

Understanding of and attitudes toward epilepsy among the urban Chinese population in Malaysia

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ABSTRACT

Introduction: People with epilepsy are socially discriminated against on the grounds of widespread negative public attitudes, misunderstandings and defensive behaviour. The primary purpose of this study was to evaluate the public understanding of and attitudes toward epilepsy among the Chinese population in Malaysia.

Methods: A validated, self-administered questionnaire comprising 23 questions was utilised to evaluate the understanding of and attitudes toward epilepsy among randomly approached respondents from the Chinese population living in the urban areas of Penang, Klang Valley, Kuala Lumpur and Sibul in Malaysia.

Results: Out of 1,000 people approached, 697 (69.7 percent) respondents agreed to participate in the study. When asked whether people with epilepsy are slow learners and have intellectual functioning below normal, 448 (64.3 percent) respondents answered 'no'. This positive answer was mainly provided by female (35.6 percent) as compared to male (28.6 percent) respondents. Moreover, more than half responded positively to the following statements: people with epilepsy should not be isolated from the normal population; epileptics can perform daily activities; epileptics can receive academic education; and epileptics can become useful members of society. In addition, significant associations were discovered between the education level of the respondents and several statements, including whether epileptics are as intelligent as everyone else (p -value is 0.009), whether epilepsy can be treated with drugs (p -value is 0.037) and whether epileptics can be as successful as other people in their chosen career (p -value is 0.009). Positive responses were mainly acquired from those with secondary education and above. A large number of the respondents felt that

people with epilepsy should not be employed as lorry drivers, firefighters, doctors and army personnel.

Conclusion: The general Chinese population in the urban areas of Malaysia had, at the time of the investigation, a relatively high level of understanding and positive attitudes toward certain aspects of epilepsy, although a minority of the study population demonstrated prejudice and discriminatory behaviours toward people with epilepsy.

Keywords: attitudes, Chinese, epilepsy, understanding, urban areas

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INTRODUCTION

People with epilepsy are still socially discriminated against on the grounds of widespread negative public attitudes, misunderstandings and defensive behaviour.^(1,2) Recent research has shown that stigma against epileptic patients contributes to increased rates of psychopathology and reduced social interactions.⁽³⁻⁶⁾ Although seizures can vary among patients, they tend to be stereotyped within an individual.^(3,7,8) How, then, does the clinical presentation of epilepsy fit into the bigger picture – the link that has been established between public understanding, attitudes and social stigma? Potential explanations have been hypothesised and proven, to some extent, about the fear that seizures can evoke in people without epilepsy.^(9,10) In losing control, people with seizures are seen as “reverting to the primitive”, and hence, induce terror and fear in those without seizures.^(10,11) By representing human weakness and unpredictability, people with epilepsy appear to be an insult to societal values and may even be deemed dangerous,⁽¹²⁾ or they may arouse a sense of impotence in others.⁽¹⁰⁾

The most common false beliefs are related to mental retardation, mental illness and emotional disturbances in patients.^(1,13,14) In extreme cases, epilepsy could be perceived as possession by an evil spirit.⁽¹⁵⁾ Patients

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may exhaust their limited resources in non-evidence-based alternative therapies.⁽¹⁶⁾ The historical ascription of seizures to insanity, witchcraft or supernatural forces remains a basis for contemporary stigma and discrimination.⁽¹⁷⁾ Stigma generates a vicious cycle, whereby a lack of general knowledge about epilepsy hinders social acceptance, which in turn drives the patient to hide the disease, making it difficult to increase public awareness of the condition.⁽¹⁸⁾

Various studies have assessed the knowledge and attitudes of communities regarding epilepsy from the perspective of the general public. One such study was conducted in the United Kingdom, where half of the respondents agreed that people with epilepsy are treated differently by others in manners of exclusion, restriction and non-normality.⁽³⁾ In another study carried out to ascertain the prevalence, knowledge, attitudes and practices of epilepsy in India through a three-phased survey, 40% of the respondents felt that individuals with epilepsy could not be properly educated or employed.⁽¹⁹⁾ A review of the knowledge and attitudes toward people with epilepsy concluded that New Zealanders were well informed about epilepsy and that their attitudes were mainly positive.⁽¹⁷⁾ On the other hand, one study concluded that the Greek public was familiar with epilepsy but had a suboptimal level of appropriate understanding of the essential aspects of the disease.⁽²⁰⁾

