Knowledge, attitudes, and practices of health sciences students regarding epilepsy at the end of their curriculum in Benin

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ABSTRACT

Objective: The main objective of this study was to evaluate the knowledge, attitudes, and practices (KAP) of health sciences students regarding epilepsy at the end of their curriculum in Benin.
Methods: We conducted a cross-sectional survey among medical, pharmacy, nursing, and midwife students in their last year of health sciences training in the University of Abomey-Calavi in Benin. Students completed a self-administered questionnaire, containing items addressing demographics, epilepsy treatment, diagnosis, clinical practice, and social tolerance regarding a person with epilepsy (PWE).
Results: The response rate to our survey was 87.7% (n = 164). The sample consisted of 64 medical students, 22 pharmacy students, 43 nursing students, and 35 midwife students. They were divided into 95 female subjects and 69 males; sex ratio was 0.7. The mean age of participants was 23.6 ± 1.8 years. The mean scores for epilepsy knowledge, practices, and attitudes were respectively 7.6 ± 1.7 out of a maximum score of 11, 3.9 ± 1.8 out of 8, and 9.6 ± 0.8 out of 10. The KAP overall score was 21.1 ± 3.4 out of a maximum score of 29.0. The variables associated with the overall KAP score were training school, gender, having heard about epilepsy before health sciences studies (p = 0.017), and having a relative with epilepsy (p = 0.001). Male students and medical school students had significantly better overall KAP score than female students or the other training schools respectively (p < 0.001).
Significance: These findings support the need to improve the health sciences students' knowledge of epilepsy, in particular, during their training.

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1. Introduction

Epilepsy is one of the most common chronic disease of the central nervous system [1]. It affects more than 70 million people worldwide; most live in low- and middle-income countries and do not receive appropriate treatment [2]. In Africa as well as other parts of the world, epilepsy continues to be perceived by many as a supernatural, contagious, and shameful disease [3–6]. This limits the search for appropriate care and contributes to a greater treatment gap in developing countries as patients are often hidden and stigmatized [3,4,7,8].

Healthcare workers including physicians, nurses, clinical officers, pharmacist… are the main stakeholders in the management of a person with epilepsy (PWE) particularly in developing countries [9,10]. It is important that they have good medical knowledge about the disease as well as be aware of its sociocultural representations in different communities [11]. However, studies on perceptions of epilepsy among healthcare workers have shown a lack of knowledge about the disease. A survey conducted among Zambian healthcare workers (nurses and clinical officers) showed that 54.8% of them think that epilepsy is due to a mental illness and 5.6% to a contagious disease [9]. In Laos, 60.4% of a total of 48 physicians in a survey believed that epilepsy could be transmitted through saliva [12]. Healthcare workers are not often socially tolerant of people with epilepsy. In the Zambian survey, 25.2% of them would oppose the marriage of their son with a PWE; 3.6% believes that a child with epilepsy should never attend school [9]. In Saudi Arabia, 67% of the 822 medical and paramedical personnel surveyed said that they would oppose the marriage of their child with a PWE [13]. The levels of education and occupation were correlated with the level of knowledge about epilepsy and with a better social tolerance of a PWE [9,13]. Healthcare workers who had completed practical internships, in addition to theoretical curriculum on epilepsy during their training, had a better understanding of the disease [9].

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Healthcare workers recognized that their knowledge about epilepsy was limited [14,15]. The barriers that limit appropriate management of a PWE, identified by healthcare workers, are the difficulties in acute management and recognition of partial epilepsy, in managing pregnant woman with epilepsy and in managing the stigma [12,16,17]. Studies conducted among healthcare workers about epilepsy do not always take into account the time elapsed since the end of training in vocational schools [13,17,18]. Thus, when the level of knowledge seems insufficient, it may be due to a lack of initial knowledge (failure in acquisition during their curriculum) or to a loss over time of knowledge initially acquired. In Cameroon, 6% of medical students considered epilepsy to be contagious, 10% of preclinical students and 3.3% of clinical students could not tell a cause of epilepsy [19]. More than 80% of first-year medical students at Mulago Hospital in Kampala said that they would not allow their children to marry a PWE. Most respondents believed that epilepsy was a mental illness, and many believed that a PWE cannot have normal intelligence [20]. These misperceptions must be identified and corrected among medical students during the training.

