

SPECIAL TOPICS / MISE AU POINT

AWARENESS, KNOWLEDGE AND ATTITUDES TOWARDS EPILEPSY: A REVIEW OF A DECADE'S RESEARCH BETWEEN 2000 AND 2010

PRISE DE CONSCIENCE, CONNAISSANCE ET ATTITUDES ENVERS L'ÉPILEPSIE: REVUE D'UNE DÉCENNIE, 2000 - 2010

LUA Pei Lin ¹NENI Selamat Widiasmoro ¹

1. Centre for Clinical and Quality of Life Studies, Faculty of Medicine and Health Sciences, Universiti Sultan Zainal Abidin, Terengganu, Malaysia

E-Mail Contact - LUA Pei Lin : peilinlua (at) unisza (dot) edu.my

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ABSTRACT

The medical literature related to awareness, knowledge and attitudes (AKA) towards epilepsy was reviewed from the perspective of research trend since 2000 until 2010. Several databases i.e. PubMed, Science Direct, MedLine, Genamics, EBSCO Host and Springer Link were assessed to search for the relevant literatures using the keywords; epilepsy, awareness, knowledge, attitudes, 2000-2010. Three main parameters were measured i.e. awareness, knowledge and attitudes. Our review showed that despite a general high level of awareness, there was a serious lack of accurate knowledge regarding epilepsy which has probably led to the widespread of negative attitudes towards people with epilepsy (PWE) as well as the disease itself. Attitudes were the most commonly-measured parameter for the past ten years. It is also apparent that AKA level was better in developed countries compared to developing and poorer countries. Apart from that, methodological issues, challenges for future research, suggestions and future research directions were also discussed. Further worldwide research on AKA towards epilepsy should be targeted with a view to develop more innovative and effective epilepsy-educational programme to ensure that treatment is consistently accompanied by sound AKA in attempts to improve patients' health-related quality of life (HRQoL).

INTRODUCTION

Epilepsy, a universal disorder that affects nearly 50 million people in the world has always been poorly understood by society and has frequently been associated with numerous myths and beliefs. Cultural beliefs and misconceptions about epilepsy coupled with its occasional dramatic clinical manifestations influence the care-seeking behaviour of people with epilepsy (PWE), with a large proportion of epileptic population in certain countries resorting to complementary and alternative medicine for treatment despite the advancement in conventional treatment. This phenomenon thus highlights the importance of improvement in awareness, knowledge, practices and attitudes towards epilepsy among patients, their families or caregivers as well as the public in attempt to ensure health-related quality of life (HRQoL) is not compromised. Although the HRQoL of PWE is primarily determined by the duration of the disease and the extent of seizure control, other non-epileptic parameters such as social and psychological factors have also been shown to be critically important. These closely interrelated social factors include social anxiety, parental anxiety, employment and social stigma [1,2].

Measuring awareness is important in order to obtain a general perception and picture among the surrounding people towards epilepsy. Hence, there is a clear indication to objectively assess the community's level of awareness about this ailment and subsequently work towards improving this condition [3]. Shafiq et al. [3] further identified a dearth of public awareness as an important factor in the high prevalence of negative attitudes towards epilepsy and epileptic people.

Knowledge with regard to epilepsy is another important factor in reducing the impact of seizures, potentially harmful self-management practices, and the emotional impact of both seizures and treatment because increased knowledge may lead to an improvement in HRQoL not only for patients but also their families [4,5,6]. Therefore, knowledge is a vital factor in improving the ability to cope successfully with epilepsy by

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minimizing its impact on social and psychological functioning [7]. Furthermore, knowledge about epilepsy would be helpful in diminishing the perceived stigmatization or feelings of social isolation among PWE [4]. Researchers and clinicians who wish to develop and implement such strategies should be encouraged to first familiarize themselves with the stigmatization which accompanies epilepsy, both actual and perceived [6].

It is well known that PWE are socially discriminated against on the ground of widespread negative public attitudes, misconceptions and defensive behaviours. The most frequent false beliefs imposed upon PWE are related to mental illness, retardation and emotional disturbances in the patients [8]. It is conceivable that negative attitudes displayed by the public towards epilepsy may have stemmed from deficient or incorrect information about epilepsy [3].

Stigma is defined as any social attribute that is deeply discrediting for an individual and, in the case of epilepsy, it can significantly affect the HRQoL of the patients in many everyday activities such as going to school, working, driving, creating a family and obtaining insurance. The stigma associated with any disorder is determined not only by the actual characteristics of the disorder but also by the social stereotypes concerning it, created by the lack of information, misconceptions and unfounded fears. In the case of epilepsy, stigma seems to be largely based on the public perception of epilepsy as a disease that can unpredictably cause a violent and frightening attack on the patient's mental faculties, that is incurable, that affects the patient's personality, and that may be transmitted to his/her offspring. Such perceptions, although not entirely or necessarily misconceptions, when become social stereotypes obviously cause prejudices and rejections towards anyone with epilepsy. Hence, if these problems are to be dealt with effectively, a systematic study concerning awareness, knowledge, and attitudes towards epilepsy is a necessary first step. Moreover, a review covering these significant investigations could be very beneficial in defining common areas of both deficiency and strength to improve what is lacking. Other than help to raise the understanding level of the progress that has been made in AKA towards epilepsy research, hopefully it can also provide direction as to where future efforts need to be focused and emphasized.

METHODS

Search strategy and selection criteria

The PubMed, Science Direct, MedLine, Genamics, EBSCO Host and Springer Link databases were searched using the keyword "epilepsy", combined with each of the following: "awareness", "knowledge" and "attitudes". When the first keyword, epilepsy was searched, 20,000,000 hits were obtained. When the word awareness was added, the results were decreased to 670,000 and later down to 114,000 when the third keyword, knowledge was included. With the final addition of the keyword, attitudes and the time frame (2000-2010), only 80 results surfaced. Sixty-six articles met the inclusion criteria which were: 1) research-based, 2) English language and 3) full-length articles. All related issues mainly from *Seizure* (European Journal of Epilepsy), *Epilepsy and Behaviour*, *Epilepsia* (The Journal of International League against Epilepsy), *Arquivos de Neuro-Psiquiatria*, *Neurosciences*, *Social Science and Medicine*, *Annals of African Medicine*, *Epileptic Disorders*, *Acta Neurologica Scandinavica*, *Journal of Indian Medical Association* and *Neurology Asia* (formerly known as *Neurological Journal of South East Asia*) and the *International Journal of Collaborative Research on Internal Medicine and Public Health* were included.

Data collection and analysis

A total of 66 research articles from 36 countries were found via PubMed, Science Direct, MedLine, Genamics, EBSCO Host and Springer Link databases. Basically, three parameters i.e. awareness, knowledge and attitudes were the main focus. The specific parameters and the main findings of each article were closely-examined for details such as authors, title of research, country, year and socio-demographic background to provide comprehensive information. Besides the demographic distribution of respondents, the investigations' design, study setting, year of publication, sample and number of sample were also dissected and categorized accordingly. Almost every country in Asia had conducted their own studies on awareness, knowledge and attitudes towards. Most articles had originated from Cameroon (n=6), Malaysia (n=5) and the United States of America (n=4). Three studies were conducted in each of these countries; South Korea, Brazil, Oman, Turkey, Zambia, Hong Kong and India. Greece, Vietnam, Jordan and Kuwait were represented by two studies respectively. On the other hand, only one study had been conducted in Iran, Sweden, Kenya, Hungary, Bengal, Pakistan, Laos, Bosnia and Herzegovina, Croatia, France, Trinidad and Tobago, Nigeria, Burkina Faso, Tanzania, New Zealand, United Arab Emirates, Senegal, Thailand, United Kingdom, Myanmar, Italy and Indonesia. This review has an international focus on patients', parents', families',

caregivers', healthcare providers' awareness, knowledge and attitudes towards epilepsy and provides a discussion of research trends for the past decade and recommendations for future directions.

RESULTS

Demographic indicators

From 2000 until 2010, the number of total population of respondents was approximately 98,381. However, the number of total population was smaller than expected because this information was not available in some literature - Table 1.

