

RESEARCH ARTICLE

Epilepsy knowledge, awareness, and attitudes among pharmacy students in a private university in Lebanon: A cross-sectional study

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Abstract

Introduction: This study aimed to determine the knowledge, awareness, and attitudes regarding epilepsy among undergraduate pharmacy students in a Lebanese private university. **Methods:** A cross-sectional descriptive study was conducted through a web-based questionnaire that was sent to 251 pharmacy students. Data related to demographic characteristics and understanding of epilepsy were collected. **Results:** Around 58% of the students completed the questionnaire, with a mean age of 20.5 years and the majority being females (80%). Most students believed that the origin of epilepsy is neurological (93%). About 47% were aware of the types of seizures. Lectures were the most relevant source of information (64%). The majority of respondents (97%) knew that treatment of epilepsy is mainly by using medications. **Conclusion:** This study reflected a satisfactory level of awareness and knowledge of epilepsy among undergraduate pharmacy students, however, there is a need to improve certain aspects of understanding of epilepsy.

Introduction

Epilepsy is a chronic serious brain disease defined as a condition of recurrent unprovoked seizures due to hypersynchronous, hyperexcited neuronal activity (Falco-Walter *et al.*, 2018). Clinical manifestations vary depending on the area of the brain from which the electrical activity originated, resulting in transient alteration in behaviour and sensation with or without loss of consciousness (Kabir *et al.*, 2005). Epilepsy is the most common non-communicable neurological disorder affecting both sexes and all age groups. Epilepsy accounts for a significant proportion of the global disease burden; around 50 million people worldwide suffer from epilepsy, and almost 80% of

them reside in low- and middle-income countries, where it is estimated to have 139 per 100,000 people are diagnosed with epilepsy each year (Bhesania *et al.*, 1969; Bahou *et al.*, 2020; Epilepsy: A Public Health Imperative, n.d.). In the Arab world, it was demonstrated that around 724,500 persons had epilepsy (Benamer & Grosset, 2009). However, no accurate statistics exist in Lebanon, as some patients, especially those from low socioeconomic status, either refuse to consider epilepsy as a medical condition or hide it due to the associated social stigma (Salame & Mikati, 2017).

Most patients with epilepsy face many social challenges, mainly stigma and discrimination, that cause more suffering than the disease itself (Jacoby,

2002; Pandian *et al.*, 2006). As a result, they have significant socioeconomic and psychological problems, and they often have difficulties in getting proper education and employment, leading an active social life, and getting married, thus negatively influencing their quality of life (Dantas *et al.*, 2001; Adoukonou *et al.*, 2015; Ak *et al.*, 2015; Epilepsy According to the Christian, Jewish and Islamic Religions, n.d.; Shoukat & Iqbal, 2019). Lack of appropriate information about epilepsy is most probably one of the main factors leading to stigma and discriminatory attitudes toward epileptic patients (Jacoby, 2002; Ak *et al.*, 2015).

Acquiring appropriate knowledge and education about epilepsy is an extremely important step in dispelling the misconceptions and improving awareness and attitudes concerning this disease (Pandian *et al.*, 2006; Paschal *et al.*, 2007). Previously conducted studies have demonstrated that better-educated people show more positive attitudes and better perception of epilepsy (Jensen & Dam, 1992; Chung *et al.*, 1995; Mirnics *et al.*, 2001; Fong & Hung, 2002; Hills & MacKenzie, 2002). University students, specifically pharmacy students, represent a better-educated group of the society in regard to educating patients about their diseases and their proper management. Therefore, these future healthcare professionals, who will be playing a significant role in providing care for epileptic patients, are expected to acquire appropriate knowledge and to have positive attitudes towards epilepsy and antiepileptic medications (Rahman, 2005).

Accordingly, the current study aimed to assess the knowledge, awareness, and attitudes regarding epilepsy among undergraduate pharmacy students at the Lebanese International University, a private university in Lebanon.

