Original Article

A Survey on Awareness, Knowledge, and Attitudes toward Epilepsy in an Urban Community in Turkey

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Abstract

Background and Aim: Epilepsy is one of the most common chronic neurological disorders with a high prevalence. Epileptic people and their family members suffer more from social stigma than the disorder itself. Among various complex reasons knowledge and awareness about epilepsy are the two important factors underlying discriminatory attitudes towards epileptic people. Community pharmacists play a major role in the care of these patients. In this study we mainly aimed to gain insights into the knowledge and awareness of and attitudes (AKA) towards epilepsy both in epileptic and healthy individuals in an urban community. To this end we also aimed at developing a reliable and valid measurement tool to assess AKA levels. **Materials and Methods:** This study was conducted in 13 community pharmacies with 219 respondents. Factor analysis yielded three clear subscales. **Results:** It was found that a vast majority of the participants were familiar with epilepsy; yet only 18 of them had detailed information. The community pharmacists were indicated as a main source of information about epilepsy at the same rate to that of physicians. Although most of the respondents knew that epilepsy was not a form of mental illness only about one forth of them knew the real cause. More than half of the respondents supported the epileptics' socialization in the community. **Conclusion:** We believe that the questionnaire developed in the study is a promising instrument for determining educational needs and offering guidance to healthcare professionals in developing standardized educational tools and programs.

Keywords: *Attitude, awareness, community pharmacist, epilepsy, knowledge*

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Introduction

Epilepsy is one of the most common chronic neurological disorders characterized by recurrent unpredictable seizures resulting from sudden excessive electrical discharges in the brain cells.[1] Despite significant improvements in health-care services and advances in the diagnosis and therapy of epilepsy, it affects approximately 50 million people worldwide.[2] Its prevalence is reported to be 20–50/100,000 and the incidence is 4–10/1000.[2] The prevalence of epilepsy in Turkey is reported to be 6.1–10.2/1000.[3]

Along with a range of coexisting conditions they undergo, a majority of people with epilepsy face challenges in the society they live in. Most of them are restrained from leading an active social life and experience social discrimination and exclusion.[4] Epileptic people and their family members suffer more from social stigma than the disorder itself.[5] Among various complex reasons in different communities, having little knowledge about epilepsy has been reported to be an important factor underlying discriminatory attitudes toward epileptic people.[6] On the other hand, level of education has been found to positively correlate with awareness, knowledge, and attitude (AKA) about epilepsy.[7]

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Community pharmacists play a major role in the care of patients with epilepsy. The community pharmacists not only provide information to patients that help them understand their conditions and manage the treatment by giving self-care advice, but also educate patients and their families regarding the improvement of adherence to antiepileptic drug therapy. While doing so, in order to achieve positive patient outcomes, community pharmacists must be aware of the needs of people with epilepsy since traditional beliefs, religion, and socioeconomic status play an important role in shaping perspectives to epilepsy in the community.[4] However, detailed information regarding the level of knowledge and awareness about epilepsy and attitudes toward illness must be obtained to determine the needs of the target group and to develop educational resources and tools for community pharmacists.

Prescribing and understanding the goals is vital for the development of standardized education tools. It is only possible to set the goals correctly if reliable data are obtained from the correct measurement tool.[8] In literature, there are a number of studies on AKA about epilepsy among urban and rural communities. Data sources in these previous studies involve self-report questionnaires administered to patients and/or participants. Such self-report measures may pose danger of subjectivity in judgment if content and construct validity studies are not performed. For this reason, this study has two main goals. In the study, we mainly aimed to gain insights into the AKA toward epilepsy both in epileptic and healthy individuals in an urban community. To this end, we also aimed at developing a reliable and valid measurement tool to assess AKA levels.

Materials and Methods

Populations and study design

This cross-sectional comparative descriptive study was carried out in community pharmacies in Atasehir-Istanbul over a 6-month period. A total of twenty community pharmacies were invited to participate in the study, 13 of which agreed to participate. Each pharmacy, in accordance with the pharmacy laws of Turkish Republic (law number 6197), serves per 2500 populations, which means that the entire population is 50,000.