Age

The publications included in this review showed several age ranges. They covered children from as young as 10 to 16 years (n=22,069), young adults from 18 to 25 years (n=35,224), general adults from 29 to 49 years (n=18,432) and the elderly from 50 to 65 years (n=1,152). Hence, the group most-researched involved young adults, in whom epilepsy is not uncommon and the prevalence is high -Table 1.

Gender

The percentage of female respondents was generally higher (50.7% to 87.3%) than males (12.7% to 49.3%) in 43 research studies in almost all countries except for Italy, Thailand, Pakistan, Bengal, Oman, Jordan, UAE, Nigeria and Zambia in which the opposite was noted - Table 1.

Ethnicity, Religion and Locality

The respondents were largely represented by the main ethnic group within each country for several countries namely Malaysia, Hong Kong, South Korea, Pakistan, Oman, Kuwait, Jordan, Iran, Nigeria, Trinidad and Tobago, New Zealand, Greece and United State of America. While for other countries the highest number of respondents was represented by the major religion of the population, states or district with the largest population, mother tongue language of the population or location of the study - Table 1.

Location

Most of the AKA research were carried out in developing countries in which 22 articles had originated from Asia countries, 15 articles from the African continent and 13 articles from Middle East countries. Nonetheless, developed countries like the United States of America, United Kingdom, Canada, France, New Zealand, Greece, Italy and Sweden were covered by the rest of the articles (n=17) - Table 1.

Majority of the studies was based on cross-sectional design and they have been conducted throughout 35 different countries all over the world. The sample recruited (n = 98,381) included PWE, non-PWE, parents, healthcare providers, teachers, students, children and public whereby non-PWE was the majority. The most frequently assessed parameter for the past decade was attitudes, followed by knowledge, awareness, perception, familiarity, understanding, practice, belief and behaviour. The main findings for each study are summarized in Table 2.

Parameters

For the past decade, psychological and behavioural studies of epilepsy and seizure have been focused on measuring different parameters: awareness, knowledge, attitudes, perception, familiarity, understanding, practices, belief, and behaviour. Our review discovered that attitudes had been the most frequently-measured in almost every published research followed by knowledge, and awareness. The least common parameters measured were belief and behaviour. Beginning from the year 2004 onwards, there was an overall increase in the number of research on these parameters among PWE and other members of the community carried out globally - Figure 1.

DISCUSSION

This paper intends to provide a review of published research of AKA towards epilepsy. Data from previous studies over the past decade have provided a clearer picture of the overall overview on this matter. Moreover, methodological issues, challenges for future research, suggestions for future research directions and limitations were also discussed.

Overall findings

According to this review, the awareness level in almost every country was mostly high, between 80% and 100%. High prevalence of this disease i.e. 50 million PWE worldwide could be one of the reasons that people are rather aware of the disease. The familiarity towards this disease was also considerably high since a huge proportion of the public mingled with PWE in their daily life within their surrounding society. However, as compared to studies conducted in other countries, the awareness level of epilepsy in poor communities is still limited and this gives rise to negative attitudes and poor practices [28].

Despite high awareness level, knowledge level however was still very limited. Obviously, the main problem was lack of accurate knowledge regarding this illness. Moreover, the existence of incorrect knowledge plus false beliefs surrounding this disease has commonly been spread from person to person among the community, worsening the matter. This indicated that epilepsy education has been largely inadequate and ineffective especially in developing countries. Educational programmes should be implemented continuously among children, youth, adults and the elderly. They need to be constantly-equipped with up-to-date knowledge via the most effective ways. Thus, development of epilepsy education programme utilizing all sorts of resources such as the internet, mass-media and telecommunication systems could play a crucial role in improving the knowledge in this ICT-driven era.

Overall, negative attitudes were still prominent. The attitudes toward epilepsy could be considered as negative among public all over the world except for in the United States of America [22]. The public possessed a positive attitude about their association with PWE, their employment, having children or even their ordinary life in the community [47] but they imposed a negative attitude with regard to their children associating with PWE and marrying epileptic person like those in Hong Kong [70] and Malaysia [46]. Although epilepsy is a well-known disease, negative attitudes unfortunately still prevail [16]. People in rural communities especially perceive epilepsy as a feared and dreaded disease because of its alleged association with evil spirits and witchcraft [26]. Consequently, PWE faces serious social stigmatisation and may even be ostracized by the society [38]. The majority of negative attitudes were significantly associated with the misunderstanding of epilepsy in the first place [16], emphasizing the importance of health education for the people.

Expectedly, respondents in developed countries demonstrated an overall better AKA level compared to people in developing countries. Specifically, population in developed countries like the United States of America [22], United Kingdom [42], New Zealand [40], Greece [44] and France [61] demonstrated better AKA compared to developing countries like Asian countries, Middle East countries as well as African countries. This could be due to better education, higher socioeconomic status and significantly enhanced level of thinking possessed by respondents in developed countries such as the United States of America, German, and Japan. However, in countries with low resources, poor awareness about epilepsy, stigma associated with the disorder, ignorance about its treatment and restricted access to healthcare have imposed a negative influence on AKA as well as on their HRQoL. Differences in public AKA between eastern and western countries might also reflect the underlying sociodemographic and cultural differences in the perception of this condition. These sociodemographic and cultural differences could probably be influenced by political situation, economic growth, education system, health policy and sociocultural diversity in the respective countries.

Overall, attitudes have been identified as the most commonly-measured parameter in AKA followed by knowledge and awareness. This is rather expected since this illness is frequently associated with stigmatisation, prejudice and discrimination. Therefore, assessing attitudes is certainly crucial in order to determine the level of stigma towards this brain disorder.

Methodological issues and challenges for future research

The largest problem in most research is the lack of outcome studies to test for the effectiveness of interventions. Out of the 66 studies conducted, only one was an intervention study, while the rest were all non-interventional. There should be more intervention studies as a continuity of the usually-conducted cross-sectional studies since most have suggested that almost similar educational programmes should be embarked as the best solutions for the problem. Interventional studies could be in the form of developing and testing educational programme, launching awareness campaign, introducing medical education or even developing new system or device with the primary objective of improving knowledge.

Another pertinent issue with the assessment measures employed was that some terms were not standardized across studies. For example "awareness", "familiarity", "knowledge", "understanding", "perception", "belief", "behaviour", "practices" and "attitudes" towards epilepsy were measured by different scales in different studies. This makes comparisons of the effectiveness of different approaches rather tedious and could not be standardized. Another reasonable concern is whether these scales measure the parameters in a meaningful way. For example, exactly how does one measure "awareness", "knowledge" or "attitudes" in a series of yes-no-not sure questions or Likert rating scales? When a significant change is statistically shown on such measurements, does it actually reflect a clinically significant change [73] in respondents' level of AKA? These concerns could probably be addressed in future instrument development with more meaningful interpretation between scale scores and real-life adaptation and practice.

Furthermore, there was no established and standardized instrument for measuring AKA. Most questionnaires have been developed by researchers specifically for the purposes of their studies alone, assessing their desired parameters. Because of this, these instruments vary in their scope/objectives and some cover a wide range of topics, which makes it rather difficult to compare and draw general conclusions on the overall attitude and degree of knowledge of PWE. Some researchers did not give identification name for their developed questionnaires. Hence, it is inconvenient to gather and clearly identify the instruments which have been utilized for this type of study for many years before.

Amongst others too, researchers or instrument developers did not seem keen to address the impact of different types of epilepsy namely primary generalized seizure and partial seizure with a variety of accompanying subtypes i.e. absence seizure, atypical absence seizure, myoclonic seizure, atonic seizure, tonic seizure, clonic seizure, tonic clonic seizure, simple partial seizure, complex partial seizure and secondary generalized seizure. Each subtype requires specific needs whether in terms of treatment or regular daily basis and faces slightly different psychosocial issues. Therefore, it is neither appropriate nor accurate to utilise similar instrument for PWE who are diagnosed with different subtypes of epilepsy. The domains and items could probably be modified to suit the major issues affecting them. Hence, developing specific instrument according to subtypes of epilepsy could be another step forward in research of this nature. Suggestions and future research directions

Epilepsy education campaign and health promotion have been shown to be effective in improving health outcomes of PWE. Educational programmes to enhance epilepsy self-management have often shown improvements in knowledge. A study carried out in Hungary [8] demonstrated that educational campaigns are effective in changing as well as improving knowledge about epilepsy among the population and diminish the negative attitudes against PWE [33]. Larger and comprehensive community-based educational programme is very much essential to bring about a change in negative attitude towards epilepsy [21]. Therefore, more interventional focus on epilepsy education including PWE, their families, caregivers and public should be devised, tested and implemented over-time in efforts to gradually alter knowledge and attitude components of PWE as well as their surrounding community.

