



## Investigating the awareness, behavior, and attitude toward epilepsy among university students in Benghazi, Libya

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### ARTICLE INFO

#### Article history:

Received 6 February 2018

Revised 14 March 2018

Accepted 14 March 2018

Available online xxxx

#### Keywords:

Epilepsy  
Stigma  
Knowledge  
Attitude  
Survey

### ABSTRACT

**Objective:** The aim of this study was to explore the level of knowledge regarding epilepsy and attitudes prevalent toward people with epilepsy (PWE) among Libyan university students in comparison with international data.

**Methods:** A self-administrated questionnaire on awareness regarding epilepsy and behaviors toward PWE was distributed among undergraduate students enrolled in the University of Benghazi. The collected data were analyzed against responses from an Italian survey that utilized a similar questionnaire to explore epilepsy-related knowledge and attitudes among Italian university students in Rome (Mecarelli et al., 2007).

**Results:** Out of the 500 interviewed students, 96% successfully completed the survey. Further, 96.6% asserted that they possessed some knowledge regarding epilepsy, gained mainly from their families (76.6%). A total of 57.5% considered epilepsy to be a psychiatric disorder while 11.6% recommended psychological tests for the diagnosis of epilepsy. Moreover, 37.5% believed in ancient superstitions, such as possession by evil forces, as the underlying cause of the condition, and 31.8% recommended traditional remedies to cure it. Further, 66.6% deemed epilepsy as a barrier for career prospects, 41% indicated that it presents an impediment in participation in sports, and 35% considered it as an obstacle in marriage. Additionally, epilepsy was perceived as a severe illness by 53.3% of the respondents and considered to be a moderately severe condition by 43.7%. The responses were found to be statistically significant ( $P < 0.05$ ) against the responses from the Italian study.

**Conclusion:** There is a reasonable level of awareness regarding epilepsy among Libyan students, though a lack of accuracy in the acquired knowledge exists. The ancient misconceptions regarding the nature of epilepsy and negative attitudes toward PWE appear to be rather common among the Libyan students. Consequently, the discrepancies in the views between the two surveys concerning the ways in which epilepsy is perceived and PWE are treated were extremely evident, thus reflecting the already established view that epilepsy faces greater stigma as a health condition in developing countries in comparison with Western nations.

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### 1. Introduction

Epilepsy is a chronic neurological disorder characterized by an enduring predisposition toward the initiation of epileptic seizures that manifest as neurological, cognitive, psychological, and social disturbances [1]. It has been estimated that more than 50 million people across the world have epilepsy [2]. The average global incidence and prevalence rates of epilepsy are 61.4/100,000 and 7.6/1000 inhabitants, respectively [3]. Based on a clinical study conducted by Sridharan et al. in Benghazi, the prevalence rate of epilepsy in Libya was found to be 2.3/1000 inhabitants in 1986 [4].

Epilepsy is considered to be one of the major global chronic disabling conditions that has a significant impact on people with epilepsy (PWE),

their families, as well as the community [5,6]. It has been reported that epilepsy accounts for nearly a quarter of the burden of all neurological diseases, estimated to be greater than the burden exerted by breast cancer in females and prostate cancer in males [7]. This burden is attributed to several factors, including the corresponding physical problems and the psychosocial consequences of the negative attitudes and stigma associated with it [6].

For centuries, across many nations, ancient people did not believe epilepsy to be a neurological disorder but rather possession by evil and fiendish spirits [8,9]. Furthermore, in some communities, particularly in developing countries, epilepsy was perceived as a psychiatric illness that entailed an extreme degree of insanity [10,11]. Importantly, these ancient beliefs and misconceptions are prevalent even today in some societies, particularly among villagers and people residing in rural and remote areas of developing countries [8,9]. Certainly, several studies based in various African countries have consistently reported that epilepsy is commonly perceived by the villagers as a punishment for and curse due to committing sins and evil acts, and PWE should be

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treated as irrational individuals with an extreme level of lunacy [8,9,12]. In contrast, reports from developed nations have revealed more positive attitudes toward PWE, along with less evidence of stigmatization [13].

As a result of the misconceptions and false beliefs regarding the real nature of epilepsy, PWE are maltreated and marginalized more frequently, which have resulted in impairment in their quality of life, along with an increase in comorbidities [14–16]. Certainly, impediments in schooling, education, employment, and marriage were frequently reported by PWE [17–19]. Moreover, there is sufficient evidence to support that there has been an increase in the prevalence of psychiatric disorders including anxiety, social isolation, mood disorders, and depression [20,21], along with an increase in the statistics of poor compliance to prescribed medications [22,23].

Although epilepsy-related knowledge and associated stigma have been widely investigated, including in regional and Arab countries [24–27], statistics regarding the way in which epilepsy is perceived by the Libyan community and the prevalence of the associated stigma are limited. This study, therefore, has been conducted to examine awareness regarding epilepsy and attitudes toward PWE among university students in Benghazi. An additional aim of the study was to assess the degree to which Libyan students' knowledge and attitudes differ from their counterparts in Western countries through an analysis of the collected data against the responses obtained from an earlier study in Italy with university students in Rome [28].