Inclusion criteria for the respondents were[1] any volunteer aged ≥15 years old and who came to the community pharmacies to take their medications;[2] able to understand, read, speak, or write Turkish; and[3] capable of answering the questions either in written form or by interview.

Data collection tool and procedure

Data in this study were collected through a questionnaire developed by the researchers. The questionnaire consists of 28 semi-structured questions. The questionnaire comprises of three sections: (1) demographic information, (2) information on epilepsy, and (3) AKA sections. Demographic information inquires about pertinent responder characteristics such as age and gender and information on epilepsy inquires about epileptic participants' level of knowledge regarding specific aspects of the treatment, which are detrimental for the adherence/success of antiepileptic therapy. In this section, participants with epilepsy are asked to identify if their seizures were under control, their tendency of drug use, adherence to dosing regimen of antiepileptic drugs, drinking behaviors, and sleep patterns. The AKA section consists of 18 questions asking participants their awareness, attitudes, and knowledge of epilepsy. In this section, the distribution of questions are as follows: two questions are on awareness about epilepsy, five questions are about attitudes toward epilepsy, and 11 questions are about knowledge of epilepsy.

As of data collection procedure, at the first meeting, the researcher or the trained research assistant explained the study and invited the community pharmacists to accept to conduct the study in their pharmacies. Potential respondents were defined as local customers within the selected pharmacies who met all the inclusion criteria.

In order to enhance their understanding about the study, the respondents were distributed an information sheet with which they could clarify their consent and learn about instruments used and the study requirements. Those agreeing to participate proceeded to complete the questionnaire. Prior to commencement, the researchers obtained ethical committee approval from Yeditepe University Ethical Committee.

Validity of the questionnaire

Content validity

As a first step, a neurologist designed a preliminary questionnaire by taking the Turkish version of the Quality of Life in Epilepsy Inventory-31 as a model.[9] Later, a panel of three independent neurologists affiliated with the Medical Faculty, Department of Neurology, Yeditepe University, was consulted to assess the content validity of the questionnaire. The questionnaire items were revised in accordance with the feedback from these specialists. Then, the questionnaire was administered to 10 patients and 23 relatives from the Epilepsy Outpatient Clinic at the University Hospital of Yeditepe in order to check the items in terms of language and understandability.

Construct validity

The construct validity of the questionnaire was assessed by factor analysis.[10] An item-total correlation test was performed to check if all items correlate with the total.

A Kolmogorov–Smirnov test was used to test for normality on the variable. Suitability of data for factor analysis was assessed by Kaiser–Meyer–Olkin (KMO) and Bartlett sphericity tests.[11,12] Factor analysis was done through principal component analysis (PCA) method together with Varimax with Kaiser Normalization Rotation.[13] Factors whose eigenvalues are above 1 were extracted. Factor loadings >0.40 were considered important, while loadings 0.50 or greater were considered significant.[14]

Instrument

The instrument used was the modified AKA epilepsy used by Neni *et al*.[1] This instrument contained three domains: awareness, knowledge, and attitudes. Each response score ranges from 0 to 2 (yes = 2, no = 1, and no idea score = 0). The first domain was to detect awareness level which contained two items with total score ranging from 0 to 4 and interpreted as: 0–0.6 = low, 0.7–1.3 = moderate, and 1.4–2.0 = high. The second domain was to determine knowledge level which contained 11 items with total score ranging from 0 to 22. Score interpretation of knowledge level is as follows: 0–0.6 = low, 0.7–1.3 = moderate, and 1.4–2.0 = high. The last domain measured attitude level, which was sampled by 5 items with, total score ranging from 0 to 10 and interpreted as: 0–0.6 = negative, 0.7–1.3 = indifferent, and 1.4–2.0 = positive. Finally, the total AKA score was generated through the summation of all the three-domain scores to give the general AKA level of all respondents. For the total AKA level, the score ranges from 0 to 36 with score interpretation of total AKA level as follows: 0–0.6 = poor, 0. 7–1.3 = moderate, and 1.4–2.0 = good.

Statistical analysis

Data were analyzed using SPSS version 21 (IBM, USA). All sociodemographic data were analyzed descriptively and presented as frequencies and percentages. Wherever relevant, Chi-square test for goodness of fit was used for the analysis of single categorical variable. Test of normality was employed for testing data distribution of the variables. General AKA level was initially presented descriptively in the form of mean and standard deviation. Independent *t*-test was utilized to test for group score comparisons for AKA level based on sociodemographic variables.