Rather than dealing with the clinical manifestations of epilepsy alone, PWE are equally (if not more) affected by the psychosocial issues surrounding it. Because of that, besides being treated medically, PWE should also opt for psychosocial treatment or alternative therapies. However, according to Mittan [73], the development of psychosocial treatment programs in epilepsy such as educational interventions, computer-based patient education, medical education and counseling therapies has not kept pace with the development of medical treatments nowadays. This is a very troubling state of affair given that the provision of pharmacological therapies should ideally be balanced with psychosocial intervention services. Formal psychosocial treatment interventions definitely require a structured programme and sustainable funding incentives by authorities in their respected fields. These interventions, for example, including books, pamphlets and a host of epilepsy association programs should utilise the increasingly popular internet resources and devices for maximum impact and effectiveness on health outcomes.

Apart from quantitative measures, qualitative approaches were also necessary to uncover the ongoing psychosocial problems surrounding epilepsy in more depth. According to Cresswell [74] and Green and Thorogood [75], a qualitative approach is required to examine what underlines social processes and to establish what they mean and how people make sense of this meaning in their lives. This approach will further allow researchers to achieve explanatory depth, relate particular aspects of behavior to a wider context, and allow for the discovery of any unexpected issues. Therefore, it is only reasonable for more qualitative measures to be included in future research.

Limitations

There are several limitations in this review. First, it was limited to only English-language literature, whilst it should be noted that there may be non-English journal articles available which were not identified and analysed. Besides that, this review did not include manual search of articles which are very limited in our resource centre. Our electronic searches also only covered research articles from two electronic databases namely Medline and Science Direct. In addition, articles were reviewed mainly by their title and abstract, those containing relevant AKA-related information as a minor portion of the results could have been overlooked. Hence, it should be noted that there may be published research articles which could have been overlooked, in which a more comprehensive coverage and analysis could have been carried out if they were accessible.

CONCLUSION

This review highlights the ever-growing need for further research on AKA towards epilepsy. Limited knowledge and the widespread negative attitudes towards this brain disorder despite its prevalence and high awareness in the society indicated that serious attention plus various measures have to be taken to overcome this hurdle. The obvious gap between the AKA level of respondents in developed countries in comparison to those in developing and poor countries emphasizes the critical importance of epilepsy education in addition to effective delivery methods to the targeted population. In the developed nations, high level of literacy, wider scope of media coverage and accessibility of healthcare services to the community have resulted in better understanding and a remarkable decline in misperceptions and myths of the nature of epilepsy. Expectedly, attitude was the most commonly-measured parameter followed by knowledge and awareness since this illness is frequently associated with stigmatisation, prejudice and discrimination. Methodological short-comings and future challenges should also be tackled in order to attain the ultimate goal of patient-centered management - improvement of the quality of life. Future research directions could be introduced for more improvised and impactful outcomes besides the limitations and suggestions that need to be taken into consideration.

CONFLICT OF INTEREST STATEMENT

The author of this review article is also the author of Awareness, Knowledge and Attitudes Towards Epilepsy Among Rural Populations In East Coast Peninsular Malaysia: A preliminary exploration which has been published in Seizure 2010; 19:280-90.

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Table 1. An overview of demographic indicators of the research articles according to country and year.

No	Country	Year	Title	Age (year) Mean/Mean • SD/R ange	Gender (%)/ratio	Ethnicity/Religion/ Locality (%)
1	Bengal	2007	Epilepsy awareness among parents of school children: a municipal survey	NA	Male = 76.9 Female = 23.1	NA
2	Bosnia and Herzegovina	2009	First population study of the general public awareness and perception of epilepsy in Bosnia and Herzegovina	15.0 to 66.0	Male = 48.0 Female = 52.0	Urban = 48.3 Rural = 51.7

3	Brazil	2007	Awareness, attitudes and perceptions on epilepsy in Southern Brazil	32.2 • 14.8	Male = 26.4 Female = 73.6	NA
		2007	Knowledge and attitudes toward epilepsy amongst students in the health area: intervention aimed at enlightenment	NA	NA	NA
		2001	Knowledge and attitudes toward epilepsy among primary, secondary and tertiary level teachers	29.0 to 49.0	Male = 33.3 Female = 66.7	NA
4	Burkina Faso	2004	Knowledge of epilepsy and attitudes towards the condition among schoolteachers in Bobo-Dioulasso (Burkina Faso)	30.0 to 50.0	Male = 46.5 Female = 53.5	Christian = 68.4 Muslim = 30.3 Others = 1.3
5	Cameroon	2010	Knowledge, attitudes and practices with respect to epilepsy among student nurses and laboratory assistants in the South west Region of Cameroon	26.0 • 4.0	Male = 19.0 Female = 81.0	Catholic = 49.0 Protestant = 47.0 Others = 4.0
		2010	A community survey of knowledge, perceptions, and practice with respect to epilepsy among traditional healers in the Batibo Health District, Cameroon	52.1 • 15.9	Male = 90.0 Female = 10.0	Catholic = 35.3 Protestant = 53.9 Others = 10.8
		2009	A survey of public knowledge, attitudes, and practices with respect to epilepsy in Badissa village, Centre Region of Cameroon	48.1 • 15.0	Male = 57.3 Female = 42.7	Sanaga = 95.7 Others = 4.3
		2009	General public knowledge, attitudes, and practices with respect to epilepsy in the Batibo Health District, Cameroon	35.2 • 14.7	Male = 47.0 Female = 53.0	NA
		2009	General public awareness, perceptions, and attitudes with respect to epilepsy in the Akwaya Health District, South-West Region, Cameroon	34.6 • 1.9	Male = 54.0 Female = 46.0	Animist = 5.4 Catholic = 50.2 Muslim = 2.8 Protestant = 41.6
		2009	Public awareness, perceptions, and attitudes with respect to epilepsy in Ebolowa and Sangmelima - Urban Cameroon	27.4 • 10.4	Male = 56.1 Female = 43.9	NA
6	Croatia	2009	First population study of the general public awareness and perception of epilepsy in Croatia	15.0 to >66.0	Male = 47.5 Female = 52.5	Urban = 58.2 Rural = 41.8

7	France	2010	Knowledge of epilepsy in the general population based on two French cities: implications for stigma	48.7 • 18.4	Male = 47.4 Female = 52.6	Haute-Vienne = 49.7 Creuse = 50.3
8	Greece	2006	A survey of public awareness, understanding, and attitudes toward epilepsy in Greece	20.0 to 60.0	Male = 49.3 Female = 50.7	Greeks = 94.5 Immigrants = 5.5
		2005	Knowledge and attitude of the Greek educational community toward epilepsy and the epileptic student	35.0 to 50.0	Male = 49.3 Female = 50.7	NA
9	Hong Kong	2004	Pilot survey of public awareness, attitudes and understanding towards epilepsy in Hong Kong	28.0 • 15.0	Male = 52.0 Female = 48.0	Cantonese = 92.1 Mandarin = 6.9
		2002	Public awareness, attitude and understanding of epilepsy in Hong Kong Special Administrative Region, China	NA	Male = 46.2 Female = 53.8	Cantonese = 100.0
		2002	Public awareness, attitude, and understanding of epilepsy in Hong Kong	NA	NA	NA
10	Hungary	2001	Changes in public attitudes toward epilepsy in Hungary: results of surveys conducted in 1994 and 2000	1994 = 50.0	Male = 47.2 Female = 52.8	Urban = 63.3 Rural = 36.7
				2000 = 46.5	Male = 47.0 Female = 53.0	Urban = 63.6 Rural = 36.4
11	India	2010	Knowledge, attitude and practices among patients of epilepsy attending tertiary hospital in Delhi, India and a review of Indian studies	18.0 to 60.0	Male = 60.0 Female = 40.0	Hindus = 74.2 Muslims = 25.8
		2008	Knowledge, awareness and attitude about epilepsy among schoolteachers in India	NA	Male = 61.8 Female = 38.2	Urban = 32.9 Rural = 67.1
		2006	High school students' knowledge, attitude, and practice with respect to epilepsy in Kerala, Southern India	14.9 • 0.8	Male = 44.4 Female = 55.6	Muslims = 50.9 Hindus = 48.6 Christians = 0.5
12	Indonesia	2004	Public awareness, understanding and attitude towards epilepsy in Bandung, Indonesia	Male = 39.0 Female = 36.0	Male = 46.3 Female = 53.7	NA
13	Iran	2009	Awareness, understanding and attitudes towards epilepsy among Iranian ethnic groups	38.9 • 14.1	Male = 47.6 Female = 52.4	Persian = 20.0 Azeri = 20.0 Kurd = 20.0 Lur = 20.0 Arab = 20.0