Epilepsy is a major public health problem in Benin as in more sub-Saharan African countries, with a nationwide representative prevalence of 08.05 [21]. Like other African countries, Benin faces a shortage of neurologist, leaving the responsibility for the care of a PWE to general practitioners, nurses, and midwives; pharmacists are also involved. Benin has three universities in which healthcare workers are trained. The University of Abomey-Calavi is the oldest and has a medical school, a faculty of pharmacy, dentistry, and a nursing and midwifery school. The University of Parakou in the north has a medical school and a training school for nurses. Finally, the University of Porto Novo, the latest, has a medical school. It takes 7 years to graduate as a Medical Doctor and 6 years as a Pharmacist. Nurses and midwives would get their professional license after 3 years of study. During their curriculum, medical students benefit from 28 h of neurology classes divided into 12 h of semiology (2nd year), 10 h of pathology (4th year), and 6 h of therapy in the 5th year. The hourly load devoted to epilepsy is 6 h (2 h per year). Apart from the therapeutic courses, pharmacists have the same neurology content as physicians but are taught in the 2nd and 3rd year. Nurses and midwives receive, in the third year, the same 8 h neurology program, including 2 h devoted to epilepsy. Each of these student categories complete hospital internships during their curriculum; completing this internship in a neurology department is a choice; some students can finish their training without setting foot in a neurology department.

Prior knowledge, attitudes, beliefs, and practice surveys conducted in Benin have been directed at the general public, students, or teachers [3,5,22–26]. There is no study, to our knowledge, that is focused on the knowledge, attitudes, and practices (KAP) of healthcare professionals, much less the health sciences students on epilepsy in Benin.

The main objective of this study was to determine the level of knowledge of health sciences students about epilepsy at the end of their curriculum in Benin.

2. Methods

We conducted between May 6th and 16th 2016 a cross-sectional survey among health sciences students in their final year of studies in Benin.

Benin is a sub-Saharan African country bounded by Burkina-Faso and Niger in the North, Togo in the West, and Nigeria in the East. The country extends from the Niger River in the North to Atlantic Ocean in the South with an area of 112,622 km². The estimation population in Benin was 11,186,785 inhabitants in 2017 [27].

2.1. Study setting

The study was conducted at the Faculté des Sciences de la Santé (FSS) and at the Institut National Médico-sanitaire (INMES), two entities of Abomey-Calavi University in Benin. The University of Abomey-

Calavi was chosen because it is the only institution that trains both students in medicine, pharmacy, nursing, and midwifery. We had ensured that they had finished the neurology program, both theoretical and internships.

After having obtained the approvals of the Dean of FSS and the Director of INMES, all students were invited (medical and pharmacy students on the one hand and nurse and midwife students on the other) to participate at a conference on research methodology and epidemiological studies. The subject of the study had not been communicated to them in advance to avoid information bias. During the conference, the KAP study was presented to the students, and their free and informed consent was requested. All students present agreed to participate in the study.

2.2. Instrument

After reviewing several knowledge, attitudes, beliefs, and practices instruments used by other groups studying epilepsy [9,12,13,22,28–30], we developed a 41-item questionnaire. The most common questions about KAP were kept, and other items related to symptoms, diagnosis, and management of epilepsy were added (Appendix A). The questionnaire was divided into two sections. The first section included sociodemographic information and general questions about epilepsy (Q1–Q14). The second part was related to KAP (Q15–Q41) and assessed the basic knowledge that any health provider should have about epilepsy. This part could be subdivided into three areas (KAP). "Knowledge" questions were related to epilepsy diagnosis; the "Practices" chapter was related to epilepsy clinical management, and "Attitudes" questions were related to social tolerance regarding a PWE.

There were three different types of questions based on the responses that were possible. The first group was closed questions leaving only the choices of yes or no, true or false, and I don't know. The second type was multiple-choice questions (several qualitative answers were proposed) and recognition responses. The last one collected opinions of the professionals on the different attitudes towards the stigma on epilepsy. The choices of answers were the following: Strongly disagree, Disagree, Agree, and Totally agree.