Before a health education program can be established, the beliefs and behaviours of the target population with respect to the disease in question must first be identified. A survey of public understanding of and attitudes toward the condition would provide a guideline for correcting this misunderstanding. In addition, research on public understanding of and attitudes toward epilepsy that is representative of the different parts of Malaysia and among its races is lacking. An assessment of the level of understanding and attitudes among the general community would help press the point and identify the foci for increasing awareness and eradicating misinformation about epilepsy in a more targeted and effective manner. This is crucial in helping to advance the development of a healthy social system and in creating a better prospect for epileptic patients in a setting where prejudice or discrimination toward them arises unconditionally.

METHODS

A validated, self-administered questionnaire consisting of 23 questions was utilised. The development of the questions involved a detailed review of questions used in previous international studies, with the intention of replicating them, wherever possible, to aid in the

Table 1. Demographic characteristics of the respondents (n = 697).

Demographic	No. (%)
Gender ^a	
Male	200 (28.7)
Female	372 (53.4)
Mean age \pm standard deviation	32.4 \pm 12.6
Age group ^b	
18–34	446 (64.0)
35–49	123 (17.6)
50–64	99 (14.2)
> 65	10 (1.4)
Marital status ^c	
Married	282 (40.5)
Unmarried	414 (59.4)
Children of the respondents ^d	
Yes	239 (34.3)
No	456 (65.4)
Educational level ^e	
None	10 (1.4)
Primary	28 (4.0)
Secondary	130 (18.6)
Graduate	384 (55.1)
Postgraduate	45 (6.4)
Employment status ^f	
Unemployed	26 (3.7)
Labourer	100 (14.3)
Professional	246 (35.3)
Student	239 (34.3)
Housewife	56 (8.0)
Retired	27 (3.9)

^a No response from 125 participants; ^b No response from 19 participants; ^c No response from 1 participants; ^d No response from 2 participants; ^e No response from 100 participants; ^f No response from 3 participants

comparison of the results.^(1,3,15-20) The questionnaire was divided into three parts. The first part was developed to obtain the demographic characteristics of the population. The questions in the other two parts were developed to gather information on public understanding of and attitudes toward epilepsy.

The questionnaire was pre-tested on 40 randomly selected individuals from the target population. The questionnaire was distributed to each participant on two separate occasions, 15 days apart. This time lapse between the two occasions was deemed to be long enough to avoid simple recall of the previous answers, but short enough to avoid a consistent change in activity over time. It was hypothesised that there was no agreement between the respondents on the two separate occasions. The kappa test was used to assess the level of agreement between two respondents. The calculated value of the kappa test was $K = 0.482$ and the exact p-value was found to be significant ($p = 0.048$), which led to a rejection of the null hypothesis that there was no agreement between the two respondents on the two separate occasions. The internal consistency (reliability) of the questionnaire was also assessed using the Cronbach's alpha test. The reliability

Table II. The respondents' understanding of epilepsy (n = 697).

Question	No. (%)		
	Yes	No	Don't know
1. Do you think epileptics are slow learners?	141 (20.2)	448 (64.3)	108 (15.5)
2. Do you think epilepsy is a type of mental illness?	100 (14.3)	524 (75.2)	73 (10.5)
3. Do you think epilepsy is a hindrance to a happy life?	301 (43.2)	304 (43.6)	92 (13.2)
4. Do you think epileptics can lead a married life? ^a	503 (72.2)	85 (12.1)	108 (15.5)
5. Do you think epileptics can lead a normal sexual life? ^b	447 (64.1)	72 (10.3)	176 (25.2)
6. Do you think society discriminates against epileptics?	287 (41.2)	294 (42.2)	116 (16.6)
7. Do you think epileptics should be isolated from the normal population? ^c	36 (5.2)	438 (62.8)	22 (3.2)
8. Do you think epileptics can perform daily activities?	594 (85.2)	64 (9.2)	39 (5.6)
9. Do you think epileptics can receive academic education?	644 (92.4)	27 (3.9)	26 (3.7)
10. Do you think epileptics should participate in sports?	393 (56.4)	195 (27.9)	109 (15.6)
11. Do you think epileptics can become useful members of society?	626 (89.8)	34 (4.9)	37 (5.3)

^a No response from 1 participant; ^b No response from 2 participants; ^c No response from 201 participants

Table III. The respondents' attitudes toward epilepsy (n = 697).