14	Italy	2007	A questionnaire study on knowledge of and attitudes toward epilepsy in school children and university students in Rome, Italy	Schoolchildren = 16.4 • 1.5	Schoolchildren Male = 54.7 Female = 45.3	School children = 344 University students = 253
				University students = 22.2 • 2.9	University students Male = 45.1 Female = 54.9	
15	Jordan	2007	Public knowledge and attitudes towards epilepsy in Jordan	26.7 • 10.1	Male = 51.0 Females = 49.0	NA
		2006	Knowledge of management of epilepsy in young adults in Jordan	26.7 • 10.1	Male = 50.8 Female = 49.2	Jordanian = 69.6 Palestinian = 10.6 Syrian = 11.5 Other = 8.3
16	Kenya	2006	Attitudes and practices of families and health care personnel toward children with epilepsy in Kilifi, Kenya	NA	NA	NA
17	Kuwait	2009	Knowledge of, perceptions of, and attitudes toward epilepsy among university students in Kuwait	21.1 • 1.8	Male = 44.0 Female = 56.0	Kuwaitis = 95.0 Others = 5.0
		2008	Public knowledge and attitudes toward epilepsy in Kuwait	34.1 • 10.0	Male = 43.1 Female = 56.9	Capital = 25.1 Hawalli = 24.8 Al-Farwaniyah = 20.6 Al-Ahmadi = 16.7 Al-Jahra = 12.8
18	Laos	2007	Epilepsy in Laos: knowledge, attitudes, and practices in the community	PWE = 30.7	Male:female 1.1:1.0	NA
			Villagers = 31.1	Male:female 1.1:1.0		
			Relatives = 42.8 • 15.0	Male = 34.0 Female = 66.0		
19	Malaysia	2010	Knowledge and Attitudes towards Epilepsy among Malaysian Chinese	34.7	Male = 49.0 Female = 51.0	Kuala Lumpur = 20.9 Penang = 18.3 Ipoh = 15.7 Klang = 15.2 Serdang = 10.5 Kajang = 10.2 Shah Alam = 9.2
		2010	Awareness, knowledge and attitudes towards epilepsy among rural populations in East Coast Peninsular Malaysia: A preliminary exploration	41.6 • 18.0	Male = 43.4 Female = 56.6	Malay = 94.0 Chinese = 5.2 Indian = 0.5 Others = 0.3
		2005	Awareness and knowledge of epilepsy among students in a Malaysian university	21.8 • 2.5	Male = 22.6 Female = 77.4	Malay = 60.7 Chinese = 26.0 Indian = 6.7 Others = 6.7

		2000	Public awareness, attitudes and understanding towards epilepsy in Kelantan, Malaysia	27.0	Male = 38.1 Female = 61.9	Malay = 81.0 Chinese = 6.0 Indian = 0.6 Others = 12.4
		1999	Survey of public awareness, understanding, and attitudes toward epilepsy among Chinese in Malaysia	NA	Male = 54.1 Female = 45.9	Chinese = 100.0
20	Myanmar	2002	Public awareness, attitude and understanding toward epilepsy among Myanmar people	31.0	Male = 42.6 Female = 57.4	Urban = 59.1 Rural = 40.9
21	New Zealand	2002	New Zealand community attitudes toward people with epilepsy	18.0 to >60.0	Male = 45.0 Female = 55.0	New Zealand European = 77.0 Maori (indigenous persons) = 10.0 Others = 13.0
22	Nigeria	2005	Knowledge, attitude and beliefs about epilepsy among adults in a Northern Nigerian Urban Community	18.0 to 71.0	Male = 56.0 Female = 44.0	Hausa-Fulani = 81.5 Yoruba = 9.5 Igbo = 5.0 Others = 4.0
23	Oman	2003	Patient's perspective on epilepsy: self-knowledge among Omanis	22.6 • 4.6	Male = 53.0 Female = 47.0	NA
		2001	Psychosocial aspects of epilepsy in Oman: attitude of Health Personnel	37.4 • 10.0	Male = 66.0 Female = 34.0	Indian = 41.0 Omani = 29.0 Sri Lankan = 15.0 Egyptian = 6.0 Pakistani = 4.0 Filipino = 3.0 Jordanian = 2.0
		2000	Attitudes of Omani physicians to people with epilepsy	35.6 • 9.6	Male = 66.0 Female = 34.0	Indian = 40.0 Omanis = 31.0 Sri Lankan = 10.0 Others = 19.0
24	Pakistan	2007	Epilepsy: public knowledge and attitude in a slum area of Karachi, Pakistan	16.0 to 45.0	Male = 63.0 Female = 37.0	Hindko = 34.0 Pashto = 32.0 Punjabi = 12.0 Urdu = 10.0 Others = 12.0
25	Senegal	2005	Prevalence of epilepsy its treatment gap and knowledge, attitude and practice of its population in sub-urban Senegal an ILAE/IBE/WHO study	0.0 to 40.0	Male = 46.9 Female = 53.1	NA
26	South Korea	2010	Familiarity with, knowledge of, and attitudes toward epilepsy among teachers in Korean elementary schools	38.4 • 10.2	Male = 12.7 Female = 87.3	NA

		2009	Familiarity with, understanding of, and attitudes toward epilepsy among people with epilepsy and healthy controls in South Korea	18.0 to 65.0	Male = 48.5 Female = 51.5	Kyungi-Do, Inchon = 52.5 Gyeongsang-do, Daegu, Busan, Ulsan = 36.4 Jeolla-do, Gwangju = 8.9 Others = 2.2
		2004	Familiarity with, knowledge of, and attitudes toward epilepsy in residents of Seoul, South Korea	44.6 • 14.9	Male = 32.6 Female = 67.4	NA
27	Sweden	1991	Attitudes of rural people in central Ethiopia toward epilepsy	18.0 to 45.0	Male = 41.6 Female = 58.4	Muslim = 53.7 Christian = 46.3
28	Tanzania	1993	Knowledge, attitude, and practice toward epilepsy among rural Tanzanian residents	40.2	Male = 50.0 Female = 50.0	NA
29	Thailand	2010	Public familiarity with, knowledge of, and predictors of negative attitudes toward epilepsy in Thailand	37.6	Male = 52.9 Female = 47.1	Capital = 16.3 Central = 22.6 North = 19.0 Northeast = 19.6 South = 22.5
30	Trinidad and Tobago	2009	Knowledge of, attitudes toward, and perceptions of epilepsy among college students in Trinidad and Tobago	21.6 • 3.6	Male = 43.0 Female = 57.0	Indian = 49.0 African = 29.0 Mixed = 21.0 Chinese = <1.0 Other = <1.0
31	Turkey	2010	Knowledge of, perception of, and attitudes toward epilepsy of schoolchildren in Ankara and the effect of an educational program	13.1 • 1.2	Male = 47.6 Female = 52.2	Ulubatli Hasan PS = 38.7 Nazim Akcan PS = 26.9 ATO 65th year PS = 34.4
		2009	Do knowledge of, perception of, and attitudes toward epilepsy affect the quality of life of Turkish children with epilepsy and their parents?	Children = 13.5 • 3.2	Children: Male = 56.8 Female = 43.2	NA
				Parents = 38.5 • 6.8	Parents: Male = 36.2 Female = 63.8	
		2007	Teachers' perceptions in central Turkey concerning epilepsy and asthma and the short-term effect of a brief education on the perception of epilepsy	NA	Male = 54.5 Female = 45.5	NA
32	United Arabic Emirates	1998	Public awareness and attitudes towards epilepsy in the United Arab Emirates	28.9 • 10.1	Male = 52.0 Female = 48.0	NA