To facilitate comparison between groups, we developed three scores: "Knowledge score" (Q12–Q22), "Practice score" (Q23–Q30), and "Attitude score" (Q31–Q40). The subquestions were not taken into account in calculating the different scores since they provided additional information regarding the questions that preceded them. The various response options for each question were reduced to a dichotomous alternative, "Yes"/"No" for the rating. The answers "False" and "I don't know" were deemed equivalent to "No" and "True" to "Yes". A correct answer to a multiple-choice question became a "Yes", an incorrect answer or the choice of both correct and incorrect answers to the same question became a "No". For questions on opinions, "Agree" or "Strongly agree" was deemed equivalent to "Yes" and "disagree" or "totally disagree" to "No". Correct answers were rated 1 and incorrect answers 0. The score for each domain was the sum of all the individual scores for each question in that specific domain. Thus, the scores ranged from 0 to 11, 0 to 8, and 0 to 10 respectively for the knowledge, practice, and attitude of healthcare professionals regarding epilepsy. The overall KAP score, which is the sum of the three domain scores, ranged from 0 to 29. To help with the interpretation of the results, the overall KAP score has been transformed into several categories. They consisted in 7 classes [31]: Excellent (26–29), Very good (23–25), Good (20–22), Fairly good (17–19), Fair (15–16), Low (12–14), and Nil (0–11). The Excellent range was considered as the reference level of knowledge.

Question 41 was about the students' own judgment about their epilepsy knowledge. The different options in terms of responses were Good, Acceptable, and Limited.

The questionnaire was pretested on a pilot group of fourth-year medicine students for accuracy and comprehension. This allowed the wording of some of the questions to be adjusted to be better understood

by students. The minimum time to complete the questionnaire was 9 min, and the maximum was 25 min.

The questionnaire was administered in the form of a self-administered questionnaire. Questionnaires were completed anonymously under the supervision of investigators so that students will work together to answer.

2.3. Statistical analysis

Data analysis was performed using Epi Info 3.5.4. Descriptive variables were expressed as mean, standard deviation, or percentage. The scores were analyzed as continuous variables. A univariate analysis using Kruskal–Wallis test was used to compare the different scores. A p-value of less than 5% was considered statistically significant.

3. Results

3.1. Demographic characteristics and experience with epilepsy

There was a total of 187 health sciences students at the end of their curriculum at the University of Abomey-Calavi, including 76 medical students, 26 pharmacy students, 46 nursing, and 39 midwife students. One hundred and sixty-four (164) subjects participated in the study, representing an overall participation rate of 87.7%. They consisted of 64 medical students, 22 pharmacy students, 43 nursing students, and 35 midwife students. They were divided into 95 female subjects and 69 males; the sex ratio was 0.7. The overall average age was 23.6 ± 1.8 years. The most represented age range was 25–29 years old (69.5%) (Fig. 1). The male subject's average age was 24.03 ± 1.9 and 23.24 ± 1.6 for the female.

Out of the total number of survey participants, 67.7% had witnessed at least one epileptic seizure while 14% had a close family member/friend with epilepsy. Table 1 shows demographics characteristics of the survey participants.

3.2. Health sciences students' knowledge about epilepsy

The average knowledge score was 7.6 and ranged from 3 to 11 (standard deviation: 1.7, median: 8). The different responses to questions on knowledge are reported in Table 2. Epilepsy was recognized as a neurological disease by almost all subjects (99.4%). On the other hand, its definition as the occurrence of at least two epileptic seizures, unrelated to a particular situation, was known only by half of the subjects. About 30% believed that epilepsy was always hereditary, and 6.7% thought (midwives mainly) that it was contagious. All subjects knew that epilepsy was not due to divine punishment nor to a curse or to witchcraft.
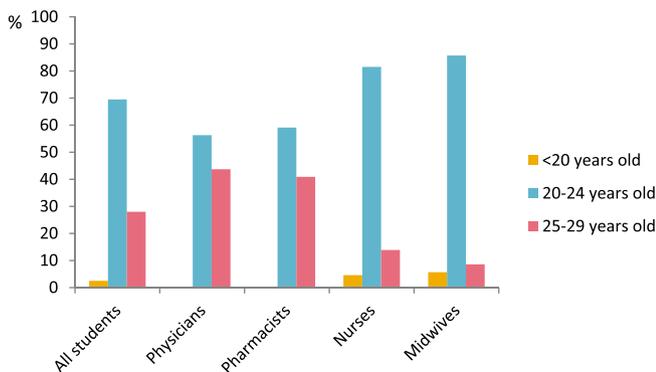

Fig. 1. Distribution of health sciences students by age range.