	No. (%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Epileptics are as intelligent as everyone else.	24 (3.4)	55 (9.0)	202 (29.0)	306 (43.9)	110 (15.8)
b. Epileptics have more personality problems than other people. ^a	41 (5.9)	218 (31.3)	207 (29.7)	208 (29.8)	21 (3.1)
c. It is frightening for others to see someone having a seizure. ^b	23 (3.3)	92 (13.2)	185 (26.5)	323 (46.3)	73 (10.5)
d. Doctors can successfully treat epilepsy with drugs in most cases. ^b	12 (1.7)	78 (11.2)	240 (34.4)	324 (46.5)	42 (6.0)
e. Epileptics can be as successful as other people in their chosen career. ^b	12 (1.7)	44 (6.3)	138 (19.8)	375 (53.8)	127 (18.2)

^a No response from 2 participants; ^b No response from 1 participant

coefficient was calculated as $\alpha = 0.71$. Hence, it can be concluded that the questionnaire produced results that were internally consistent.

In addition, the questionnaire was translated into the Chinese language (Chinese version) for those who could not read or understand English. The Chinese version of the questionnaire was also pre-tested on 20 individuals from the expected population. The same procedures and methods for checking the validity and reliability of the questionnaire were applied. The densely Chinese-populated urban areas of Penang, Sibul, Klang valley and Kuala Lumpur were selected for the study. Adults ≥ 18 years of age, who were willing to participate in the survey and residing in urban areas, were randomly approached to complete the survey. Convenience sampling was used to enroll all the eligible respondents during the study period.

An information sheet explaining the purpose of the study was shown to the respondents before consent to complete the questionnaire was acquired. The respondents then proceeded to fill out the questionnaire under the supervision of a researcher. The researchers were instructed not to lead or coax the respondents in their answers but to elucidate the questions when it was

necessary to clarify the points. All information gathered was kept confidential.

Both descriptive and inferential statistics were used for data analysis. Statistical analysis was performed using the Statistical Package for the Social Sciences version 13.0 (SPSS Inc, Chicago, IL, USA). The variables were taken to be significant at a p-value ≤ 0.05 . The chi-square test was utilised to determine the association between the independent variables (sociodemographic characteristics) and dependent variables (responses to questions). In order to unveil the relationship between these variables, the Kendall's tau and Spearman's tests were used.

RESULTS

Out of 1,000 people who were requested to participate in the study, 697 accepted and successfully completed the questionnaire. More than half of the respondents were female (53.4%). The mean age and standard deviation of the respondents was 32.4 ± 12.6 years. The majority of the respondents (64%) fell into the age group between 18 and 34 years. A total of 282 (40.5%) respondents were married, out of which 84.8% had children. The demographics of the study population are listed in

Table IV. Responses to questions regarding personal stance on epilepsy (n = 697).

Question	No. (%)
12. If you had epilepsy, how easily would you talk about it with other people?	
I would keep it as a secret from everybody.	95 (13.6)
I would talk about it only to people very close to me.	386 (55.4)
I would talk about it freely with anyone.	151 (21.7)
I don't know or wish to answer.	65 (9.3)
13. How you would react if you learnt that someone you know has epilepsy?	
I would treat him as before.	581 (83.4)
I would feel a little awkward and afraid, and I would rather avoid him.	75 (10.8)
I would feel very awkward and afraid, and I would stop contacting him.	14 (2.0)
I don't know or wish to answer.	27 (3.9)
14. Would you like to associate with an epileptic in social situations?	
I would easily do it.	465 (66.7)
I would be a little hesitant about it.	199 (28.5)
I would be very hesitant about it.	18 (2.6)
I would avoid it.	15 (2.1)
15. Could you become a close friend with an epileptic?	
I would easily do it.	425 (61.0)
I would be a little hesitant about it.	241 (34.6)
I would be very hesitant about it.	22 (3.2)
I wouldn't do it.	9 (1.3)
16. Would you agree to marry (yourself or your children) an epileptic, if this person is otherwise acceptable? ^a	
I would easily do it.	103 (14.8)
I would be a little hesitant about it.	337 (48.3)
I would be very hesitant about it.	103 (14.8)
I would avoid it.	151 (21.7)
17. Assuming you had a business of your own, would you hire an epileptic in your own business, if he/she has the skills or qualifications for it?	
I would hire him.	279 (40.0)
I would hire him under certain circumstances.	343 (49.2)
I would be very hesitant to hire him.	40 (5.7)
I wouldn't hire him.	35 (5.0)
18. Would you agree to your children playing with or befriending a child with epilepsy? ^b	
I would easily agree with it.	420 (67.4)
I would be a little hesitant about it.	184 (26.4)
I would be very hesitant about it.	17 (2.4)
I would avoid it.	25 (3.6)