33	United Kingdom	2004	Public knowledge, private grief: a study of public attitudes to epilepsy in the United Kingdom and implications for stigma	16.0 to 75.0	Male = 44.6 Female = 55.4	White British = 87.4 Other White = 4.6 Mixed = 1.0 Asian subcontinent = 3.6 Black British = 1.8 Chinese = 0.6 Any other = 1.0
34	United States of America	2010	Knowledge, attitudes, and practice toward epilepsy (KAPE): A survey of Chinese and Vietnamese adults in the United States	18.0 to >65.0	Male = 46.6 Female = 53.4	Chinese = 57.6 Vietnamese = 40.2
		2006	Teachers' knowledge about epilepsy and attitudes toward students with epilepsy: results of a national survey	42.8 • 10.8	Male = 14.5 Female = 85.5	White = 96.7 African-American = 2.1 Hispanic = 0.4 Native American = 0.4 Asian = 0.4
		2004	Teacher's attitudes toward students with epilepsy: results of a survey of elementary and middle school teachers	40.4 • 10.7	Male = 13.0 Female = 87.0	Central Kentucky = 48.5 Western Kentucky = 24.2 Eastern Kentucky = 27.3
		2002	Epilepsy familiarity, knowledge, and perceptions of stigma: report from a survey of adolescents in the general population	13.0 to 18.0	Male = 47.0 Female = 53.0	White/Caucasian = 63.0 Black/African-American = 14.0 Asian = 5.0 Latino = 12.0 Native American = 1.0 Others = 5.0
35	Vietnam	2007	Knowledge, attitudes and practice toward epilepsy among adults in Ba Vi, Vietnam: first report from the population-based EPIBAVI study	19.0 to 71.0	Male = 46.5 Female = 53.5	NA
		2003	Survey of public awareness, attitudes, and understanding toward epilepsy in Nhan Chinh, Hanoi, Vietnam, in 2003	15.0 to 80.0	Male = 38.0 Female = 62.0	NA
36	Zambia	2007	Epilepsy-related knowledge, attitudes, and practices among Zambian police officers	31.8 • 7.0	Male = 71.3 Female = 28.7	NA
		2007	Zambian health care workers' knowledge, attitudes, beliefs, and practices regarding epilepsy	34.3	Male = 23.0 Female = 77.0	Urban = 58.5 Rural = 41.5

		2006	Knowledge, attitudes, behaviours and practices regarding epilepsy among Zambian clerics	40.7	Male = 77.9 Female = 22.1	Catholic = 4.5 Liberal Protestant = 63.8 Strict Protestant = 28.6 Jehovah's witness = 3.1
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Table 2. An overview of study design, study setting, year, and sample that have assessed awareness, knowledge, and attitudes towards epilepsy from year 2000 to 2010.

No	Authors	<ul style="list-style-type: none"> Study design Study setting Year 	Respondents	Sample (n)	Parameters	Main findings
1	Ab Fatah Ab Rahman [9]	<ul style="list-style-type: none"> Cross-sectional Penang, Malaysia 2005 	University students	289	Awareness & Knowledge (AK)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Familiarity = moderate <input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Attitudes = indifferent
2	Al-Adawi et al [10]	<ul style="list-style-type: none"> Cross-sectional Muscat, Oman 2000 	Doctors	121	Knowledge & Attitudes (KA)	<input type="checkbox"/> Knowledge = excellent <input type="checkbox"/> Attitudes = negative
3	Al-Adawi et al [11]	<ul style="list-style-type: none"> Cross-sectional Oman 2003 	*PWE	107	Perspective & Knowledge (PK)	<input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Limited knowledge of PWE condition <input type="checkbox"/> Inaccurate indications of epilepsy and incorrect responses to safety and compliance <input type="checkbox"/> A need for improving PWE knowledge
4	Al-Adawi et al [12]	<ul style="list-style-type: none"> Cross-sectional Oman 2001 	Health personnel	121	Attitudes (A)	<input type="checkbox"/> Knowledge = excellent <input type="checkbox"/> Attitudes = negative (cognitive & behaviour) <input type="checkbox"/> Realities regarding PWE should be publicized - PWE are capable of having a normal life and being an integral part of society
5	Al-Rashed et al [13]	<ul style="list-style-type: none"> Cross-sectional Kuwait 2009 	University students	753	Knowledge, Perceptions & Attitudes (KPA)	<input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Misconceptions and negative attitudes = high

6	Atadzhanov et al [14]	<ul style="list-style-type: none"> • Cross-sectional • Zambia .2006 	Clerics	225	Knowledge, Attitudes, Behaviour & Practices (KABP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Familiarity not associated with more knowledge or tolerance <input type="checkbox"/> Younger clerics, urban dwellers, those with fewer children and those with more years of formal education - significantly more tolerant <input type="checkbox"/> More knowledgeable clerics - recommended PWE to seek care from physician <input type="checkbox"/> Formal education - the most important factor in determining tolerance towards epilepsy
7	Austin et al [15]	<ul style="list-style-type: none"> • Cross-sectional • United State of America • 2002 	High school students	19,441	Familiarity, Knowledge & Perception (FKP)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Attitudes = negative
8	Awad & Sarkhoo [16]	<ul style="list-style-type: none"> • Cross-sectional • Kuwait • 2008 	Healthy public volunteers	755	Knowledge & Attitudes	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Negative attitudes - significantly associated with misunderstanding of epilepsy
9	Aydin & Yildiz [17]	<ul style="list-style-type: none"> • Cross-sectional • Konya, Turkey • 2007 	Schoolteachers	275	Knowledge, Attitudes Practice (KAP)	<input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Practice = poor <input type="checkbox"/> Initial rates of acceptance of $\cdot\text{çCWE}$ = significantly low <input type="checkbox"/> A significant positive change in the teachers' perception of epilepsy after education program
10	Bagic et al [18]	<ul style="list-style-type: none"> • Cross-sectional • Bosnia and Herzegovina • 2009 	Adults	1,000	Knowledge, Perception & Attitudes (KPA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Familiarity = moderate <input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitude = positive <input type="checkbox"/> Perception = moderate <input type="checkbox"/> Practice = moderate <input type="checkbox"/> Positive attitudes correlated with knowing PWE and/or witnessing seizure <input type="checkbox"/> General awareness and attitudes approached those of developed countries

11	Bagic et al [19]	<ul style="list-style-type: none"> • Cross-sectional • Croatia • 2009 	Adults	1,000	Knowledge, Perception & Attitudes (KPA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Familiarity = moderate <input type="checkbox"/> Attitude = positive <input type="checkbox"/> Perception = positive <input type="checkbox"/> Practice = moderate <input type="checkbox"/> Positive attitudes correlated with knowing PWE and/or witnessing seizure
12	Bener et al [20]	<ul style="list-style-type: none"> • Cross-sectional • United Arab Emirates (UAE) • 1998 	Public residents	892	Awareness, Attitudes & Understanding (AAU)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Males and females were similarly familiar with the concept of epilepsy <input type="checkbox"/> Age group (20-29 years) and education (illiterate) had positive significant effect on awareness of epilepsy <input type="checkbox"/> AKA level in UAE < other Western countries
13	Bhattacharya et al [21]	<ul style="list-style-type: none"> • Cross-sectional • Bengal • 2007 	Parents of school-going children	1,068	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> False belief and negative attitudes lead to barrier in children education
14	Bishop & Boag [22]	<ul style="list-style-type: none"> • Cross-sectional • United States of America • 2006 	Elementary and middle school teachers	512	Knowledge & Attitudes (KA)	<input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = positive <input type="checkbox"/> Despite positive attitudes, there were significant deficits in general knowledge, its impact in educational settings and the appropriate management of epilepsy in classroom
15	Bishop & Slevin [23]	<ul style="list-style-type: none"> • Cross-sectional • Kentucky, United States of America • 2004 	Elementary and middle school teachers	135	Attitudes (A)	<input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Better scores predicted by more years of experience in teaching students with epilepsy
16	Bozkaya et al [24]	<ul style="list-style-type: none"> • Longitudinal • Turkey • 2010 	Primary schoolchildren	851	Knowledge, Perceptions & Attitudes (KPA)	<input type="checkbox"/> The epilepsy education program was found to be associated with a significant increase in knowledge and positive attitudes towards epilepsy <input type="checkbox"/> Students with higher socioeconomic levels performed better on both pre and post tests