Table 1
Demographic characteristics and experience with epilepsy of health sciences students.

	Medicals n = 64	Pharmacy n = 22	Nursing n = 43	Midwifery n = 35
Age				
Mean	24.6	24.2	22.7	22.5
Standard deviation	1.22	0.80	2.04	1.75
Range	23–27	23–25	18–29	19–26
Mode	24	25	23	23
Gender				
Female n (%)	30(46.9)	11(50.0)	19 (44.2)	100.0
Male n (%)	34(53.1)	11(50.0)	24 (55.8)	00(00)
Type of neurology training received				
Theoretical class/lecture (%)	82.8	100.0	68.3	66.7
Theoretical class + Internship (%)	17.2	0.0	31.7	33.3
Having witnessed an epileptic seizure (%)	70.3	22.7	83.7	22.7
Having a close family member/friend with epilepsy (%)	20.3	0.0	14.0	11.4

3.3. Attitudes of health sciences students regarding a PWE

Health sciences students as a whole were quite supportive of people with epilepsy. All of them stated that children with epilepsy should be educated in the same way as other children and in the same institutions. However, 3.1% of medical students, 13.0% of pharmacy students, 44.2% of nursing students, and 40.0% of midwifery students were unfavorable to physical and sports activities for a PWE. About 4.7% of nursing students and 8.6% of midwifery students suggested that parents should forbid their child from playing with a PWE. All survey participants were of the opinion that a PWE could have a child and that parents should not oppose the marriage of their child with a PWE, except for 11.4% of midwifery students who stated that parents should discourage their child from marrying a PWE. In the workplace, 4.7% of nursing students, 3.1% of medical students, and 2.9% of midwifery students were not in favor

Table 2
Knowledge of health sciences students about epilepsy.

	Medicals n = 64	Pharmacy n = 22	Nursing n = 43	Midwifery n = 35
At what age can epilepsy occur?				
Any age %	96.9	72.7	93.0	77.1
What can cause epilepsy?				
Disorder of the central nervous system %	100.0	100.0	93.0	100
A psychiatric disorder %	6.3	0.0	20.9	22.9
All children born to parents with epilepsy will develop epilepsy				
True %	4.7	31.8	11.9	42.9
An individual who has sustained a head injury has a higher risk of developing epilepsy in the future				
True %	81.3	45.5	69.8	20
Epilepsy always manifests as seizures				
True %	34.4	81.8	60.5	82.9
All seizures equal epilepsy				
False %	100.0	86.4	100.0	100.0
Type of seizures/signs may be found during an epileptic seizure				
Generalized seizure (%)	92.2	100	72.1	62.9
Partial seizure (%)	65.6	0.0	32.6	14.3
Absence seizure (%)	56.3	18.2	44.2	11.4
Hallucinations (%)	10.9	0.0	2.3	11.4
Grinding of the teeth (%)	64.1	0.0	44.2	25.7
Rolling of the eyes (%)	70.3	18.2	51.2	48.6
Generalized loss of body tone (%)	56.3	40.9	41.9	28.6
Knowledge score (mean, standard deviation)	8.7 (1.3)	7.2 (1.4)	7.6 (1.3)	5.7 (1.5)

of a PWE sharing the same workspace as healthy subjects. A small number of nursing and midwifery students were of the opinion that public places should be prohibited to a PWE (2.3 and 5.7%, respectively).

The average score on attitudes was 9.6 with a range of 9 to 10. All categories had a score greater than 9.

3.4. Practices of health sciences students regarding a PWE

In response to what should be done when witnessing someone having a generalized tonic–clonic seizure, 4.7% of medical students, 4.7% of nursing students, and 25.7% of midwifery students recommended to prevent the convulsion by overpowering the individual through force. Introduction of an object into the person's mouth to prevent tongue biting was proposed by one-third of nursing students (32.6%), one-fifth of medical students (20.3%), half of pharmacy students (59.1), and more than one in three midwifery students (65.7). Health sciences students' practices for epilepsy are presented in Table 3.