Methods

This cross-sectional study was conducted at the Lebanese International University, Bekaa Campus, the only university offering a pharmacy programme in Bekaa Valley, Lebanon. The study was carried out between December 2017 and February 2018 and included first to fifth year undergraduate pharmacy students who were registered in the autumn term during the academic year 2017-2018.

The survey instrument was a web-based questionnaire generated following a detailed review of other previously conducted similar studies (Rahman, 2005; Caixeta *et al.*, 2007; Falavigna *et al.*, 2009; Gedefa *et al.*, 2012; Thapa *et al.*, 2017). It was written in English, the language of instruction at the school, and consisted of

two sections. The first section concerned students' demographics, such as age, gender, current year of study, nationality, marital status, working status and monthly family income. The second section comprised a series of questions that sought to assess students' knowledge and understanding of the origin, causes, types, clinical manifestations, first aid measures and treatment options of epilepsy, in addition to questions assessing students' perception and attitudes toward epilepsy and epileptic patients. To ensure validity, the questionnaire was initially peer-reviewed by a group of experienced pharmacy faculty members and then piloted among ten undergraduate pharmacy students who were later excluded from the final analysis. All of the faculty and students' feedback and comments were taken into consideration, and the final version of the questionnaire was adjusted accordingly. The study was approved by the Institutional Review Board of the School of Pharmacy at the Lebanese International University.

The questionnaire was designed to be completed in less than ten minutes, and it was sent to all pharmacy students via their university emails after explaining the study's scope and purpose in the body of the email. Participants were assured that their responses would be anonymous and confidential and never associated with any information that could identify them personally. They were also informed that their participation in the survey is voluntary, and they may decide not to complete the survey at any time while filling it. Data obtained from this survey were coded, entered, and analysed using the Statistical Package for Social Sciences (SPSS) version 22.0. Frequencies and percentages were used to represent categorical variables. The Chi-square test was used to identify correlations and significant differences amongst participants' responses, with significance defined as *p* value < 0.05.

Results

A total of 251 students were enrolled in the School of Pharmacy at the Lebanese International University, Bekaa Campus, during the autumn term of 2017-2018. Of those, 146 students responded to the questionnaire yielding a response rate of 58%. Their mean age was 20.51 ± 2.49 years, with the majority being females (80.1%). Data analysis revealed that 48% of the participants were enrolled in their pre-professional (pre-PHAR) years (first and second year students) while the rest (52%) were professional (PHAR) year students in their third, fourth, and fifth year of study. Most of the respondents were Lebanese (85.4%), single (87.6%),

nonalcoholics (95.9%), and nonsmokers (84.2%). The complete demographic results are shown in Table I.

Table I: Demographic characteristics of respondents (n=146)

Variable	Frequency	Percentage
Age (mean ± S.D.)	20.51 ± 2.49	
Gender		
Male	29	19.9
Female	117	80.1
Year of Study		
First year	42	28.8
Second year	28	19.2
Third year	22	15.0
Fourth year	27	18.5
Fifth year	27	18.5
Nationality		
Lebanese	125	85.6
Non-Lebanese	21	14.4
Marital Status		
Single	128	87.6
Married	3	2.1
In a relationship	15	10.3
Occupation		
Not working	131	89.7
Working	15	10.3
Alcoholic		
Yes	6	4.1
No	140	95.9
Smoker		
Yes	23	15.8
No	123	84.2
Family Income		
< 500\$	4	2.7
500-1500 \$	59	40.4
> 1500\$	83	56.9
Health Insurance		
NSSF	50	34.2
COOP	6	4.1
Private	30	20.6
None	60	41.1

NSSF: National Social Security Fund; COOP: Lebanese Cooperative

Only 20 out of 146 respondents (13.7%) declared that their knowledge about epilepsy is advanced. The majority of students (93.1%) believed that epilepsy was neurological in origin, and almost half of them (47.3%) were aware of the different types of seizures and that the clinical manifestations were not identical among these types (78.7%). As for the causes of epilepsy, 87% of the participants claimed it was due to brain disease, 54.1% due to exposure to toxic substances or medications, 43.2% due to high fever, and 25.3% due to depression. Few students had personal contact with epileptic patients where 13% had a relative, 8.2% a colleague, and 6.8% had a close friend suffering from epilepsy, and almost one quarter (26%) had previously witnessed a seizure episode, as shown in Table II.