17	Choi-Kwon et al [25]	<ul style="list-style-type: none"> • Cross-sectional • Korea • 2004 	Public volunteers	918	Awareness, Knowledge & Attitudes (AKA)	<input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> The significant reasons for negative attitudes - epilepsy was hereditary and untreatable <input type="checkbox"/> Word of mouth was most often referenced as a source of knowledge
18	Chomba et al [26]	<ul style="list-style-type: none"> • Cross-sectional • Zambia • 2007 	Health care workers	276	Knowledge, Attitudes, Beliefs & Practices (KABP)	<input type="checkbox"/> Knowledge = good <input type="checkbox"/> Attitudes = positive <input type="checkbox"/> Practice = good <input type="checkbox"/> Beliefs = moderate <input type="checkbox"/> Those who had received both didactic and bedside training and more recent graduates exhibited significantly greater knowledge <input type="checkbox"/> Greater knowledge was significantly associated with more social tolerance but having a family member with epilepsy was not <input type="checkbox"/> Most PWE are feared and/or rejected by both their families and community
19	Chung et al [27]	<ul style="list-style-type: none"> • Cross-sectional • United States of America • 2010 	Chinese-American adults Vietnamese-American adults	1,615 1,126	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Practices = moderate <input type="checkbox"/> Younger age, female, Chinese and higher level of education were associated with positive attitude and better knowledge <input type="checkbox"/> Noteworthy differences in attitudes and practices in relation to previous studies in Asian countries
20	Cuong et al [28]	<ul style="list-style-type: none"> • Cross-sectional • Nhan Chinh, Hanoi, Vietnam .2003 	Public volunteers	1,000	Awareness, Attitudes & Understanding	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Understanding = poor <input type="checkbox"/> Attitudes = indifferent/slight negative
21	Dantas et al [29]	<ul style="list-style-type: none"> • Cross-sectional • Brazil • 2001 	Primary, secondary and tertiary level teachers	300	Knowledge, Practice & Attitudes (KPA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate and limited <input type="checkbox"/> Attitudes = indifferent

22	Daoud et al [30]	<ul style="list-style-type: none"> • Cross-sectional • Jordan • 2007 	Adults	16,044	Knowledge & Attitudes (KA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Younger participants and those with higher education were significantly more positive towards epilepsy <input type="checkbox"/> Overall knowledge and attitudes comparable with Asian countries but more negative when compared to Western countries
23	Diamantopoulos et al [31]	<ul style="list-style-type: none"> • Cross-sectional • Greece • 2006 	Adults	750	Awareness, Understanding & Attitudes (AUA)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Understanding = moderate <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Public's rejection towards PWE = low <input type="checkbox"/> Negative predictive factors - older age, low educational level, unfamiliarity with epilepsy and erroneous beliefs
24	El Sharkawy et al [32]	<ul style="list-style-type: none"> • Cross-sectional • Kilifi, Kenya • 2006 	Children, parents and grandparents came from or were associated with, a population of children with active epilepsy	66	Attitudes & Practices (AP)	<input type="checkbox"/> Both positive and negative attitudes illustrated a wide variety of practices toward CWE <input type="checkbox"/> Usage of traditional, medical, educational and religious services vary between groups <input type="checkbox"/> Choice of services was affected by different socioeconomic factors, the complex interrelationship of which offers some explanation for the underutilization of .AEDs
25	Falavigna et al [33]	<ul style="list-style-type: none"> • Cross-sectional • Southern Brazil • 2007 	Inhabitants of Caxias do Sul	832	Familiarity, Awareness & Attitudes (FAA)	<input type="checkbox"/> Attitudes = less negative <input type="checkbox"/> Knowledge = poor <input type="checkbox"/> University students and graduates possessed better knowledge compared to others
26	Fong & Hung [34]	<ul style="list-style-type: none"> • Cross-sectional • Hong Kong • 2002 	Healthy public volunteers	1,128	Awareness, Attitudes & Understanding (AAU)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = positive

27	Fong & Hung [35]	<ul style="list-style-type: none"> • Cross-sectional • Hong Kong Special Administrative Region (HKSAR) • 2002 	Public volunteers without epilepsy	1,128	Awareness, Attitudes & Understanding (AAU)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Knowledge = moderate/lacking <input type="checkbox"/> Attitude = positive <input type="checkbox"/> Public attitudes = more negative than that in Western societies but was more positive than that of the Chinese in China or Taiwan
28	Gourie-Devi et al [36]	<ul style="list-style-type: none"> • Cross-sectional • Delhi, India • 2010 	People with epilepsy (PWE)	120	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Knowledge = good <input type="checkbox"/> Attitudes = positives <input type="checkbox"/> Regional KAP affected by literacy, awareness about epilepsy and practice of different systems of medicine or category of study population
29	Gunadharma [37]	<ul style="list-style-type: none"> • Cross-sectional • Bandung, Indonesia • 2004 	Public volunteers	1,000	Awareness, Understanding & Attitude (AUA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = positive
30	Haimanot et al [38]	<ul style="list-style-type: none"> • Cross-sectional • Central Ethiopia, Sweden • 1991 	Households	1,546	Attitudes (A)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Attitudes; 1) matrimonial associations = negative 2) sharing of accommodation = negative 3) physical contacts with PWE =negative <input type="checkbox"/> Very poor knowledge resulted in social deprivations and rejection of PWE
31	Hasan et al [39]	<ul style="list-style-type: none"> • Cross-sectional • Malaysia • 2010 	Adults	382	Knowledge & Attitudes (KA)	<input type="checkbox"/> Knowledge = good <input type="checkbox"/> Attitudes = positive
32	Hills & MacKenzie [40]	<ul style="list-style-type: none"> • Cross-sectional • New Zealand • 2002 	Adults	400	Knowledge & Attitudes (KA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = positive/favourable <input type="checkbox"/> Knowledge = high/well-informed <input type="checkbox"/> Young people, less educated, lower socioeconomic status and the Maori or non-European - low knowledge <input type="checkbox"/> Less-positive attitudes were found among older people

33	Hirfanoglu et al [41]	<ul style="list-style-type: none"> • Cross-sectional • Ankara, Turkey • 2009 	Children Parents	220 313	Knowledge, Attitudes & Perception (KAP)	<ul style="list-style-type: none"> <input type="checkbox"/> Poor school performance, less social support, less self esteem, higher anxiety, greater stigmatisation and more depressive symptoms - significantly documented in less knowledgeable children <input type="checkbox"/> Parents - significantly more knowledgeable about the AEDs used, understanding both the effects and the side effects of the medications <input type="checkbox"/> More knowledgeable parents - less restricted family activities & significantly less worrying <input type="checkbox"/> Knowledge about epilepsy is associated with less perceived stigmatisation, social isolation, depressive symptoms and misperceptions
34	Jacoby et al [42]	<ul style="list-style-type: none"> • Cross-sectional • United Kingdom • 2004 	General public	1,694	Knowledge & Attitudes (KA)	<ul style="list-style-type: none"> <input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Attitudes = indifferent/slight negative <input type="checkbox"/> Responses to a series of attitude statements indicated highly favourable attitudes <input type="checkbox"/> Responses were influenced by respondents' sociodemographic characteristics <input type="checkbox"/> Attitudes and knowledge gaps have the potential for discriminatory behaviour
35	Kabir et al [43]	<ul style="list-style-type: none"> • Cross-sectional • Northern Nigeria • 2005 	Adults	200	Knowledge, Attitudes & Beliefs (KAB)	<ul style="list-style-type: none"> <input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitudes = positive <input type="checkbox"/> Literate respondents were significantly more likely to exhibit positive feelings towards PWE when compared to non-literate subjects
36	Kaleyias et al [44]	<ul style="list-style-type: none"> • Cross-sectional • Greece • 2005 	Primary and secondary schoolteachers	300	Knowledge, Attitudes & Perceptions (KAP)	<ul style="list-style-type: none"> <input type="checkbox"/> Knowledge = high <input type="checkbox"/> Perceptions = positive <input type="checkbox"/> Attitudes = positive <input type="checkbox"/> Inability of most teachers to help a convulsing child <input type="checkbox"/> Teachers' own knowledge about epilepsy - significant factor in determining their responses