Results

Sociodemographic information

This study was conducted in 13 community pharmacies with 219 respondents. The mean age was 41.6 ± 13.0 years, ranging from 15 to 84 years. The male-to-female ratio was 1.26:1.00. Most of the respondents were nonepileptic (78.5%) and had university education (60.7%). Further details are summarized in Table 1.

Table 1: Sociodemographic characteristics of respondents

Sociodemographic characteristics	Total number of participants (*n*1=219), frequency (%)	Participants with epilepsy (*n*2=47), frequency (%)
Sex		
Male	122 (55.7)	30 (63.8)
Female	97 (44.3)	17 (36.2)
Age (years)		
15-24	28 (12.8)	16 (34.0)
25-39	84 (38.4)	13 (27.7)
40-54	62 (28.3)	10 (21.3)
55-69	36 (16.4)	5 (10.6)
70-84	9 (4.1)	3 (6.4)
Education level		
Primary	11 (5.0)	3 (6.4)
Intermediate	68 (31.1)	7 (14.9)
University	133 (60.7)	36 (76.6)
Master/doctorate	7 (3.2)	1 (2.1)
Marital status		
Single	45 (20.5)	20 (42.6)
Married	142 (64.8)	22 (46.8)
Widowed	32 (14.6)	5 (10.6)
Occupation		
Student	29 (13.2)	10 (21.3)
Homemaker	16 (7.3)	3 (6.4)
Retiree	20 (9.1)	4 (8.5)
Self-employed	19 (8.7)	2 (4.3)
Professional	132 (60.3)	27 (57.4)
Unemployed	3 (1.4)	1 (2.1)

Validity of the questionnaire

The results of Kolmogorov–Smirnov test were interpreted according to Tabachnick and Fidell.[15] The value calculated for the KMO test was found as 0.894. Bartlett's test of sphericity was 1471.005 (associated with $P = 0.00$). These values indicated that data were suitable for PCA method. The loading values and factors are summarized in Table 2. As shown in the table, factor analysis yielded three clear subscales, which explained the 63.2% of the variance (awareness explained the 5.02% of variance, knowledge explained the 42.3% of variance, and attitudes explained the 15.8% of variance). The analysis provided evidence on the construct validity of the questionnaire.

Epileptic information

Forty-seven out of the 219 responders were epileptic (21.5%). The mean age was 36.7 ± 8.2 years, ranging from 19 to 65 years. The male-to-female ratio was 1.76:1.00. Majority of epileptic respondents (n = 34, 72.3%) claimed their seizures were under control. The characteristics of epileptic respondents are summarized in Table 1.

Table 2: Factor loadings and validity of the questionnaire

Item number	Pattern matrix	Factors		
		Factor 1	Factor 2	Factor 3
1	Have you ever attended a course lecture or seminar on epilepsy?	0.983		
2	Have you ever read or heard about epilepsy	0.807		
3	Do you know the cause of epilepsy?		0.798	
4	Do you think epilepsy is a form of mental illness?		0.563	
5	Do you think epilepsy can cause mental retardation?		0.648	
6	Do you think epilepsy is hereditary?		0.521	
7	Do you think epilepsy can be cured?		0.578	
8	Do you think epilepsy is contagious?		0.584	
9	Do you think epilepsy can cause psychological problem?		0.819	
10	Do you think epilepsy can be shown at any age?		0.611	
11	Do you think women with epilepsy can become pregnant?		0.465	
12	Do you think women with epilepsy can give birth through normal delivery?		0.549	
13	Do you think women with epilepsy have a healthy baby?		0.703	
14	Do you think people with epilepsy do sports?			0.584
15	Do you think there is any restriction to epileptic person to take a driving license and to drive a car?			0.578
16	Do you think men with epilepsy can do military service?			0.648
17	Do you think people with epilepsy should marry?			0.875
18	Do you think epilepsy can affect the social life?			0.549

Table 3: Knowledge of epileptics regarding the key components of antiepileptic therapy

