General Awareness about Epilepsy in a Cohort of Female and Male Students: A Statistical Comparison

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Abstract

Background and Objective   A survey on general awareness toward epilepsy was conducted on a cohort of female and male medical and paramedical students that represent a model educated section of the society. It is, therefore, imperative that this section of the society acquires correct knowledge about epilepsy.

Materials and Methods   The subjects were undergraduate students from medical and paramedical institutes in Gwalior region who were gathered to celebrate the National Epilepsy Day on November 17, 2016. A self-administered questionnaire of 50 questions on general awareness about epilepsy was completed at the very beginning before the celebrations. The results were subjected to various statistical analyses.

Results   A total of 251 respondents (149 females and 102 males) in the age group of 17 to 31 years participated in the survey. All the respondents had heard about epilepsy. One-hundred fifty-eight participants were from medical and dental institutes, whereas 93 participants were from paramedical institutes. In general, the female participants exhibited significantly greater general knowledge about epilepsy in comparison to the male respondents.

Keywords
► patients with epilepsy
► misconceptions
► medical students
► paramedical students
► National Epilepsy Day

Conclusion   The results indicate a favorable degree of awareness about epilepsy. A definite knowledge gap was observed between the medical and paramedical students. However, the awareness still needs to be enhanced even among students pursuing medical and paramedical courses through various programs apart from their academic curriculum, as a certain degree of misconceptions and superstitious beliefs associated with epilepsy continues to prevail even in this educated section of the society.

Introduction

Epilepsy is not only one of the oldest but also one of the commonest known neurological diseases of mankind. Despite possessing a long history of existence, an operational definition has been framed only recently in 2014 by the International League Against Epilepsy.[1] Earlier, epilepsy diagnosis was based on at least two unprovoked seizures, but recent operational definition allows diagnosis of epilepsy even after the first unprovoked seizure associated with the recurrence risk of 60% or more, thus allowing early diagnosis and improved prognosis, as the prognosis of epilepsy and even risk of intractability or medical refractoriness are dependent on the gap between the index seizure and initiation of appropriate antiepileptic therapy.

The prevalence of epilepsy is also high (~1% of the general population) with an estimate of 65 million patients with epilepsy (PWE) worldwide.[2] Epilepsy is more common in under developed and developing countries in comparison to developed ones. In India also, epilepsy is more common in rural areas (1.6–1.9%) in comparison to urban areas (0.6%).[3,4]

The lack of awareness about epilepsy and its possible consequences is a major factor for delayed seeking of medical assistance resulting not only in a large treatment gap (~50–70%),[3] but also adversely affecting the quality of life. In India, PWE, on one hand, are commonly subjected to discrimination in education and job procurement, while, on the other hand, they encounter social stigma including marital disharmony.[5]

Despite being commonly existent for thousands of years, epilepsy still remains shrouded in mystery in the public at large; it is still associated with myths, misconceptions, and misunderstandings even in the educated sections of urban populations of India. This study was undertaken to assess general awareness about the disease in a cohort of female and male medical and paramedical undergraduate students that can be considered to represent an educated section of the society.

The study was conducted on the National Epilepsy Day (November 17, 2016) and based solely on the responses obtained on a questionnaire. The respondents were undergraduate students from medical, dental, and paramedical institutes in Gwalior region who had gathered to celebrate the National Epilepsy Day in Maharana Pratap College of Dentistry and Research Centre, Gwalior.

Materials and Methods

A total of 251 subjects were enrolled in the study. The subjects were classified according to gender, age, and institute (medical and paramedical). Thus, there were 149 females and 102 males and the two age groups were 17 to 20 and 21 to 31 years; the mean age of females was 20.86 years and that of males 20.53 years. The students from medical and dental institutes were clubbed into medical institute category.

One-hundred fifty-eight participants were from medical institute category out of which 108 were females and 50 were males. Ninety-three participants were from paramedical institutes, out of which 41 were females and 52 were males. One-hundred twenty-four participants belonged to 17 to 20 age group (64 females, 60 males), while 118 participants belonged to 21 to 31 years of age group (79 females, 39 males). The age of nine participants remained unrecorded.

The participants' responses on general awareness about epilepsy were recorded and assessed by administering a questionnaire on epilepsy awareness. The questionnaire consisted of 50 questions that were classified into four categories, namely misconceptions, superstitions, myths, and general knowledge about epilepsy. A score of 1 was given to the correct response and 0 was given to the incorrect one for each question. ►Table 1 shows the descriptive statistics of responses on each of the four categories of epilepsy awareness by females and males irrespective of the institute and age.