^a No response from 3 participants; ^b No response from 51 participants

Table I. Most of the respondents were graduates (55%), followed by respondents with secondary education (18.7%). Approximately 35% of the respondents were professionals, 14.3% were labourers and 34.3% were students.

Table II lists the responses to the fundamental questions on the understanding of epilepsy. When asked whether people with epilepsy are slow learners and have intellectual functions below normal, 448 (64.3%) respondents answered 'no'. This positive answer was mainly provided by female (35.6%) as compared to male (28.6%) respondents. The majority of the respondents (85.2%) believed that epileptics can perform daily activities, while 62.8% and 43.2% of the respondents believed that epileptics should not be isolated from the general population and that epilepsy is a hindrance

to a happy life, respectively (Table II). Nearly 44% of the respondents felt that people with epilepsy are as intelligent as the general population. Nevertheless, 46.3% of respondents expressed that it is frightening for others to see someone having a seizure. Approximately 47% of the respondents agreed that epilepsy can be treated with drugs. A large proportion of the respondents (53.8%) concurred that persons with epilepsy can be as successful as others in their chosen career (Table III).

When asked how easily the respondents would talk about this condition with other people if they themselves had epilepsy, more than half (55.4%) would only talk to people who are very close to them, whereas 21.7% of the respondents would talk about it freely with others. When the respondents were asked for their reaction if they learnt that someone they know has epilepsy, 83.4%

Table V. Responses to questions on employment for epileptics and the causes of epilepsy.

Question	No. (%)
20. What jobs do you think epileptics should not be employed in?	
Teacher	139 (4.9)
Nurse	302 (10.8)
Doctor	371 (13.2)
Pharmacist	127 (4.5)
Police officer	315 (11.2)
Lorry driver	426 (15.2)
Firefighter	410 (14.6)
Factory worker	148 (5.2)
Sports player	201 (7.2)
Armed forces personnel	340 (12.1)
None of the above	25 (0.9)
23. Which of the items listed on this card do you think are the main causes of epilepsy?	
Accident (e.g. head injury)	171 (9.8)
Brain disorder	248 (14.2)
Problem with nervous system	383 (22.0)
Mental illness	93 (5.3)
Stress/pressure	153 (8.8)
Born with it/birth injury	387 (22.2)
Result of another illness or disease	157 (9.0)
Old age	31 (1.8)
Alcohol or drug abuse	84 (4.8)
An infection caught from other people	16 (0.9)
None of the above	19 (1.1)

NB: Respondents were able to select more than one option.

responded that they would treat the epileptic as they had before. Approximately 61% of the respondents stated that they could easily become close friends with an epileptic, while 34.6% said they would be a little hesitant about it (Table IV).

When the respondents were asked to choose a preferred disease, or if a person close to them were to have a disease, only a small number of respondents (11.4%) selected epilepsy, whereas asthma was the most preferred disease selected (35.5%). A large number of respondents felt that people with epilepsy should not be employed as lorry drivers (15.2%), firefighters (14.6%), doctors (13.2%) and armed forces personnel (12.1%) (Table V). The respondents were also given a list of health conditions associated with a new colleague in their workplace and asked to rank them from those that would cause them the most to the least concern. Epilepsy was ranked as the fifth (10%) most concerning condition (Table VI).

Finally, question 23 asked explicitly about the probable cause(s) of epilepsy. The results are presented in Table V. 22.2% of respondents identified epilepsy as a birth injury or believed that epileptics are born with it (congenital), whereas 22% identified the causes of epilepsy as being a problem with the nervous system and 14.2% regarded epilepsy as the result of a brain disorder. Demographic factors, such as gender, age, marital status, education level and employment status, were

significantly associated with some of the questions on the understanding of and attitudes toward epilepsy.