Questions	Yes, frequency (%)	No, frequency (%)	No idea, frequency (%)
Do you think your seizure is under control?	34 (72.3)	13 (27.7)	-
Do you think the timing of the antiepileptic drug is important?	39 (82.9)	5 (10.6)	3 (6.4)
Do you know the drugs that affect the frequency of seizures?	2 (4.25)	26 (55.3)	17 (36.2)
Do you think there is a relationship between sleep pattern and epilepsy?	28 (59.6)	9 (19.0)	10 (21.4)
Do you think epileptics can drink fizzy drinks and caffeine containing beverages?	11 (23.4)	16 (34.0)	20 (42.6)
Do you think there is a restriction on alcohol consumption for epileptics?	37 (80.0)	3 (6.3)	7 (14.9)
Do you think there is a restriction on smoking for epileptics?	20 (42.5)	18 (38.3)	8 (17.0)

Table 4: Overall awareness, knowledge, attitudes and total awareness, knowledge, and attitude level

Domain	Mean±SD	Interpretation
Awareness	1.49±0.22	High
Knowledge	1.18±0.37	Moderate
Attitudes	1.43±0.52	Positive
Total AKA	1.38±0.38	Moderate

AKA=Awareness, knowledge, and attitude; SD=Standard deviation

Almost 85% (84.9%) of the epileptic respondents expressed the importance of adherence to drug regimen in antiepileptic drugs.

Majority of the epileptic responders (n = 35; 74.4%) had tendency to use flu and cold remedies. Half of the epileptic respondents (50.6%) declared using antibiotics as well. More than half of these responders (60.0%) declared concomitant use of antibiotics with flu and cold remedies. Across all epileptic respondents, 55.3% did not know drugs that affect the frequency of seizures.

More than half of the epileptic respondents (59.6%) believed that there was a relationship between sleep pattern and epilepsy; however, nearly one-fifth of them (21.4%) had no idea.

Regarding drinking behavior, almost half of the epileptic respondents (42.6%) had no idea about the potential effect of consumption of fizzy drinks and caffeine containing beverages in epilepsy. Although 80% of them believed that there was restriction on alcohol consumption, only 38.3% thought there was a restriction on smoking.

Table 5: Awareness regarding epilepsy (*n*=219)

Questions	Epileptics, frequency (%)			Nonepileptics, frequency (%)			*P*
	Yes	No	No idea	Yes	No	No idea	
Have you ever attended a course lecture or seminar on epilepsy?	-	47 (100)	-	18 (10.5)	154 (89.5)	-	-
Have you ever read or heard about epilepsy?	47 (100)	-	-	146 (84.9)	26 (15.1)	-	-
Main source of information about the illness (%)							
Television		13.0			14.0		>0.05
Internet		31.0			35.0		
Neighbor		29.0			31.0		
Health-care professionals		27.0			20.0		

Table 6: Knowledge regarding epilepsy (*n*=219)

Questions	Epileptics, frequency (%)			Nonepileptics, frequency (%)		
	Yes	No	No idea	Yes	No	No idea
Do you know the cause of epilepsy?	47 (100.0)	-	-	23 (10.5)	52 (23.7)	97 (44.3)
Do you think epilepsy is a form of mental illness?	-	46 (21.0)	1 (0.46)	-	129 (58.9)	43 (19.6)
Do you think epilepsy can cause mental retardation?	3 (6.4)	32 (68.1)	12 (25.5)	2 (1.2)	134 (77.9)	36 (20.9)
Do you think epilepsy can cause psychological problems?	35 (74.5)	9 (19.1)	3 (6.4)	92 (53.9)	51 (29.7)	28 (16.4)
Do you think epilepsy is hereditary?	21 (44.7)	6 (12.8)	20 (42.6)	154 (89.6)	10 (5.81)	8 (4.65)
Do you think epilepsy can be cured?	2 (4.26)	40 (85.1)	5 (10.6)	17 (9.8)	88 (51.2)	67 (38.9)
Do you think epilepsy is contagious?	-	47 (100.0)	-	9 (5.2)	158 (91.8)	5 (2.91)
Do you think epilepsy can affect anyone, at any age?	2 (4.3)	42 (89.4)	3 (6.38)	2 (1.1)	156 (90.7)	14 (8.2)
Do you think women with epilepsy can become pregnant?	9 (19.1)	16 (34.0)	22 (46.8)	32 (18.6)	99 (57.6)	41 (23.8)
Do you think women with epilepsy can give birth through normal delivery?	15 (31.9)	8 (17.0)	24 (51.1)	69 (40.1)	54 (31.4)	49 (28.5)
Do you think women with epilepsy have a healthy baby?	6 (12.7)	20 (42.6)	21 (44.7)	135 (78.5)	18 (10.5)	9 (5.2)