The data so obtained on all the four categories on epilepsy awareness were analyzed by using different types of statistics. To start with, the data were first tested for normality, the results of which are shown in ►Table 2. Later, the data were analyzed in three stages.

In the first stage, the responses of females and males were compared with each of the four categories of epilepsy awareness irrespective of their institute and age by applying the "*t*" test using Statistical Package for the Social Science software. The results are shown in ► Tables 1 and 3.

Second, the responses of females and males on each of the four categories of epilepsy were compared among the medical students as well as in paramedical students separately irrespective of their age. This result is shown in ►Tables 4 to 7.

Lastly, the responses of females and males on each of the four categories of epilepsy were compared with each of the two age categories, that is, 17 to 20 and 21 to 31 separately irrespective of their institute. Results of this analysis are shown in ►Tables 8 to 11.

Results

It can be seen from the ►Table 2 that the Shapiro statistic is significant for misconception, superstition, and myth; hence, the distribution of these three variables is not normal. On the

Table 1 Descriptive statistics of responses on each of the four categories of epilepsy awareness in females and males irrespective of institute and age

Categories	Gender	*N*	Mean	SD
Misconception	Female	149	7.09	2.197
	Male	102	6.25	2.386
Superstition	Female	149	0.69	0.464
	Male	102	0.52	0.502
Myth	Female	149	1.32	0.791
	Male	102	1.17	0.785
General knowledge	Female	149	19.39	5.163
	Male	102	16.46	5.745

Abbreviations: *N*, number; SD, standard deviation.

Table 2 Testing normality of each of the four categories of epilepsy awareness

	Kolmogorov–Smirnov			Shapiro–Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Misconception	0.117	251	0.000	0.977	251	0.000
Superstition	0.403	251	0.000	0.615	251	0.000
Myth	0.300	251	0.000	0.766	251	0.000
General knowledge	0.068	251	0.007	0.991	251	0.128

Abbreviations: df, degree of freedom; Sig., significance.

Table 3 Results of "t" test of the data on epilepsy awareness categories when comparing the responses of females and males irrespective of institute and age

		Levene's test		t-test			
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference
Misconception	Equal variances assumed	0.409	0.523	2.903	249	0.004	0.849
	Equal variances not assumed			2.858	205.161	0.005	0.849
Superstition	Equal variances assumed	16.842	0.000	2.786	249	0.006	0.172
	Equal variances not assumed			2.744	205.500	0.007	0.172
Myth	Equal variances assumed	0.704	0.402	1.535	249	0.126	0.155
	Equal variances not assumed			1.537	218.278	0.126	0.155
General knowledge	Equal variances assumed	0.724	0.396	4.215	249	0.000	2.928
	Equal variances not assumed			4.131	201.527	0.000	2.928

Abbreviations: df, degree of freedom; Sig., significance.

Table 4 Descriptive statistics of responses on each of the four categories of epilepsy awareness in females and males of medical institutes irrespective of age

	Gender	N	Mean	SD
Misconception	Female	108	7.40	2.174
	Male	50	6.70	2.573
Superstition	Female	108	0.84	0.366
	Male	50	0.62	0.490
Myth	Female	108	1.50	0.730
	Male	50	1.30	0.789
General knowledge	Female	108	20.55	5.133
	Male	50	18.32	6.156

Abbreviations: N, number; SD, standard deviation.

other hand, the Shapiro statistic is not significant for general knowledge; hence, this variable is normally distributed. Violation of normality indicates that the prevalence of responses on the variable is not a normal phenomenon. Thus, some specific trends are indicative in case of the subjects' responses on the three variables, namely misconception, superstition, and myth. This will be verified further with the results in the following sections.

To apply "t" test, its associated assumption of homogeneity of variances was checked by using Levene's test as shown in the tables below.

Tables 3, 5, 7, 9, and 11 show the results of "t" tests for comparing the responses of the participants with each of the four parameters of epilepsy awareness; the participants are classified into five subcategories that are as follows:

1. Female and male participants irrespective of their institute and age (►**Table 3**).
2. Female and male participants of medical institutes irrespective of their age (►**Table 5**).
3. Female and male participants of paramedical institutes irrespective of their age (►**Table 7**).
4. Female and male participants of the age group 17 to 20 years (►**Table 9**).
5. Female and male participants of the age group 21 to 31 years (►**Table 11**).