Table II: Participants' basic knowledge about epilepsy

Question	Frequency	Percentage
How would you assess the information you currently have on epilepsy?		
Advanced	20	13.7
Average	65	44.5
Insufficient	48	32.9
None	13	8.9
The origin of epilepsy is:		
Psychological	5	3.4
Neurological	136	93.1
Psychiatric	2	1.4
Others	3	2.1
Do you know how many types of seizure are there?		
Yes	69	47.3
No	46	31.5
Do not know	31	21.2
Do you think that the clinical manifestation is the same for all types of epilepsy?		
Yes	8	5.5
No	115	78.7
Do not know	23	15.8
What are the causes of epilepsy?		
Headaches	27	18.5
Brain disease	127	87.0
Bad thoughts	7	4.8
Evil spirit	3	2.1
Parasites	12	8.2
Depression	37	25.3
High fever	63	43.2
Complications during childbirth	63	43.2
Toxic substances/medication	79	54.1
Alcoholism	43	29.5
Do patients with epilepsy have any limitations?		
Yes	104	71.2
No	42	28.8
Do you have any relative with epilepsy?		
Yes	19	13.0
No	127	87.0
Do you have any close friend with epilepsy?		
Yes	10	6.8
No	136	93.2
Do you know anyone at work/class with epilepsy?		
Yes	12	8.2
No	134	91.8
Have you ever witnessed a seizure episode?		
Yes	38	26.0
No	108	74.0

Lectures delivered during the pharmacy degree programme were found to be the most relevant source of information (63.7%), followed by books and magazines (33.6%), as shown in Figure 1. As first aid for helping an individual during a seizure attack, the majority (80.1%) would remove any nearby sharp objects, 69.9% would protect the head, 26.7% would

place the head on one side, 26% would stay close to the individual, and 21.9% would hold the tongue. Almost three-quarters of the respondents (78.1%) claimed that they had a desire to help when seeing an individual having a seizure, while 16.4% would feel frightened.

Results also revealed that most of the respondents (97.3%) knew that the treatment of epilepsy is mainly by medications, while 21.9% thought that they needed psychiatric care, as shown in Figure 2.