The mean score on health sciences students' Practices for Epilepsy was 3.9 ± 1.8. The median was 4, and the range was 0 to 8.

3.5. Overall KAP score of health sciences students on epilepsy and associated factors

The mean KAP score of health sciences students surveyed was 21.1 ± 3.4 out of 29. The median was 21, the lowest score was 10, and the highest was 28. None of the subjects surveyed had a total score of 29 out of 29. The mean overall KAP score for each category was 23.3 ± 2.4 for medical school students, 21.2 ± 2.6 for pharmacy students, 20.9 ± 2.4 for nursing school students, and 17.2 ± 2.9 for midwifery students. Fig. 2 shows the ranking according to the qualitative scale of the average scores of each health sciences student's category.

Overall, 11.6% of the subjects rated their overall level of knowledge on epilepsy as good, 46.3% as acceptable, and 42.1% as limited.

The variables associated with the overall KAP score were training school, gender, having heard about epilepsy before health sciences studies (p = 0.017), and having a relative with epilepsy (p = 0.001) (Table 4). Male students and medical school students had significantly better overall KAP score than female students or the other training schools respectively (p < 0.001).

A significant positive correlation was found between the level of knowledge and the level of practices (r = 0.29, P < 0.001) and with the level of attitudes (r = 0.09, p < 0.001).
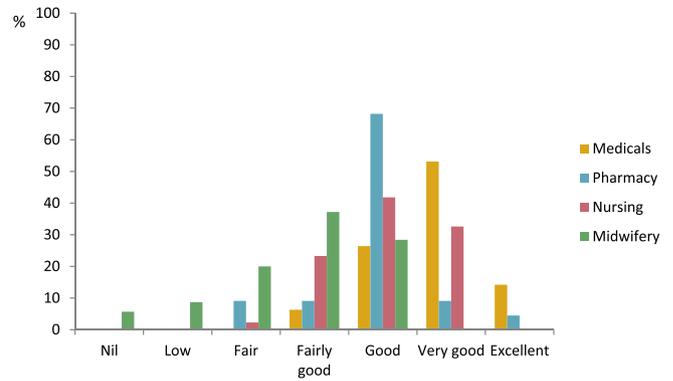

Fig. 2. Qualitative classification of KAP score averages.

4. Discussion

This study was conducted to determine the level of epilepsy knowledge of health sciences students at the end of their studies in Benin. The participation rate was 87.7%. The mean of overall KAP score was 21.1 ± 3.4 out of 29. It was considered low because a score ranging from 26 to 29 was established as the reference level of knowledge. Male students, those with a close family member or a friend with epilepsy, and medical students had a significantly better level of knowledge about epilepsy than others.

The study was conducted using a questionnaire designed after reviewing in literature several knowledge, attitudes, beliefs, and practices instruments used by other groups studying epilepsy. A composite score has been created to allow comparison between groups. Pretesting ensured that the different questions were understood by the students. The filling of the questionnaire in the presence of the investigator ensured the individuality of the answers. Moreover, the students had only been informed about the study during the working session; this eliminates potential information bias. The participation rate of about 90% ensures a good representation of our sample.

Despite these strengths, our study has some shortcomings. Indeed, while this is obvious, it will be difficult for us to make a pronouncement about the actual contribution of medical studies to students' knowledge because of the study design. A comparative study with other students at the end of a nonmedical course or a quasi-experimental study type

Table 3
Practices of health sciences students regarding person with epilepsy.