Table 7: Attitudes toward epilepsy (*n*=219)

Questions	Epileptics, frequency (%)			Nonepileptics, frequency (%)		
	Yes	No	No idea	Yes	No	No idea
Do you think people with epilepsy do sports?	47 (100.0)	-	-	150 (87.2)	19 (11.0)	3 (1.74)
Do you think there is any restriction to epileptic person to take a driving license and to drive a car?	11 (23.4)	33 (70.2)	3 (6.4)	108 (62.8)	47 (27.3)	17 (9.9)
Do you think men with epilepsy can do military service?	35 (74.5)	10 (21.3)	2 (4.3)	6 (3.5)	144 (83.7)	22 (12.8)
Do you think people with epilepsy should marry?	43 (91.5)	-	4 (8.5)	75 (43.6)	47 (27.3)	50 (29.0)
Do you think epilepsy can affect the social life?	35 (74.5)	9 (19.1)	3 (6.4)	83 (48.3)	56 (32.6)	33 (19.2)

Table 8: Awareness, knowledge, and attitude levels and total awareness, knowledge, and attitude levels of epileptic and nonepileptic respondents

Domain	Epileptics (*n*=47)		Nonepileptics (*n*=219)		*P*
	Mean±SD	Interpretation	Mean±SD	Interpretation	
Awareness	1.50±0.02	High	1.48±0.25	High	0.47
Knowledge	1.30±0.19	Moderate	1.11±0.44	Moderate	0.02
Attitude	1.68±0.39	Positive	1.37±0.53	Indifferent	0.00
Total AKA	1.44±0.77	Good	1.24±0.40	Moderate	0.03

AKA=Awareness, knowledge, and attitude; SD=Standard deviation

Knowledge of epileptics regarding the key components of antiepileptic therapy is summarized in Table 3.

Awareness, knowledge, and attitude levels

General awareness, knowledge, and attitude levels

Overall, AKA level of our population was in the moderate category (mean = 1.38 ± 0.38). Among the three domains, awareness (1.49 ± 0.22) emerged with the highest mean, followed by attitude (1.43 ± 0.52) and finally knowledge (1.18 ± 0.37). Based on the mean score of each domain, we can conclude that our population had a high level of awareness, a moderate

level of knowledge, and they showed positive attitude toward the illness. Among the three domains, awareness level was the highest [Table 4].

Awareness of epilepsy

The awareness level of our population in this study was high (mean = 1.49 ± 0.22). When asked if respondents heard or read about epilepsy, despite a vast majority of them being familiar with epilepsy, 12% stated that they had not heard about epilepsy. Only 18 respondents had detailed information on epilepsy through courses or lectures or seminars, as they were health-care professionals. The majority of the respondents indicated that the Internet and neighbors were the main sources of information about the illness (total: 60.6%), while 27.1% indicated health-care professionals (doctors and pharmacists). Awareness about epilepsy is summarized in Table 5.

Knowledge of epilepsy

The knowledge level regarding epilepsy was moderate (mean = 1.18 ± 0.37). When each item in this factor was analyzed, we found that only 31.9% of the respondents thought knew the cause of epilepsy, most respondents agreed that (79.9%) epilepsy was not a form of mental illness and could not cause mental retardation (75.8%). Furthermore, more than half of the respondents (53.9%) thought that epilepsy could cause psychological problems, 29.7% did not, while 16.4% were unsure.

While one-fifth of the respondents (20%) did not think epilepsy could be genetically inherited, most of them (80%) agreed that this disease could be genetically inherited. The majority reported that epilepsy could be seen at any age. Although 10.9% of the respondents claimed that epilepsy is not curable, 58.9% denied the notion, while 30.2% were unsure. Similarly, most of the respondents agreed that epilepsy is not contagious (93.6%).