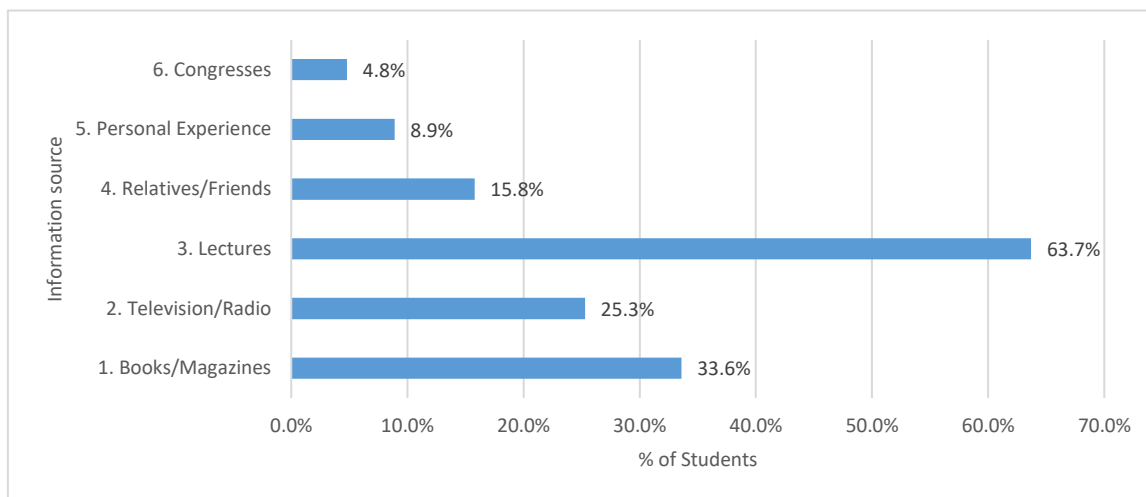


Figure 1: Respondents' source of knowledge about epilepsy

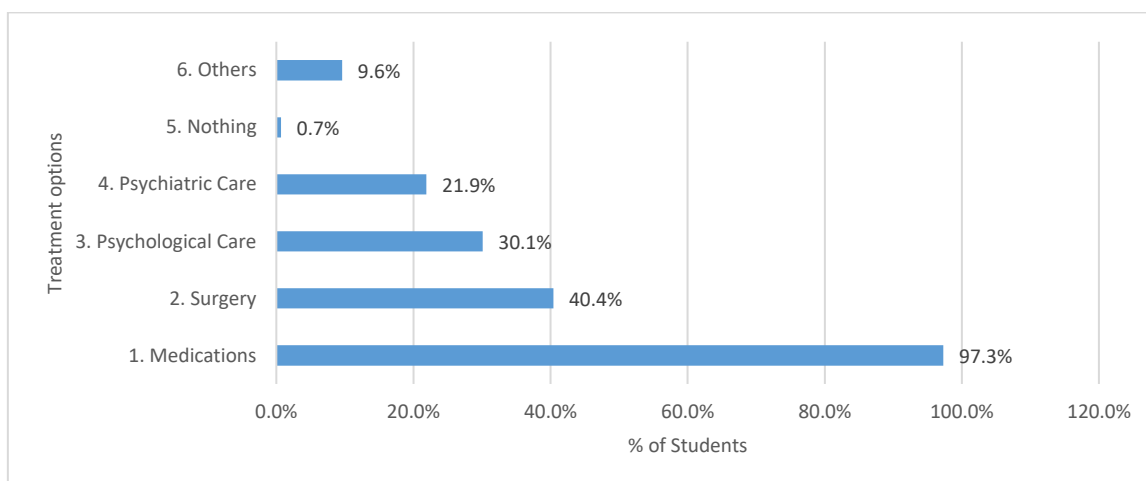


Figure 2: Respondents' knowledge of epilepsy treatment options

The majority of respondents were aware that epilepsy is not a contagious disease (83.5%), while only 7.5% declared that it is contagious, and 9% did not know the correct answer. Almost half of them (54.1%) believed that it is a treatable disease and 69.8% perceived that it can appear at any age. Approximately 88% of respondents believed that epileptic people could marry and have children; however, 38.4% thought that their children had a greater chance of having malformations. Almost 60% of the students responded that people with epilepsy had fewer work opportunities; nevertheless, they can perform physical activities with

some restrictions (82.9%). Further details are presented in Table III.

When compared to their years of study, attitudes towards epilepsy and epileptic patients were better in PHAR students than pre-PHAR students in most of the aspects ($p < 0.05$), as illustrated in Table III. Moreover, almost 65% of the participants declared that their concept of epilepsy had changed after having completed the questionnaire, and 84.2% stated that their awareness was improved and that they knew less about this disease than they had imagined.

Table III: Respondents' perception of epilepsy and epileptic people

Question	Total (n=146)	Year of study		p-value
	Yes, frequency (%)	Pre-PHAR (n=70)	PHAR (n=76)	
Epilepsy is a contagious disease	11 (7.5)	10 (14.28)	1 (1.31)	0.001
Epilepsy is a treatable disease	79 (54.1)	37 (52.8)	42 (55.26)	0.019
Epilepsy can appear at any age	102 (69.8)	42 (60)	60 (78.94)	0.000
Epileptic people can marry	128 (87.7)	56 (80)	72 (94.73)	0.144
Epileptic people can have children	129 (88.3)	57 (81.4)	72 (94.73)	0.183
Children of epileptic people have a high probability of having malformations	56 (38.4)	32 (45.7)	24 (31.5)	0.030
Epileptic people are allowed to drive	26 (17.8)	15 (21.42)	11 (14.4)	0.042
Epileptic people have less opportunities for work	88 (60.3)	44 (62.8)	44 (57.9)	0.124
Epileptic people have poor memory and learning skills	31 (21.2)	18 (25.7)	13 (17.1)	0.008
Epileptic people can perform physical activities but with restrictions	121 (82.9)	49 (70)	72 (94.73)	0.002