37	Lee et al [45]	<ul style="list-style-type: none"> • Cross-sectional • South Korea • 2010 	Teachers in elementary schools	664	Familiarity, Knowledge & Attitudes (FKA)	<input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Teachers with inaccurate clinical knowledge demonstrated negative attitudes towards marriage and employment of PWE
38	Lim et al [46]	<ul style="list-style-type: none"> • Cross-sectional • Malaysia • 1999 	Malaysian Chinese adults	379	Awareness, Understanding & Attitudes (AUA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Understanding = moderate/limited <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> The attitudes toward epilepsy were more favourable than people in Henan, China and Taiwan <input type="checkbox"/> Older people, married, have more children, lower education, medical professionals and those who stayed in rural area had better awareness <input type="checkbox"/> Negative attitudes associated with older age, being female, married, having more children and living in rural areas
39	Masoudnia [47]	<ul style="list-style-type: none"> • Cross-sectional • Yazd, Iran • 2009 	Five major ethnic groups	500	Awareness & Attitudes (AA)	<input type="checkbox"/> Iranian ethnic groups were significantly different in their awareness of epilepsy <input type="checkbox"/> Most ethnic groups emphasized physical causes of epilepsy and rejected metaphysical causes <input type="checkbox"/> Iranian ethnic groups' attitudes; 1) marriage with PWE = highly negative 2) living in isolation = highly negative 3) association with PWE = positive 4) employment = positive 5) having children = positive <input type="checkbox"/> Significant difference in their beliefs on the treatment of epilepsy
40	Mbewe et al [48]	<ul style="list-style-type: none"> • Cross-sectional • Zambia • 2007 	Police officers	175	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Practices = good
41	Mecarelli et al [49]	<ul style="list-style-type: none"> • Cross-sectional • Rome, Italy 	Schoolchildren University students	344 253	Knowledge & Attitudes (KA)	<input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Attitudes = negative

42	Millogo & Siranyan [50]	<ul style="list-style-type: none"> • Cross-sectional • Burkina Faso • 2004 	Primary schoolteachers	260	Knowledge & Attitudes (KA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate/unsatisfactory <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Majority were interested in training involving clinical manifestations, etiology and first-aid procedures
43	Mirnic et al [8]	<ul style="list-style-type: none"> • Longitudinal • Budapest, Hungary • 2001 	Public volunteers	1,000	Familiarity, Attitudes & Understanding (FAU)	<input type="checkbox"/> Attitudes (employment) = negative <input type="checkbox"/> Significant decreases in prejudice rates regarding all attitudes aspects - marriage, child associating, work <input type="checkbox"/> Young age, higher education, stayed in rural area and married showed significant differences in their attitudes
44	Ndoye et al [51]	<ul style="list-style-type: none"> • Cross-sectional • Senegal • 2005 	Sub-urban residents	2,263	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Knowledge = moderate/lacking <input type="checkbox"/> Attitudes = indifferent
45	Neni et al [52]	<ul style="list-style-type: none"> • Cross-sectional • East Coast Peninsular of Malaysia • 2010 	Rural residents	615	Awareness, Knowledge & Attitudes (AKA)	<input type="checkbox"/> Awareness = low <input type="checkbox"/> Knowledge = low <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Total AKA = poor <input type="checkbox"/> Gender-wise no significant difference in AKA level <input type="checkbox"/> Respondents with higher education significantly possessed better attitudes and higher Total AKA level vs. those with lower education level <input type="checkbox"/> Employed respondents reported significantly more favourable attitudes vs. unemployed respondents <input type="checkbox"/> Cohorts with higher income possessed both significantly better attitudes and better AKA
46	Njamnshi et al [53]	<ul style="list-style-type: none"> • Cross-sectional • Batibo Health District, Cameroon • 2010 	Traditional healers	102	Knowledge, Perceptions & Practice (KPP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> The significant independent predictors of attitudes - middle age, female, correct knowledge, and the misconceptions (epilepsy is contagious and it is a form of insanity)

47	Njamnshi et al [54]	<ul style="list-style-type: none"> • Cross sectional • Badissa Village, Centre Region of Cameroon • 2009 	Healthy volunteers	164	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Significant independent determinants of attitudes - the belief that epilepsy is a form of insanity, caused by mental illness, having read about epilepsy and being married
48	Njamnshi et al [55]	<ul style="list-style-type: none"> • Cross-sectional • Cameroon • 2009 	Patients without epilepsy, visitors and caregivers	302	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Predictors of negative attitudes - advanced age, lack of formal education and the belief that epilepsy is hereditary, contagious or a form of insanity
49	Njamnshi et al [56]	<ul style="list-style-type: none"> • Cross-sectional • Cameroon • 2009 	Healthy villagers	387	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Predictors of attitudes - male gender, low or no level of education, having children, knowledge of the cause of epilepsy and beliefs that epilepsy is contagious or is a form of insanity <input type="checkbox"/> High level of public awareness suggested a high prevalence but contrasted with prevailing negative attitudes
50	Njamnshi et al [57]	<ul style="list-style-type: none"> • Cross-sectional • Cameroon • 2010 	Student nurses and laboratory assistants	340	Familiarity, Attitudes, Understanding & Practices (FAUP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Familiarity = high <input type="checkbox"/> Knowledge = high <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Majority would recommend medical treatment for epilepsy <input type="checkbox"/> Independent predictors of attitudes - acquaintance with PWE, knowledge of the cause of epilepsy, the belief that epilepsy is contagious or it is a form of insanity, being male and being in the first year of studies

51	Njamnshi et al [58]	<ul style="list-style-type: none"> • Cross-sectional • Ebolowa and Sangmelima, Urban Cameroon • 2009 	Adults visitors and caregivers without epilepsy	456	Awareness, Perceptions & Attitudes (APA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = indifferent <input type="checkbox"/> Perception = moderate <input type="checkbox"/> Predictors of negative attitudes - the beliefs that epilepsy is hereditary and epilepsy is a form of insanity <input type="checkbox"/> Familiarity with and attitudes towards PWE were better than in other areas of Cameroon
52	Otoom et al [59]	<ul style="list-style-type: none"> • Cross-sectional • Jordan • 2006 	Young adults	16,044	Knowledge (K)	<input type="checkbox"/> Knowledge = high <input type="checkbox"/> Responses of the participants significantly differed with respect to age, gender, level of education and occupation <input type="checkbox"/> Most aspects of epilepsy management were well-informed
53	Pandian et al [60]	<ul style="list-style-type: none"> • Cross-sectional • Southern India • 2006 	High school students	1,213	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Most preferred allopathic treatment, many had faith in exorcism and visited religious places as ways to cure epilepsy <input type="checkbox"/> Familiarity with epilepsy was high, but misconceptions and negative attitudes were alarmingly high
54	Rafael et al [61]	<ul style="list-style-type: none"> • Cross-sectional • France • 2010 	Adults	1,777	Knowledge & Attitudes (KA)	<input type="checkbox"/> Knowledge = high <input type="checkbox"/> Attitudes = positive <input type="checkbox"/> Gaps in knowledge and erroneous beliefs prevailed, notably among men, old people and individuals with low level of education
55	Ramasundrum et al [62]	<ul style="list-style-type: none"> • Cross-sectional • Kelantan, Malaysia • 2000 	Public volunteers	839	Awareness, Attitudes & Understanding (AAU)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Understanding = moderate <input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Malay's attitudes were more negative than the Chinese <input type="checkbox"/> Malay population were familiar with epilepsy but had poor knowledge and negative attitudes

