The responses concerning these aspects are generally more favorable than in other previous international studies [10 &13]. Additionally, most respondents reported a

willingness to learn more about epilepsy. Furthermore, most respondents reported that they would read up on the disease following a family member's diagnosis. Fewer respondents reported that they would conceal the diagnosis compared to a previous international study [13].

However, opinions regarding the ability to drive and serve in the military were less positive, as were attitudes toward personally marrying or having a family member marry someone with epilepsy. The findings from previous international studies regarding these aspects were variable [4, 12, 13, 22 & 25].

Contrary to a previous international study in which epilepsy was perceived to be less severe than diabetes and more severe than depression [10], epilepsy was ranked the most severe of the other four diseases, including diabetes, by a small percentage of our respondents . This perception might be related to the familiarity of the Saudi public with the highly prevalent diabetes mellitus and perhaps less familiarity with depression and epilepsy [21]. Of note, in the current study, a family member diagnosis had no statistical significance on either knowledge or attitude.

Interestingly, female respondents showed greater knowledge and a more positive attitude, a finding supported by a previous study [4]. Meanwhile, education had a positive effect on knowledge but not attitude. This should not undervalue the effect of knowledge on attitude. In a study in Canada, brochure-exposed university students had a better attitude toward epilepsy compared to those who had not been exposed to the brochure [4]. One study has attributed New Zealanders' high level of awareness of epilepsy to the intensive education campaign conducted since the sixties of the last century by the Epilepsy Association of New Zealand [8]. Additionally, it is suggested by another study that knowledge is not a separate predictor of positive attitude [23]. Familiarity with the disease combined with knowledge together serve as predictors of a positive attitude [24].

5. Conclusion and Recommendations

This study reflectsthe Saudi population's familiarity with epilepsy and a generally positive attitude regarding employment and education. However, gaps in knowledge and certain unfavorable attitudes persist. The most pronounced of these pertains to marriage and seizure first aid. Educational campaigns are encouraged to improve the public's knowledge and attitude toward epilepsy. Leveraging the internet for such a purpose is important, given its dominance as an information source.

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8. Appendix

Study Information sheet	This study is conducted by the College of Medicine in Rabigh - King Abdulaziz University, to measure public awareness of epilepsy using a self-administered questionnaire. The study is aimed for the public, who are eighteen (18) years old or older. It takes 5 minutes to fill in the questionnaire. The aim of this study is to measure public awareness regarding epilepsy. All information is confidential. The study does not require any data that reveals the identity of the respondents. Do you agree to participate in this survey? □ Yes. □ No.
Background information	Age: …….. Gender: □ Male. □ Female. Marital status: □ Married. □ Unmarried. Nationality: □ Saudi. □ Non-Saudi. Do you have children? □ Yes. □ No. Education: □ Secondary school.

	□ University. □ Postgraduate.
General knowledge of epilepsy	Do you have epilepsy? □ Yes. □ No. Do you have a family history of epilepsy? □ Yes. □ No. Have you ever heard of or read about the disease called epilepsy? □ Yes. □ No. Have you ever seen anyone having an epileptic seizure? □ Yes, in a real-life setting. □ Yes, on TV. □ No, I haven't seen someone having a seizure. What is your source of information about epilepsy? □ The internet. □ Parents and family members. □ Medical professionals. □ Books and newspapers. □ TV. □ School. □ I can't remember.
Awareness and perception of epilepsy	I would like to have more information about epilepsy. □ Yes. □ No. Do you think epilepsy is an impediment to driving? □ Yes. □ No. □ I don't know. Do you think epilepsy is an impediment to employment? □ Yes. □ No. □ I don't know. Would you hire someone with epilepsy? □ Yes. □ No. □ I don't know. Do you think epilepsy is an impediment to military service? □ Yes. □ No. □ I don't know. Do you think epilepsy is an impediment to academic achievement?

	☐ Yes. ☐ No. ☐ I don't know. Do you think people with epilepsy have lower IQ than those of the population? ☐ Yes. ☐ No. ☐ I don't know. Do you think epilepsy is an impediment to marriage? ☐ Yes. ☐ No. ☐ I don't know. Do you think epilepsy is an impediment to having children? ☐ Yes. ☐ No. ☐ I don't know. Would you marry someone with epilepsy? ☐ Yes. ☐ No. ☐ I don't know. Would you be okay with a relative of yours marrying someone with epilepsy? ☐ Yes. ☐ No. ☐ I don't know. Do you think society treats epilepsy patients with stigmatization? ☐ Yes. ☐ No. ☐ I don't know. How would you react if a family member had epilepsy? ☐ Conceal the diagnosis so that they wouldn't be discriminated against. ☐ Read about epilepsy. ☐ I don't know.
Specific knowledge of epilepsy	Is epilepsy a neurological disease? ☐ Yes. ☐ No. ☐ I don't know. Is epilepsy a psychiatric disease? ☐ Yes. ☐ No. ☐ I don't know. Is epilepsy contagious? ☐ Yes. ☐ No. ☐ I don't know. Is epilepsy hereditary? ☐ Yes. ☐ No.

- I don't know.

Which of the following are causes of epilepsy?

- Organic.
- Psychological.
- Spiritual
- Organic & psychological.
- Organic & spiritual.
- All three.

I don't know.

What investigations are used to diagnose epilepsy?

- Imaging.
- Electroencephalogram.
- Blood tests.
- Psychological tests.
- I don't know.

Who do you think should treat epilepsy?

- Medical doctors.
- Herbalists.
- Prayer.
- I don't know.

Based on your opinion, rank the following diseases in order of increasing severity from the least severe (1) to the most severe (5)

Disease	1 least severe	2	3	4	5 most severe
Heart failure					
Epilepsy					
Diabetes					
Headache					
Depression					

What would you do if someone were having a seizure?

- Promptly move the person away from danger.
- Put a spoon or cloth in the patient's mouth.
- Force his/her medicine down the throat.
- Splash some water.
- Hold/fix them.