Note: pre-PHAR: first and second year students; PHAR: third, fourth, and fifth year students

Discussion

Although previous studies had addressed treatment and remission in patients with epilepsy in Lebanon (Beydoun *et al.*, 2015), as well as the associated stigma and quality of life of Lebanese patients with the disorder (Mroueh *et al.*, 2020), the authors' knowledge, the present study was the first to target knowledge, awareness and attitudes towards epilepsy among a group of health major students. These students, future pharmacists, will be playing a vital role in providing care to patients with epilepsy in the future. As students enrolled in the pharmacy programme represent a better-educated section of the population, therefore they should have the appropriate knowledge and proper approach towards healthcare issues like epilepsy as the disease has substantial social consequences. Previously conducted studies have demonstrated that there exists a robust association between the age and level of education towards epilepsy (Caveness & Gallup Jr., 1980; Gedefa *et al.*, 2012; Vodopić & Vujisić, 2017).

The respondents in this study were mainly females (80.1%); this is because a higher number of females are enrolled in the pharmacy programme at this institution than males. The findings showed that pharmacy students were familiar with epilepsy. On the whole, among those who responded, the majority knew that epilepsy was neurological in origin (93.1%) and that seizures differ in their clinical manifestations (78.7%). These results are quite comparable with the findings of a study conducted by Caixeta and the authors on epilepsy perception amongst university medical students in Brazil (Caixeta *et al.*, 2007). However, the current findings were higher compared to a study conducted by Ab Rahman in a Malaysian university

where only 30% of the respondents knew the cause of epilepsy (Rahman, 2005). This variation in knowledge is maybe because Ab Rahman carried out the study on students from various disciplines and not confined only to pharmacy students who would have better knowledge about epilepsy acquired from their curriculum.

Almost 87% of the respondents considered epilepsy as a brain disease suggesting a better knowledge as compared to a study performed by Thapa and authors among high school students of central Nepal (45.7%) (Thapa *et al.*, 2017), in addition to studies conducted in Cameroon (18.5%) (Njamnshi *et al.*, 2010), and Jordan (50%) (Bahou *et al.*, 2020). Furthermore, almost one quarter (25.1%) thought epilepsy was due to depression which is lower than that found among university students in Yemen (41.6%) (Al-Eryani *et al.*, 2015). This is in line with the authors' expectations as students in health specialities such as pharmacy have usually better knowledge, perhaps because part of their curriculum is to learn about epilepsy and become competent in it before graduating. As for personal contact with epileptic patients, it was observed that a low percentage had a relative, colleague or close friend with epilepsy and only around one-quarter (26%) had previously witnessed an epileptic seizure. Conversely, 55.6% of Malaysian students (Rahman, 2005), 55% of Yemeni university students (Al-Eryani *et al.*, 2015), 53.3% of Saudi Arabian (Obeid *et al.*, 2012), and 49% of Jordanian students (Hijazeen *et al.*, 2014) have seen someone having a seizure at least once during their lifetime.

The results of the current study have shown that the major source of knowledge about epilepsy is lectures taught in the pharmacy programme (63.7%), followed

by books and magazines (33.6%), whereas 91% of pharmacy students in Pakistan reported books and leaflets to be their major source of information (Anjum *et al.*, 2014). It was also noted that a higher level of study affected knowledge of epilepsy ($p < 0.05$). That can be explained by the fact that students are introduced to pharmacotherapeutics courses tackling the neurology/psychiatry modules in the fourth year of the curriculum at Lebanese International University. Also, it is worth mentioning that better knowledge in the last years of study might also be due to involving students in extra-curricular activities, such as conducting awareness campaigns in both on-campus and off-campus settings, to which senior students have a cumulative higher exposure, having spent more years at the school.