With regard to pregnancy, normal delivery, and having a healthy baby, 52.5% of the respondents thought that women with epilepsy could become pregnant and 38.4% agreed that they could give birth through normal delivery. Despite 13.7% were unsure, the majority (64.4%) believed that there could be a problem in the baby of an epileptic woman. Table 6 displays the responses.

Attitude toward epilepsy

The overall attitude of our study population toward epilepsy was regarded as indifferent (mean = 1.43 ± 0.52). With regard to involvement in sports, 90% of the respondents agreed that patients with epilepsy could participate in sports. More than half of the respondents (54.3%) disagreed that epileptics could drive, while the remaining either agreed (36.5%) or were not sure (9.1%). Besides, most of the respondents (70.3%) disagreed that epileptic males should do military service. Although more than half of the respondents (54%) consented that the epileptics should marry and support

Table 9: Differences in awareness, knowledge, and attitude levels based on gender

Domain	Male	Female	*P*
Awareness	1.28±0.03	1.47±0.6	0.04
Knowledge	1.07±1.12	1.20±0.9	0.01
Attitude	1.12±0.7	1.37±0.2	0.008

Table 10: Awareness, knowledge, and attitude levels based on educational level

Domain	High	Low	*P*
Awareness	1.28±0.8	1.31±0.2	0.4
Knowledge	1.19±0.5	1.09±0.1	0.2
Attitude	1.34±0.7	1.25±0.4	0.1

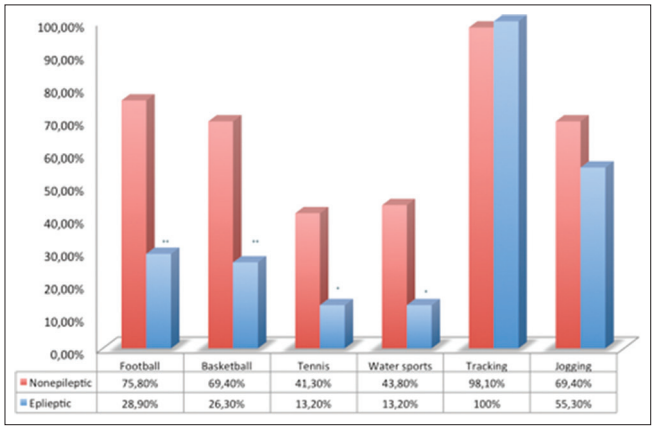

Figure 1: Involvement in sportive activities: although nonepileptics thought that epileptics could engage in all kinds of sports, epileptic respondents stated that they could engage only in recreational sport activities (*: $P < 0.05$; **: $P < 0.01$)

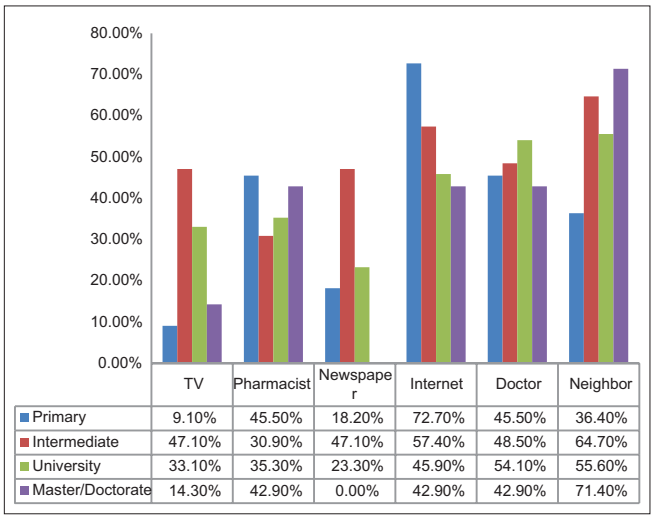

Figure 2: Information sources based on educational levels with regard to indicating health-care professionals as a source of information; there was no statistically significant difference between the groups ($P > 0.05$)

the epileptics' socialization in the community, 30% objected, and 16% were not sure [Table 7].