Table 5 Results of "*t*" test of the data on epilepsy awareness categories when comparing the responses of females and males of medical institutes irrespective of age

		Levene's test		t-test			
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference
Misconception	Equal variances assumed	2.214	0.139	1.769	156	0.079	0.698
	Equal variances not assumed			1.663	82.611	0.100	0.698
Superstition	Equal variances assumed	30.543	0.000	3.181	156	0.002	0.223
	Equal variances not assumed			2.862	75.231	0.005	0.223
Myth	Equal variances assumed	1.053	0.307	1.561	156	0.121	0.200
	Equal variances not assumed			1.517	89.115	0.133	0.200
General knowledge	Equal variances assumed	2.015	0.158	2.377	156	0.019	2.226
	Equal variances not assumed			2.224	81.738	0.029	2.226

Abbreviations: df, degree of freedom; Sig., significance.

Table 6 Descriptive statistics of responses on each of the four categories of epilepsy awareness in females and males of paramedical institutes irrespective of age

	Gender	N	Mean	SD
Misconception	Female	41	6.29	2.077
	Male	52	5.81	2.124
Superstition	Female	41	0.29	0.461
	Male	52	0.42	0.499
Myth	Female	41	0.85	0.760
	Male	52	1.04	0.766
General knowledge	Female	41	16.34	3.877
	Male	52	14.67	4.723

Abbreviations: N, number; SD, standard deviation.

Table 7 Results of "*t*" test of the data on epilepsy awareness categories when comparing the responses of females and males of paramedical institutes irrespective of age

		Levene's test		t-test			
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference
Misconception	Equal variances assumed	0.018	0.894	1.104	91	0.272	0.485
	Equal variances not assumed			1.107	86.855	0.271	0.485
Superstition	Equal variances assumed	6.514	0.012	−1.294	91	0.199	−0.130
	Equal variances not assumed			−1.306	88.696	0.195	−0.130
Myth	Equal variances assumed	0.120	0.730	−1.159	91	0.250	−0.185
	Equal variances not assumed			−1.160	86.294	0.249	−0.185
General knowledge	Equal variances assumed	0.917	0.341	1.828	91	0.071	1.668
	Equal variances not assumed			1.871	90.833	0.065	1.668

Abbreviations: df, degree of freedom; Sig., significance.

Now, referring to Tables 1, 4, 6, 8, and 10, it can be inferred that:

1. In general, the responses of females on misconception, superstition, and general knowledge about epilepsy are higher than that of the males, meaning that females possess more knowledge about epilepsy than males, but at the same time also exhibit more misconceptions and are more superstitious than males.

2. The responses of females on superstition and general knowledge about epilepsy are higher than that of the males, meaning that females of medical institutes possess more knowledge about epilepsy than males of medical institutes, but at the same time also are more superstitious than males.

3. In paramedical students, the "*t*" test is insignificant in all the categories: misconception, superstition, myth, and

Table 8 Descriptive statistics of responses on each of the four categories of epilepsy awareness in females and males in the 17 to 20 years age group irrespective of institute

	Gender	N	Mean	SD
Misconception	Female	64	6.64	2.192
	Male	60	6.18	2.221
Superstition	Female	64	0.64	0.484
	Male	60	0.50	0.504
Myth	Female	64	1.11	0.799
	Male	60	1.13	0.791
General knowledge	Female	64	18.25	4.639
	Male	60	15.85	4.843

Abbreviations: N, number; SD, standard deviation.

Table 9 Results of "t" test of the data on epilepsy awareness categories when comparing the responses of females and males in the 17 to 20 years age group irrespective of institute

		Levene's test		t-test			
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference
Misconception	Equal variances assumed	0.101	0.751	1.154	122	0.251	0.457
	Equal variances not assumed			1.153	121.261	0.251	0.457
Superstition	Equal variances assumed	5.071	0.026	1.585	122	0.116	0.141
	Equal variances not assumed			1.583	120.626	0.116	0.141
Myth	Equal variances assumed	0.002	0.963	−0.168	122	0.867	−0.024
	Equal variances not assumed			−0.168	121.631	0.867	−0.024
General knowledge	Equal variances assumed	0.361	0.549	2.818	122	0.006	2.400
	Equal variances not assumed			2.814	120.597	0.006	2.400

Abbreviations: df, degree of freedom; Sig., significance.