## 2. Methods

### 2.1. Study design

This cross-sectional study was conducted between 2009 and 2010 in Benghazi, Libya, targeting undergraduate students enrolled in the University of Benghazi. A self-administrated questionnaire that addressed knowledge regarding epilepsy and its potential social impact was used for this study (Supplementary file 1). The study was approved by the Postgraduate Education Department and Paediatric Department Faculty of Medicine, University of Benghazi. The concerned questionnaire was adopted from an Italian survey conducted by Mecarelli and his team in 2007 that investigated knowledge and attitudes toward epilepsy among Roman university students [28]. Originally, the questionnaire was utilized in several surveys conducted across the globe for the investigation of the nature of epilepsy and prevalence of associated stigma among people, including university students [29–31]. In order to assess whether Libyan students' perception and attitudes concerning epilepsy are different in relation to the views of their counterparts in developed societies, the responses were compared with the responses of Italian university students, who were involved in a similar survey conducted in 2007 in Rome [28]. In fact, Italy shares some geographical relations with Libya (Mediterranean region) and forms a part of the developed world; in this way, Italian students' perceptions, to some extent, can be considered a reflection of the attitudes and behaviors of Western population.

### 2.2. Participants

Subsequent to its translation into Arabic, the questionnaires were randomly distributed to 500 undergraduate students enrolled in the University of Benghazi. Eligible students who satisfied all the essential inclusion and exclusion criteria (Supplementary file 1) had received the questionnaires at the time of the interview. All the recruited students were Libyan and undergraduate candidates holding a certificate of secondary education completion (high school). Students from the Faculty of Medicine and other related sciences were excluded as their course of study would ensure that they acquired proper knowledge about the condition and thus compromise the result of this study. Verbal consent was obtained from all participants before commencing the investigations.

### 2.3. Statistical analysis and referencing

The responses were subsequently transferred to an Excel sheet and analyzed with the statistical package of the GraphPad Prism7 Statistical Program (<https://www.graphpad.com/scientific-software/prism/>). Libyan students' responses were analyzed against the responses collected from the Italian study [28]. Only the responses from the university students' group from the Italian survey were included in the analysis. Chi-square or Fisher's exact test for small numbers was employed as the tools of analysis for this study. A P value of <0.05 was considered statistically significant. Text referencing and bibliographies were completed with the EndNote X7 Program ([www.endnote.com](http://www.endnote.com)).

## 3. Results

### 3.1. Responses to section 1 of the questionnaire addressing the general knowledge regarding epilepsy (questions 1–3)

Out of the 500 distributed questionnaires, 480 were filled completely by respondents, constituting 96% of the total sample size (Table 1). With regard to the general knowledge section (questions 1–3), 464 (96.6%) of the students who successfully completed the survey asserted that they know something about epilepsy compared with only 16 (3.4%) who denied any previous knowledge. Out of the respondents, 76.6% claimed that their knowledge was gained from families whereas less than a quarter of the participants cited other sources, including mass media, as their source of information (23.4%). Concerning the second question, "Have you ever seen anyone having epileptic fits?", nearly half of the participants reported witnessing epileptic fits, but out of the positive responses, only 26.6% had observed an epileptic seizure in real life while a large majority reported having watched it on TV, cinema, and other sources (73.4%). Further, in response to the question pertaining to the prevalence of epilepsy, 78.7% reported that they did not know the answer whereas only 1.6% of the total participants selected the correct response (1 to 2 per 1000).

### 3.2. Responses to section 2 of the questionnaire addressing specific knowledge regarding epilepsy (questions 4–8)

For questions 4–6, students were provided the choice to mark more than one answer for each individual question if they agreed with the statement (Table 1). With regard to epilepsy being a disease, more than half of the respondents believed that epilepsy is a psychiatric disorder (57.5%), exceeding the group who considered epilepsy as a neurological disease (45.8%). Almost one-third of the participants, in addition, described epilepsy as a hereditary disorder that ran in families (35%), and only a negligible proportion considered it as a contagious disease (1.6%). With regard to the etiologies of epilepsy (question 5), birth defects formed the predominant reported underlying cause, scoring 41.6% followed by the other causes, including ancient beliefs, such as possession by evil spirits, that comprised 37.5% of the total responses. Genetic factors as a cause for epilepsy were reported by one-third of the sample (33.3%), and almost a quarter (25%) reported infective brain diseases as a cause while 15% of the participants claimed that they were not aware of the etiology. Further, in response to diagnostic techniques (question 6), 31.6% of the respondents recommended electroencephalogram (EEG), and 30% indicated computed tomography (CT) or magnetic resonance imaging (MRI) whereas 36.6% of the students could not answer this question. Psychological test and brain X-ray, however, were each indicated by 11.6% of the respondents while only 1.6% reported blood tests.

Additionally, in responses to question 7 that elicits information regarding therapy for epilepsy, nearly one-third of the respondents unexpectedly stated that they believe in religious therapy and other proposed ancient remedies (31.8%). On the other hand, a quarter of the participants (25.6%) thought there were specific medications that

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