	Medicals n = 64	Pharmacy n = 22	Nursing n = 43	Midwifery n = 35
What should you do when faced with a generalized tonic–clonic seizure?	4.7	0.0	4.7	25.7
- Stop the seizure by overpowering the individual through force (%)	20.3	59.1	32.6	65.7
- Place an object in the individual's mouth to prevent the jaws from closing (%)	90.6	63.6	95.3	68.6
- Protect the individual by moving them away from dangerous objects (%)	18.8	9.1	7.0	0.0
- Administer anticonvulsants via the mouth (%)	81.3	40.9	88.4	65.7
- Comfort the individual until the seizure is over (%)	4.7	0.0	4.7	25.7
Epilepsy can be treated				
True (%)	100.0	81.8	79.1	71.4
An individual with epilepsy can be permanently cured of the disorder				
True %	23.4	27.3	14.0	11.4
Pharmaceutical antiepileptic treatment continues throughout the individual's life				
True %	45.3	45.5	74.4	37.1
The individual can stop taking the antiepileptic drugs as soon as the seizures stop				
True %	15.6	22.7	18.6	0.0
Individuals with epilepsy must adhere to a certain number of dietary restrictions				
True %	0.0	0.0	16.3	37.1
Which of the following situations are not advisable for individuals with uncontrolled epilepsy?				
Teaching	14.1	9.1	46.5	25.7
Working at height	95.3	100.0	86.0	68.6
Driving	89.1	100.0	88.4	85.7
Practice score (mean, standard deviation)	4.7 (1.6)	4.1 (1.6)	3.9 (1.4)	2.3 (1.4)

Table 4
Variables associated with the overall level of knowledge about epilepsy.

	Number (%)	Overall KAP score	p value
Training school			<**0.001**
Medical	64 (39.0)	23.3	
Pharmacy	22 (13.4)	21.1	
Nursing	43 (26.2)	21.0	
Midwifery	35 (21.3)	17.2	
Age			0.187
<20	04 (2.4)	18.5	
20–24	114 (69.5)	21.1	
25–29	46 (28)	21.3	
Gender			<**0.001**
Male	69 (42.1)	22.3	
Female	95 (57.9)	20.2	
Having heard about epilepsy			**0.017**
Yes	152 (92.7)	21.3	
No	12 (7.3)	19.0	
Type of neurology training received			0.780
Theoretical class	111 (79.9)	21.7	
Theoretical class + Internship	28 (20.1)	21.8	
Having witnessed an epileptic seizure			0.795
Yes	111 (67.7)	21.1	
No	53 (32.3)	21.0	
How a seizure had been witnessed?			0.056
Live	98 (88.3)	21.0	
Watching in a movie	13 (11.7)	22.8	
Having a close family member/relative			**0.001**
Yes	23 (14.0)	22.6	
No	119(72.6)	21.2	
Don't know	22 (13.4)	19.0	

The bold values represent the p-value of the variables associated significantly with the overall level of knowledge.

before/after would have been more appropriate. Also, for more reliability of our collection tool, it would have been interesting to precede our study with a questionnaire validation survey.

The subjects had witnessed an epileptic seizure in 67.7% of the cases. This value is significantly lower than the 80.7% reported by Njamnshi et al. in medical students in Cameroon [19]. This proportion exceeds ours because recruitment was done on a larger population (students of the fourth in the seventh year of medicine). Moreover, the low rate obtained by students in pharmacy and midwifery, who do not attend many cases of seizures because of their work, has influenced our proportion (Table 1). Our value is also significantly lower than the 98.2% of controls in the survey of healthcare workers in Zambia [9]. The difference could be explained by the fact that Zambians were already practicing healthcare providers and, as a result, had more experience with epilepsy.

The notion that epilepsy is a neurological disease was confirmed by almost all of the subjects surveyed. Health sciences' training has certainly helped to remove the sociocultural representations which attribute a supernatural origin to the disease or which links it to uncleanliness [3]. The majority (89.9%) of Cameroon health sciences students recognized that epilepsy is caused by a brain disorder. However, some health sciences students like the first-year medical students at Mulago Hospital in Kampala thought that epilepsy is a mental retardation (10%) or a spirit possession (5%) [20]. These findings show that students at the beginning of medical training have less knowledge about epilepsy than their seniors [32,33]. In a study conducted in India among students who were not studying health sciences, 59.3% claimed that epilepsy was due to mental retardation [34]. These results also confirm the contribution of health sciences training to the understanding of epilepsy. However, in some cases, there can also be misconceptions about epilepsy among health sciences students. Our study showed that 6.7% of students mainly midwives believed that epilepsy is contagious. In Cameroon, only 0.7% of medical students said it was contagious [19]. In Laos, 33.3% of physicians thought it was a communicable disease [12]. This means that even in the healthcare workers already operating, gaps about epilepsy knowledge exist. Belief in the contagiousness of

epilepsy through direct contact with the PWE or with their body fluids (saliva, urine, tears in this study) can exacerbate attitudes of fear and rejection. Epilepsy was seen as a hereditary disease by 28.7% of the subjects surveyed. This rate is lower than the 40.3% found in a study of medical students at the University of Manipal in India [29]. This difference is understandable since the population of the Indian study consisted of students in their first year at medical school.