DISCUSSION

The main aims and objectives of this study were to evaluate the degree of understanding of and the stated attitudes toward epilepsy. We constructed and designed a validated and reliable questionnaire for this study, one that can be used for similar types of studies on different ethnic groups in Malaysia, as there have been only a few studies conducted prior to this.^(16,21) This study reflects the sequence of comparable studies that have been conducted in various parts of the world.^(1,3,15-20) All these studies have generally used similar methods and questionnaires, and therefore, share some common methodological obstacles such as a variation in the number of respondents.

During the course of data collection, the respondents were prompted verbally on whether they had any knowledge of epilepsy. Overall, this group appeared to be generally well aware of the existence of this chronic health condition. The respondents were, however, less well informed about the facts and details of epilepsy, with the estimates varying widely. Nevertheless, a general pattern could be observed from the responses provided by the respondents. A significant proportion of the study population believed that epilepsy is not a type of mental illness or insanity (75.2%). A relatively higher percentage of people labelled epilepsy as a form of insanity in

Table VI. Responses to questions regarding the most concerned condition of a new colleague (Q22) (n = 629).

Preference	No. (%)					
	1	2	3	4	5	6
A person who had a heart attack a year ago	123 (19.5)	136 (21.5)	123 (19.5)	89 (14.2)	116 (18.4)	42 (6.7)
A wheelchair user	113 (17.8)	97 (15.3)	101 (16.0)	119 (18.9)	133 (21.1)	66 (10.5)
A person with epilepsy who had two seizures in the last year	63 (10.0)	145 (23.0)	134 (21.2)	164 (26.1)	101 (16.0)	22 (3.5)
A person older than 50 years	33 (5.25)	36 (5.7)	39 (6.19)	68 (10.8)	102 (16.2)	351 (55.9)
A person who had been sick with stress/depression for last 3 months in last year	184 (29.2)	125 (19.8)	139 (22.0)	87 (13.8)	64 (10.1)	30 (4.7)
A person whose face has been disfigured by burns	113 (17.9)	91 (14.4)	94 (14.9)	100 (15.9)	114 (18.1)	117 (18.6)

NB: 1: most concerned; 6: least concerned

Germany (20%), while Italy (8%) and the United States (3%) recorded lower percentages.⁽²²⁻²⁴⁾ In New Zealand, however, almost all the respondents (96%) did not regard epilepsy as a type of mental illness or insanity.⁽¹⁷⁾

The questions measuring the understanding of the respondents on epilepsy reflected better conception and perception, where the majority of the respondents (64.3%) believed that epileptics are not slow learners. The responses that projected a poor understanding of epilepsy were more likely to be furnished by female rather than male respondents. In conjunction with their positive responses on the majority of the questions addressing the understanding of epilepsy, 42.2% of respondents also believed that society does not discriminate against people with epilepsy or that they are not treated differently by society, contrary to the results of a study carried out in the United Kingdom by Jacoby et al,⁽³⁾ where more than half of the respondents agreed that people with epilepsy were treated differently by society. This feedback, together with several other responses pertaining to the understanding of epilepsy, was reasonably encouraging.

Surprisingly, but perhaps understandably, an almost equal number of respondents agreed and disagreed that epilepsy is a hindrance to a happy life (Table II). This suggests that the respondents recognised that those affected have the potential to lead an ordinary and happy life and be successful in the same life domains as others, but are limited from doing so by society. A study conducted in the United Kingdom arrived at the same conclusion.⁽³⁾ This statement is further reinforced by the fact that 72% of the respondents either agreed or strongly agreed that epileptics can be as successful as others in their chosen careers. Nevertheless, more than a quarter (33%) of the respondents in this study sample either agreed or strongly agreed that people with epilepsy have more personality problems than others. Despite having a better understanding, some respondents (57%) strongly agreed or tended to agree that it is frightening for them or others to see someone having a seizure.

When asked how the respondents would react if someone they know has epilepsy, about 83% gave positive feedback; they would treat them as before. A study by Nicholaos et al in Greece found that 6.5% of the respondents would feel awkward or fearful and would prefer to stop associating with this person,⁽²⁰⁾ as compared to only 2% in this study. The same positive attitude was noted in 66.1% of the respondents, who responded that they would easily associate with an epileptic person socially, and 61% reported that they would easily become close friends with a person with epilepsy. This figure (61%) is, however, slightly lower than that obtained from the United Kingdom.⁽³⁾ This positive perception may be due to the higher level of education of the respondents, as university graduates and postgraduates alone made up more than half of our study population (Table I).