Comparison of awareness, knowledge, and attitude levels of epileptic and nonepileptic respondents

Total AKA level of epileptics was significantly higher than that of nonepileptics (1.44 ± 0.77 and 1.24 ± 0.40 for epileptics and nonepileptics, respectively; $P = 0.03$) [Table 8]. There was no statistically significant difference in awareness levels between groups (1.50 ± 0.02 and 1.48 ± 0.25 for epileptics and nonepileptics, respectively; $P > 0.05$). In parallel with this finding, none of the epileptic participants had attended any kind of training about the illness. Both groups declared similar sources of information regarding the illness ($P > 0.05$). Although general knowledge levels of epileptic respondents were significantly higher than that of nonepileptics (1.30 ± 0.19 vs. 1.11 ± 0.44, $P = 0.02$), it was still in moderate. Interestingly, with regard to pregnancy, vaginal delivery, and bearing normal healthy baby, the knowledge level of epileptics was lower than that of nonepileptics ($P = 0.005$). This was because most respondents in this group were male. Besides, there were statistically significant differences between epileptic and nonepileptic groups in knowledge regarding the psychological problems and socialization ($P = 0.005$). Although nonepileptics thought that epileptics could engage in all kinds of sports, epileptic respondents stated that they could engage only in recreational sport activities [Figure 1].

Among the three domains, the most notable difference was observed in the attitude levels of the two groups. Although the attitude of the nonepileptics toward the illness was indifferent, in the epileptic group, the attitude was positive (mean = 1.37 ± 0.53 and 1.68 ± 0.39, respectively, $P = 0.00$).

Comparison of awareness, knowledge, and attitude levels based on sociodemographic information

Gender

As for gender differences, females showed significantly better knowledge and awareness levels than men ($P = 0.01$) [Table 9]. Particularly, as expected, there were statistically significant differences in knowledge about pregnancy, vaginal delivery, and bearing healthy baby between genders in favor of females ($P = 0.003$). Consistent with these results, females had positive attitudes toward marriage of epileptics (58.2% and 39.6% for females and males, respectively, $P = 0.02$).

Besides, in their responses, women were more tolerant than men: 62% of women answered all attitude items positively as compared to 43% of men ($P = 0.008$). As for the marital and occupational status, no differences were found between groups ($P > 0.05$ for both comparisons).

Education level

Expectedly,[1] respondents with higher education levels possessed significantly better attitudes (1.34 ± 0.7) toward epilepsy compared to those with lower education level (1.25 ± 0.4) ($P = 0.03$). Furthermore, respondents with higher education levels also reported to have generally better awareness and knowledge levels (1.28 ± 0.8 and 1.19 ± 0.5) compared to those with lower education levels (1.31 ± 0.2 and 1.09 ± 0.1). However, these differences were insignificant [Table 10]. The most interesting result was about the source of knowledge on epilepsy. According to the survey, a vast majority of the respondents with higher education (university and master/doctorate) indicated their neighbors as a major source of information (55.6% and 71.4%, respectively), while respondents with lower education declared the Internet (72.7%) as the main source. With regard to indicating health-care professionals as a source of information, there was no statistically significant difference between the groups (45.5% and 42.9%, respectively, for respondents with higher and lower educational levels; $P > 0.05$) [Figure 2].

Discussion

Content validity and reliability are two key indicators of a qualified measuring instrument. These two ensure the stability and accuracy of the measurement tool.[8] In our study, construct validity test results showed that the questionnaire developed by the researchers is a valid and reliable instrument. To the best of our knowledge, this is the first questionnaire validated in terms of both construct and content validity.

Previous research considered lack of knowledge about epilepsy as an important indicator of negative attitudes toward people with epilepsy.[16] In order to decrease public intolerance and prevent indictment, public awareness, attitude, and knowledge toward epilepsy should be investigated, and misunderstandings and/or misconceptions about this health issue should be identified. Only after gaining such insights, public health campaigns can be held and a management strategy can be improved. This study provided preliminary insights regarding AKA level among community, which could act as a very important basis to formulate an epilepsy educational tool for the nationwide education program.

Unlike similar research in the field, in this community-based study, we found no difference in awareness based on educational levels.[1,17,18] Although most of the respondents had read or heard about epilepsy (88%), it appears that this awareness did not

result from formal education because except from the health-care professionals (n = 18) including the epileptics, none of the respondents had attended a lecture or seminar on the subject. This finding suggests that there is little formal education on epilepsy available in the school setting.