The subjects in our study had a fairly good social tolerance towards a PWE. None of the medical students stated that they would object to their child marrying a PWE or that they would prevent children with epilepsy from going to the same schools as other children, contrary to the opinion of first-year medical students at Mulago Hospital in Kampala who would not allow their child to marry someone with epilepsy [20]. Physicians in Laos would oppose to the marriage of their children with a PWE (70.8%), and 24.3% would not allow their children going to the same school as children with epilepsy [12].

As in the case with the general population, generalized tonic–clonic seizure was easily recognized by healthcare professionals at the end of their studies. In our study, only 37.2% of the subjects (all categories combined) were able to identify partial epilepsies. This result is higher than the 20% obtained by already practicing medical staff in the Zambian study [9]. The practice of health sciences students when faced with an epileptic seizure is not without consequence since some actions to avoid were found in the various responses obtained in this study. For example, preventing seizures by controlling the patient by force or giving medication by mouth are attitudes that should be avoided; fractures, dislocations, or choking could occur.

Epilepsy can be treated. Our study showed that 25% of nursing students, 25% of pharmacy students, and 20% of midwifery students thought the opposite. The treatment of epilepsy is not always lifelong. Indeed, stopping antiepileptic drugs (AED) could be considered for a treated PWE after two to five years without seizure. Under these conditions, the AED dosage would be gradually reduced until complete discontinuation of the drug. Some of the nurses and midwives in our study believed that a PWE had to follow dietary restrictions. This notion is often found in popular beliefs, especially in sub-Saharan Africa, where the consumption of these foods would increase the foam ("drool") that flows from the mouth of the subject during a seizure [35]. Bamileke traditional healers in Cameroon and Akan traditional healers in Ivory Coast banned all meat consumption during the treatment of epilepsy [35,36]. They did not necessarily make the link between meat consumption and the occurrence of seizures, but they thought that undercooked meat could be the cause of some diseases, without necessarily thinking about epilepsy.

Overall, our study showed that medical students have a better level of knowledge than the rest of the health sciences students. This result confirms what is found in the literature [28]. Such a result is hardly surprising since, of the four professional categories, medical students benefit from more hours of epilepsy training and do more internship in different hospital departments during their university curriculum. It could also be that the content of the training for medical students is different from that of pharmacy students, even if it is on the same topic. Since medical students will be prescribers, teachers will tend to emphasize what would promote a good understanding of the disease, its diagnosis, and its management. Although this difference is not statistically significant in our study, health sciences students who have done internships in a hospital department, in addition to lectures on epilepsy, have a better overall knowledge of the disease. This result reflects the importance of traineeship in hospital settings as part of the training of health sciences students. None of the subjects surveyed were able to correctly answer all of the questions included in the KAP questionnaire, and very few had an excellent level of epilepsy knowledge. These results reflect a relatively low level of knowledge for health sciences students about epilepsy at the end of their curriculum in Benin. The KAP questionnaire, however, included basic questions about epilepsy for which all students should get all the correct answers. Most of these students were aware of their level of knowledge about the disease. Others, who described their

knowledge as good or acceptable when in fact it was not, represent a potential danger to patients.

5. Conclusion

It appears from this study that the overall level of knowledge about epilepsy among health sciences students at the end of their curriculum in Benin, whatever the category, is relatively low. These future healthcare workers will certainly be confronted, on the ground, with the difficulties of taking care of a PWE. Actions to improve knowledge and attitudes of health sciences students could improve future management of patients with epilepsy.

Acknowledgments

Conflict of interest statement

- Charlemagne Vodougnon was an intern at Sanofi for 6 months during which he received a grant.
- Pierre Emile Bruand is a Sanofi employee and owns Sanofi stocks.
- Daniel Gerard is a former employee of Sanofi.
- Other authors do not have any conflict of interest to disclose.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.yebeh.2018.12.020.

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