When the subject of exploration touched on more personal issues, the responses were considerably less negative than in similar studies conducted in China, among Chinese in Malaysia and with a different ethnic group in Kelantan, Malaysia. In this study, 42% of the respondents objected to their children marrying a person who has occasional seizures, in contrast to the relatively higher corresponding figure of 87% in China,⁽²⁵⁾ 43% among Malaysian Chinese⁽²⁶⁾ and 48% in Kelantan.⁽¹⁶⁾ Similarly, 3.6% of the respondents would object to or avoid having their children play or associate with a person with seizures, in comparison with the corresponding figure of 57% in China,⁽²⁵⁾ 9% among Malaysian Chinese⁽²⁷⁾ and 20% in Kelantan,⁽¹⁶⁾ while in New Zealand, 97% of the respondents had no objections.⁽¹⁷⁾ From these statistics, a reasonable explanation can be posited that the Chinese population in the urban areas of Malaysia, as represented by the respondents, recognised that epilepsy is a non-transmittable disease.

An interesting response was observed when the respondents were asked to put themselves in the shoes of an epileptic and consider how easily it would be to talk about their health condition with others. It was

found that more than half of the respondents preferred to confine it only to people who were very close to them, while 13.6% would maintain absolute secrecy about their condition. Interestingly, the study conducted in Greece obtained a similar outcome.⁽²⁰⁾ Objectively, this trend may well be related to the sense of personal inferiority attached to epilepsy itself, not to mention the fear of societal rejection and discrimination upon revealing the truth.

Fairly high percentages of respondents had doubts about whether people with epilepsy are capable of handling certain careers safely without causing immediate danger to either themselves or to the people in their vicinity. These occupations included lorry drivers, firefighters, doctors and armed forces personnel, with more than half the respondents concurring that these jobs are unsuitable for epileptics (Table V). A study conducted in the United Kingdom yielded similar findings.⁽³⁾ Although these responses suggested relatively high levels of prejudice toward people with epilepsy in the named occupations, a significant number of the respondents also remarked that the suitability of the occupation is also dependent on the specific tasks the epileptic is involved in. For example, many respondents found it acceptable for epileptics to work as general practitioners, but would object to the idea of them being surgeons.

Regarding the main causes of epilepsy, most of the studies provided a set of possible answers, including the option "I do not know", but in the present study, this option was replaced with the option "none of the above", so as to minimise ignorance on this matter. In this study, the majority of the respondents correctly categorised congenital factor (born with it or birth injury) as the leading cause of epilepsy (22.2%), which demonstrated the respondents' high level of understanding of epilepsy.

Significant associations were found between the educational level of the respondents and a few statements, including whether epileptics are as intelligent as the general population ($p = 0.009$), whether epilepsy can be treated with drugs ($p = 0.037$) and whether epileptics can be as successful as others in their chosen career ($p = 0.009$). Positive responses were mainly obtained from respondents with secondary and higher education. Female respondents and those aged 18–34 years were more inclined to believe that epileptics can be as successful as others. However, male respondents were more likely to agree that epileptics can be as intelligent as others, compared to female respondents.

The marital status of respondents was significantly

associated with the question on marrying epileptics themselves or allowing their children to marry epileptics ($p = 0.021$). It was found that unmarried respondents would more easily agree to marry epileptics. Moreover, there was also an association between the educational level and questions on social association with epileptics ($p = 0.035$), becoming close friends with epileptics ($p = 0.031$) and allowing their children to play with epileptics ($p = 0.036$). The level of education appeared to play a part in these associations, as the majority of the postgraduates and university graduates provided positive responses.