Table 10 Descriptive statistics of responses on each of the four categories of epilepsy awareness in females and males in the 21 to 31 years age group irrespective of institute

	Gender	N	Mean	SD
Misconception	Female	79	7.35	2.184
	Male	39	6.51	2.614
Superstition	Female	79	0.72	0.451
	Male	39	0.56	0.502
Myth	Female	79	1.48	0.766
	Male	39	1.28	0.759
General knowledge	Female	79	20.43	5.530
	Male	39	17.72	6.894

Abbreviations: N, number; SD, standard deviation.

general knowledge; hence, it cannot be inferred that there is a significant difference between the responses of females and males of paramedical institutes in these four categories.

4. The responses of females on general knowledge about epilepsy are higher than that of the males, meaning that females in the 17 to 20 years age group possess more knowledge about epilepsy than males of the same age group.

5. The responses of females on general knowledge about epilepsy are higher than that of the males, meaning that females in the 21 to 31 years age group possess more knowledge about epilepsy than males of the same age group.

Discussion

In general, females performed better than males. Statistically, 47/149 (31.54%) females scored more than 60% and 9/149 (6.04%) scored more than 80% correct answers in comparison to 22/102 (21.56%) males who scored more than 60%

Table 11 Results of "t" test of the data on epilepsy awareness categories when comparing the responses of females and males in the 21 to 31 years age group irrespective of institute

		Levene's test		t-test			
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference
Misconception	Equal variances assumed	1.514	0.221	1.843	116	0.068	0.842
	Equal variances not assumed			1.734	64.939	0.088	0.842
Superstition	Equal variances assumed	7.482	0.007	1.717	116	0.089	0.157
	Equal variances not assumed			1.655	68.954	0.102	0.157
Myth	Equal variances assumed	0.011	0.917	1.332	116	0.186	0.199
	Equal variances not assumed			1.335	76.366	0.186	0.199
General knowledge	Equal variances assumed	1.441	0.232	2.306	116	0.023	2.712
	Equal variances not assumed			2.141	62.887	0.036	2.712

Abbreviations: df, degree of freedom; Sig., significance.

and 2/102 (1.96%) only who scored more than 80% correct answers. Overall, the general knowledge about epilepsy and the gender difference were more pronounced in the medical category as compared with the paramedical category, a feature that may be expected. Statistically, 72/158 (45.57%) participants from medical institutes scored more than 60% and 11/158 (6.96%) scored more than 80% correct answers in comparison to 8/93 (8.6%) participants from paramedical institutes who scored more than 60% and none of the paramedical students scored more than 80% correct answers.

Thus, it is quite evident that female students, in general, exhibited significantly greater knowledge about epilepsy than male students. However, misconceptions and superstitions about epilepsy also tend to prevail more among females in comparison to males. In the authors' opinion, the explanation of this apparent paradox or discrepancy is hypothesized as follows. Social interaction of females is more; hence, they encounter and/or hear about epilepsy more, leading to more discussions about the ailment. Furthermore, female students view and pursue their professional studies more sincerely and seriously. Increased prevalence of misconceptions and superstitions in females may be due to their upbringing, acquisition of knowledge significantly from traditional hearsay and restricted accessibility to sources of correct knowledge such as internet, teachers, and modern mass media sources for clarification of doubts. It is admitted that larger studies, designed to study and analyze this discrepancy and hypothetical explanation, are strongly required.

Misunderstandings and misconceptions related to epileptic disorders in the general public contribute to social discrimination and stigmatization along with negative and psychopathological feelings in the sufferers. Medical and paramedical professionals are primary and first-hand educators to educate the public at large; hence, it is imperative that they are fully aware about the epileptic disorders and consequences of misunderstandings and misconceptions in the society.

Conclusion

To the best of our knowledge, this gender-based statistical survey of epilepsy awareness among medical and paramedical students is the first study of its kind, and although the survey reveals a favorable degree of awareness about epilepsy, misconceptions and superstitions still prevail in the students' minds that need to be attended to despite a definite knowledge gap between the medical and paramedical students.

In view of the observations, it is strongly recommended that epilepsy awareness camps, symposia, workshops, and quiz competitions be held periodically and regularly; education through contemporary technology and student-friendly multimedia may be resorted to for strengthening and enhancing the mode and impact of awareness in this section of the society.

Conflict of Interest
None.

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