56	Rwiza et al [63]	<ul style="list-style-type: none"> • Cross-sectional • Tanzania • 1993 	Rural inhabitants	3,256	Knowledge, Attitudes & Practices (KAP)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Practices = moderate/lacking
57	Saengpattachai et al [64]	<ul style="list-style-type: none"> • Cross-sectional • Thailand • 2010 	Adults with no underlying epilepsy	1,581	Familiarity, Knowledge & Attitudes (FKA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate/limited <input type="checkbox"/> The main reason given for avoiding to help PWE was lack of proper first-aid knowledge, not negative attitudes towards PWE <input type="checkbox"/> The factors predicting negative attitudes - low educational level, unfamiliarity and misconception that epilepsy is a form of insanity <input type="checkbox"/> The attitudes of friends and parents towards PWE = strongly positive <input type="checkbox"/> Awareness of the epilepsy public organization = low
58	Shafiq et al [3]	<ul style="list-style-type: none"> • Cross-sectional • Pakistan • 2007 	Non-epileptics adults	487	Knowledge & Attitudes (KA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Attitudes = positive <input type="checkbox"/> Males significantly more likely to identify epilepsy as being non-infectious <input type="checkbox"/> Those who considered epilepsy to be infectious were significantly more likely to carry negative attitudes towards epilepsy
59	Tedrus et al [65]	<ul style="list-style-type: none"> • Longitudinal • Brazil • 2007 	Students - first phase - second phase	258 116	Knowledge & Attitudes (KA)	<input type="checkbox"/> Significant improvement in answering questions about etiology, epidemiology, education, work and attitudes after intervention - presentation of specific audio-visual material and discussion
60	Thacker et al [66]	<ul style="list-style-type: none"> • Cross-sectional • India • 2008 	Primary and secondary schoolteachers	568	Knowledge, Awareness & Attitudes (KAA)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Knowledge = high <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Despite a great degree of awareness, negative and wrong attitudes still exist

61	Tran et al [67]	<ul style="list-style-type: none"> • Cross-sectional • Laos • 2007 	PWE Family members Villagers in Vientiane province	83 83 156	Knowledge, Belief, Practices & Attitudes (KBPA)	<input type="checkbox"/> Knowledge = poor <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Misbelieve = significantly increased <input type="checkbox"/> Stigma = high
62	Tuan et al [68]	<ul style="list-style-type: none"> • Cross-sectional • Vietnam • 2007 	Adults	2,005	Knowledge, Attitudes, Behaviour & Practices (KABP)	<input type="checkbox"/> Awareness = moderate <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Knowledge = moderate <input type="checkbox"/> Familiarity, having heard of epilepsy, knew PWE or having seen seizure were associated with less negative attitudes <input type="checkbox"/> Knowledge still limited and attitudes more negative compared to some Western countries
63	Win & Soe [69]	<ul style="list-style-type: none"> • Cross-sectional • Myanmar • 2002 	Visitors Out patients (PWE) Hospital staffs	296	Awareness, Attitudes & Understanding (AAU)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Attitudes = negative <input type="checkbox"/> Understanding = poor
64	Wong et al [70]	<ul style="list-style-type: none"> • Cross-sectional • Hong Kong • 2004 	Chinese	233	Awareness, Attitudes & Understanding (AAU)	<input type="checkbox"/> Awareness = high <input type="checkbox"/> Understanding = moderate/lacking <input type="checkbox"/> Attitudes = favourable/possible <input type="checkbox"/> Open attitude towards epilepsy compared to previous studies in China and Taiwan (except in marital issues) <input type="checkbox"/> Western medicine is the treatment of choice
65	Yoo et al [71]	<ul style="list-style-type: none"> • Cross-sectional • South Korea • 2009 	PWE Healthy controls	384 1,540	Familiarity, Understanding and Attitudes (FUA)	<input type="checkbox"/> Familiarity with seizure did not differ significantly between the groups <input type="checkbox"/> Controls had significantly greater misunderstanding of the etiology and long-term prognosis compared to PWE <input type="checkbox"/> Attitudes expressed towards PWE were significantly different <input type="checkbox"/> Control subject expressed more negative attitudes towards PWE than did PWE themselves concerning potential relationship with their children (e.g. friendship, marriage) <input type="checkbox"/> Significant differences with respect to understanding and attitudes were found between PWE and controls

66	Youssef et al [72]	<ul style="list-style-type: none"> • Cross-sectional • Trinidad and Tobago • 2009 	College students	355	Knowledge, Attitudes & Perceptions (KAP)	<ul style="list-style-type: none"> □ Knowledge = moderate and limited □ Attitudes = positive □ Students who knew PWE scored significantly higher on knowledge and attitudes questions □ Students felt PWE are discriminated against and experienced stigmatisation
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Interpretation:

Awareness: 0-25% = low/poor, 26-75% = moderate/limited, 76-100% = high/good/excellent
 Knowledge: 0-25% = low/poor/lacking, 26-75% = moderate/limited, 76-100% = high/good/excellent
 Attitudes: 0-25% = negative, 26-75% = moderate/indifferent/slight negative, 76-100% = positive/favourable
 Understanding: 0-25% = low/poor, 26-75% = moderate/limited, 76-100% = high/good/excellent
 Practice: 0-25% = low/poor, 26-75% = moderate/limited/lacking, 76-100% = high/good/excellent
 Perception: 0-25% = negative, 26-75% = moderate/indifferent, 76-100% = positive
 Familiarity: 0-25% = low/poor, 26-75% = moderate/limited, 76-100% = high/good/excellent
 Belief: 0-25% = negative, 26-75% = moderate, 76-100% = positive
 *PWE = People with epilepsy
 □‡CWE = Children with epilepsy
 * AEDs = Anti-epileptic drugs

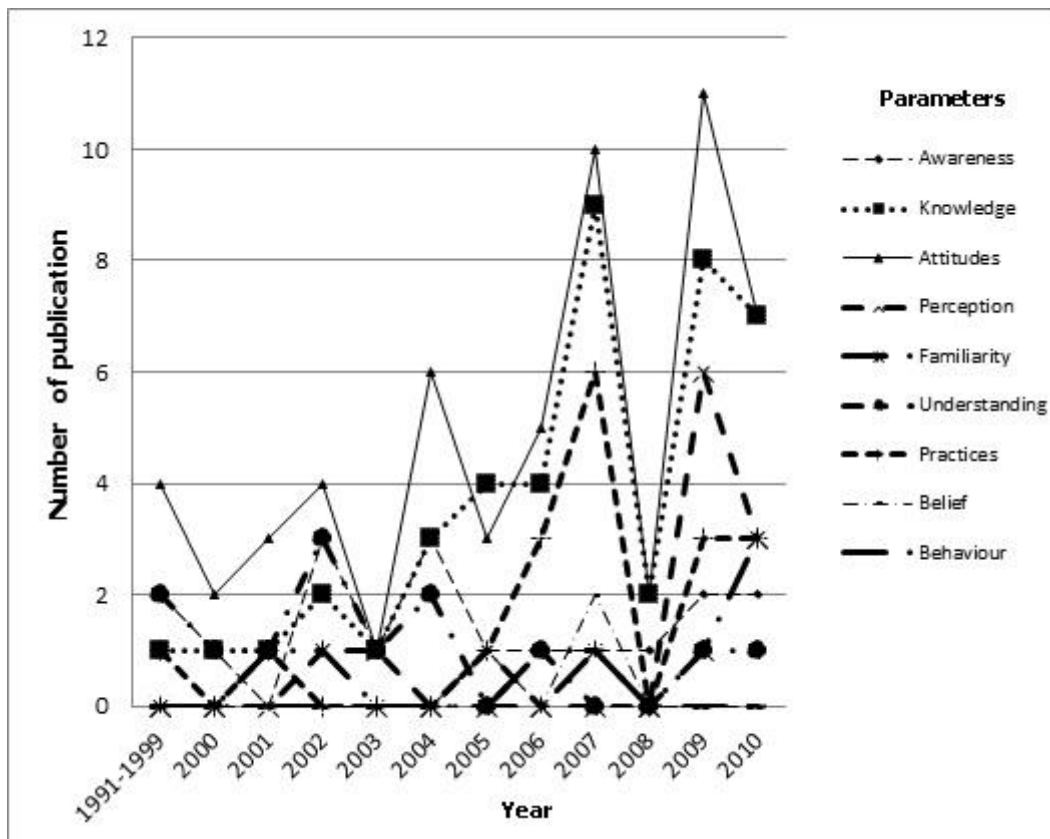


Figure 1

Trend of parameters which have been assessed in published epilepsy literature for the past decade (2000-2010).

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