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REFERENCES

- Mirmics Z, Czizora G, Závecz T, Halász P. Changes in public attitudes toward epilepsy in Hungary: results of surveys conducted in 1994 and 2000. *Epilepsia* 2001; 42:86-93.
- Young GB, Derry P, Hutchinson I, et al. An epilepsy questionnaire study of knowledge and attitudes in Canadian college students. *Epilepsia* 2002; 43:652-8.
- Jacoby A, Gorry J, Gamble C, Baker GA. Public knowledge, private grief: a study of public attitudes to epilepsy in the United Kingdom and implications for stigma. *Epilepsia* 2004; 45:1405-15.
- Hermann BP, Whitman S, Wyler AR, Anton MT, Vanderzwegg R. Psychosocial predictors of psychopathology in epilepsy. *Brit J Psychiatry* 1990; 156:98-105.
- Collings JA. Psychosocial well-being and epilepsy: an empirical study. *Epilepsia* 1990; 31:418-26.
- Arnston P, Droge D, Norton R. The perceived psychosocial consequences of having epilepsy. In: Whitman S, Hermann BP, eds. *Psychopathology in epilepsy, social dimensions*. New York: Oxford University Press, 1986: 143-61.
- Harrison RM, West P. Images of a grand mal. *New Society* 1977; 40:762-82.
- Wells BG, DiPiro JT, Schwinghammer TL, Hamilton CW. *Pharmacotherapy Handbook*. 6th ed. Singapore: McGraw-Hill Medical, 2006: 516-7.
- Ziegler RG. Epilepsy: individual illness, human predicament and family dilemma. *Fam Rel* 1982; 31:435-44.
- Jacoby A, Snape D, Baker GA. Epilepsy and social identity: the stigma of a chronic neurological disorder. *Lancet Neurol* 2005; 4:171-8.
- Bagley C. Social prejudice and the adjustment of people with epilepsy. *Epilepsia* 1972; 13:33-45.
- Ablon J. The nature of stigma and medical conditions. *Epilepsy Behav* 2002; 3:2-9.
- Scambler G, Hopkins A. Being epileptic: coming to terms with stigma. *Soc Health Illness* 1986; 8:26-43.
- Schneider J. Disability as a moral experience: epilepsy and self in routine relationships. *J Soc Issues* 1988; 44:63-78.
- Fong CY, Hung A. Public awareness, attitude, and understanding of epilepsy in Hong Kong Special Administrative Region, China. *Epilepsia* 2002; 43:311-6.
- Ramasundrum V, Zabidi AMH, Chong TT. Public awareness,

- attitudes and understanding towards epilepsy in Kelantan, Malaysia. *Neurol J Southeast Asia* 2000; 5:55-60.
17. Hills MD, MacKenzie HC. New Zealand community attitudes toward people with epilepsy. *Epilepsia* 2002; 43:1583-9.
 18. Tran DS, Odermatt P, Singphuangphet S, et al. Epilepsy in Laos: knowledge, attitudes, and practices in the community. *Epilepsy Behav* 2007; 10:565-70.
 19. Radhakrishnan K, Pandian JD, Santhoshkumar T, et al. Prevalence, knowledge, attitude, and practice of epilepsy in Kerala, South India. *Epilepsia* 2000; 41:1027-35.
 20. Diamontopoulos N, Kaleyias J, Tzoufi M, Kotsalis C. A Survey of public awareness, understanding, and attitudes toward epilepsy in Greece. *Epilepsia* 2006; 47:2154-64.
 21. Ab Rahman AF. Awareness and knowledge of epilepsy among students in a Malaysian university. *Seizure* 2005; 14:593-6.
 22. Thorbecke R, Rating D. [What one thinks about epilepsy?] *Epilepsie Blätter* 1996; 9:71-5. German.
 23. Canger R, Cornaggia C. Public attitudes towards epilepsy in Italy: results of a survey and comparison with USA and West German data. *Epilepsia* 1985; 26:221-6.
 24. Caveness W, Gallup GH Jr. A survey of public attitudes towards epilepsy in 1979 with an indication of trends over the past thirty years. *Epilepsia* 1980; 21:509-18.
 25. Lai CW, Huang X, Lai YHC, et al. Survey of public awareness, understanding and attitudes toward epilepsy in Henan province, China. *Epilepsia* 1990; 31:182-7.
 26. Malaysian society of epilepsy [serial online] 2007; Available at: www.epilepsy.org.my/index.php. Accessed July 12, 2008.
 27. Lim KS, Tan LP, Lim KT, Tan CT. Survey of public awareness, understanding and attitudes towards epilepsy in Malaysia. *Neurol J Southeast Asia* 1999; 4:31-6.