As for actions taken during a seizure attack, the results were slightly lower than those obtained among first year medical students at the State University of Campinas, UNICAMP, Brazil, where 81% would protect the head, 43% would place the head sideways, and 24% would hold the tongue of the patient (Caixeta *et al.*, 2007). Similarly, respondents' feelings about an epileptic patient were comparable, as 74% of first medical students have the willingness to help, and 18% would feel fearful when witnessing an individual having seizure (Caixeta *et al.*, 2007).

The most commonly reported treatment option for epilepsy was medications (97.3%) which are higher than the Jordanian and Kuwaiti studies that revealed medications to be the most commonly reported methods among 71.3% and 81% of the respondents, respectively (Al-Rashed *et al.*, 2009; Hijazeen *et al.*, 2014).

In addition, the findings of this study indicated that most of the respondents had favourable attitudes towards patients with epilepsy, where 83.5% thought that epilepsy was not contagious and 88% believed that epileptic people could marry and have children. These results are in line with a study performed on pharmacy students in Pakistan, where the majority (84.2%) were aware that epilepsy is not contagious (Anjum *et al.*, 2014). Similarly, a study conducted in Turkey showed that most of the respondents agreed that epilepsy is not contagious (93.6%); however, 54% consented that epileptic patients should marry (Macit *et al.*, 2018). With regard to involvement in sports, 82.9% of the respondents believed that epileptic patients could perform physical activities, which is similar to the findings of Shahzad Hasan and Khan (85.6%) (Hasan & Khan, 2011), but somewhat lower than that reported in Turkey (Macit *et al.*, 2018), where 90% agreed that patients with epilepsy could participate in sports.

Despite these positive attitudes, more than half of the respondents believed that people with epilepsy had fewer work opportunities and were not allowed to drive. Likewise, an Italian university-based survey indicated that 56% of the students thought that epilepsy limits a person's working capacity (Mecarelli *et al.*, 2007) and 55.8% of Ethiopian students thought that there were jobs that epileptic patients cannot do (Gedefa *et al.*, 2012). Similarly, in Turkey, more than half of the respondents (54.3%) disagreed that epileptics could drive (Macit *et al.*, 2018); however, a study conducted in Kuwait revealed that only a low proportion (15.7%) of respondents agreed that epileptic patients should not drive (Al-Hashemi *et al.*, 2016). Findings also showed that there was a statistically significant relationship between year of study and attitudes towards epilepsy as PHAR students had favourable attitudes in most aspects than pre-PHAR students. These results are not surprising as better knowledge about diseases and their management that is acquired in professional years of the curriculum is usually associated with more positive attitudes and perceptions about the diseases.

The present study has some limitations that should be addressed. First, this was a descriptive cross-sectional study, so it would be difficult to develop a causal relationship. Second, the study was conducted among pharmacy students in only one private university; therefore, the findings cannot be extrapolated to pharmacy students in other private universities, and a large-scale nationwide study is needed to assess other students' perspectives. Third, data could not be collected from students who did not respond to the survey and the authors could not know whether they possessed the same knowledge and attitudes about epilepsy as those who participated in the study.

Conclusion

The findings of the current study showed that pharmacy students were familiar with epilepsy and had an acceptable level of knowledge and positive attitude towards most aspects of epilepsy. Nevertheless, it is recommended to increase the level of undergraduate pharmacy students' knowledge and understanding of epilepsy and to provide them with more information about epilepsy and seizure first aid preparation through formal education in undergraduate courses. Moreover, further research and implementation of epilepsy education programmes are needed.

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Conflict of interest

The authors declare that there is no conflict of interest.

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