Appendix**Questionnaire****I. A. (Demographic Data):**

Gender: Male Female Age (y): _____ Race: Malay Chinese Indian Others

Marital Status: Married Unmarried Children: Yes No

Education: No schooling Primary schooling Secondary schooling University Postgraduate

Employment Status: Unemployed Labour Professional Student Housewife Retired

Hometown: _____ Residence: Rural Urban

I. B. Attitudes toward Epilepsy:

1. Do you think that epilepsy is a type of mental retardation? Yes No Don't know
2. Do you think that epilepsy is a type of insanity or madness? Yes No Don't know
3. Do you think that epilepsy is a hindrance to a happy life? Yes No Don't know
4. Is it possible for an epileptic patient to lead a married life? Yes No Don't know
5. Is it possible for an epileptic patient to lead a normal sexual life? Yes No Don't know
6. Do you think that society discriminates against persons with epilepsy? Yes No Don't know
7. Do you think that epileptic patients should be isolated from the normal population? Yes No Don't know
8. Do you think that epileptic patients can perform daily life activities? Yes No Don't know
9. Do you think that epileptic patients can receive academic education? Yes No Don't know
10. Do you think that epileptic patients should not participate in sports? Yes No Don't know
11. Do you think that epileptic patients can become useful members of the society? Yes No Don't know

Note: For the purpose of this questionnaire, an epileptic is a person who occasionally has a seizure but is otherwise normal.

12. If you had epilepsy, how easily would you talk about it with other people?

- I would keep it as a secret from everybody.
- I would talk about it only to people very close to me.
- I would talk about it freely with anyone.
- I don't know or wish to answer.

13. How you would react if you learnt that someone you know has epilepsy?

- I would treat him as before.
- I would feel a little awkward and afraid and I would rather avoid him.
- I would feel very awkward and afraid and I would stop contacting him.
- I don't know or wish to answer.

14. Would you like to associate with him/her in social situations?

- I would easily do it.
- I would be a little hesitant about it.
- I would be very hesitant about it.
- I would avoid it.

15. Could you become a close friend with him/her?

- I would easily do it
- I would be a little hesitant about it.
- I would be very hesitant about it.
- I wouldn't do it.

16. Would you agree to marry (yourself or your children) him/her provided this person is otherwise acceptable?

- I would easily agree.
- I would be a little hesitant about it.
- I would be very hesitant about it.
- I would avoid it.

17. Would you hire him in your own business provided he has the skills or qualifications for it?

- I would hire him.
- I would hire him under certain circumstances.
- I would be very hesitant to hire him.
- I wouldn't hire him.

18. Would you agree to let your children play with and have as a friend another child with epilepsy?
- I would easily agree with it.
 I would be a little hesitant about it.
 I would be very hesitant about it.
 I would avoid it.
19. If a person close to you were to have a disease, which one would you "prefer" it to be?
- Epilepsy
 Diabetes
 Asthma
 Hypertension
 Schizophrenia
20. Which, if any, of the following jobs do you think that people with epilepsy should not be employed in?
- Teacher
 Nurse
 Doctor
 Pharmacist
 Police officer
 Lorry driver
 Fire fighter
 Factory worker
 Sports player
 Armed forces
 None of the above
21. How strongly do you agree or disagree with the following statements:
- a) People with epilepsy are as intelligent as everyone else.
 Strongly disagree Disagree Neutral Agree Strongly agree
- b) People with epilepsy have more personality problems than other people.
 Strongly disagree Disagree Neutral Agree Strongly agree
- c) It is frightening for others to see someone having an epileptic seizure.
 Strongly disagree Disagree Neutral Agree Strongly agree
- d) Doctors can successfully treat epilepsy with drugs in most cases.
 Strongly disagree Disagree Neutral Agree Strongly agree
- e) People with epilepsy can be as successful as other people in their chosen career.
 Strongly disagree Disagree Neutral Agree Strongly agree
22. Suppose a new colleague comes to work with you with one of conditions, please start with condition that would cause the most concern, and finish with the condition that would cause the least concern?
- A person who had a heart attack a year ago.
 A wheelchair user.
 A person with epilepsy who had two seizures in the last year.
 A person older than 50 years.
 A person who had been sick with stress/depression for the last 3 months last year.
 A person whose face has been disfigured by burns.
23. Which of the item listed on this card do you think are the main causes of epilepsy?
- Accident (e.g head injury)
 Brain disorder
 Problem with nervous system
 Mental illness
 Stress/pressure
 Born with it/birth injury
 Result of another illness or disease
 Old age
 Alcohol or drug abuse
 An infection caught from other people
 None of these