Similar to Rahman *et al*.,[19] in our study, a high proportion of nonepileptic respondents (68%) reported that they did not know the cause of epilepsy, which is relatively higher, compared to similar community-based studies.[20-22] As explained by Rahman *et al*., we believe that this high rate is resulting from the close-ended type of questions used in the questionnaire.[19,23,24]

Misconceptions about mental illness and epilepsy have been reported to be associated with the country's level of development.[18,20,25] In this study, more than half of the nonepileptic respondents could differentiate mental illness and epilepsy. This can be explained with the high education level of our study population. In addition, a high percentage of the respondents thought that epilepsy is not contagious and does not cause mental retardation. These beliefs reinforce the positive perception relating to stigma.[17] More than half of the respondents (54%) consented that the epileptics could marry and support the socialization of the epileptics in the community. These findings again indicate that most respondents hold positive views about patients with epilepsy. Despite these favorable attitudes, more than half of the respondents disagreed that epileptics could drive and serve in the military. We think that this might be due to the lack of knowledge and needs to be improved.

Lack of knowledge about epilepsy has been considered as an important factor in the development of negative attitudes toward people with epilepsy.[26] Responses given to the questions related to pregnancy, childbearing, and health of the baby were gender dependent. Although these questions seem to be more important issues for female participants, they are important in the formation of a general attitude in public as well. In fact, contrary to male responders, positive attitudes of female responders toward marriage provide support to our argument. Furthermore, the general level of tolerance in females was higher than that of males. Similarly, Al-Rashed *et al*. claimed that females are less likely to believe that patients with epilepsy should be restricted from sports, driving, socializing with other people, being employed, or getting married.[27] On the contrary, Nyame *et al*. observed that male respondents perceive epileptics more favorably than their female counterparts.[28] Similarly, Lim *et al*. claimed that females have negative attitudes toward marriage among people with epilepsy.[17] In literature, the results on gender are generally mixed and show no obvious trend globally. According to this study finding, a general public education is necessary. Responses to other aspects of knowledge are generally quite favorable and furthermore, there is no difference between the genders.[17]

With respect to educational level, although respondents with higher education level possessed higher AKA levels, this was not statistically significant. This is resulting from the fact that the educational level of this study population was higher than Turkey's average[29] (Turkey's average is about 42% for primary and middle school graduates). The most interesting result with respect to education level was that while respondents with higher level of education (university and master/doctorate) reported their neighbors as the main source of knowledge, respondents with lower level of education reported the Internet as their main source of information about epilepsy. This result contradicts with the data reported by the Turkish Statistical Institute. According to the statistics of the institute, while only 25% of high school and above graduates reported family members, neighbors, friends, and co-workers as the main source of information, this rate was 38% for the primary and middle school graduates. For the same groups, reporting the Internet as the source of information was 41% and 62%, respectively.[30]

As expected, the knowledge level of the epileptic respondents related to the illness was higher than the nonepileptics. However, their knowledge about certain aspects which is important for the adherence to the antiepileptic therapy, such as eating and drinking behavior, drug administration time, and drug interactions (especially with over-the-counter drugs), must be improved. Community pharmacists' intervention in patients' education is not only effective, but also feasible and compatible with the rest of the activities in community pharmacy. In this study, the respondents declared the community pharmacists and physicians as the main source of information about epilepsy at the same rate, which can be interpreted as a strong indicator of trust on community pharmacists. Even though most of the nonepileptic respondents supported the socialization of epileptics, most epileptic respondents believed that the illness does influence their social life. This can be explained by epileptics' awareness of the problems related to the illness and could also be considered as an indication of epileptics' worries they experience due to the biased attitudes and behaviors they are confronted within their daily lives. In order to prevent any prejudice, nationwide education programs through which the public are accurately and adequately informed about epilepsy should be designed in coordination with the trade bodies such as Turkish Pharmacists' Association, academicians, and health-care authority (Ministry of

Health). In addition, the public should also be informed through different audio-visual informative mediums such as television programs, public service announcements, brochures, handbooks, and pocketbooks.

Conclusion

As in other long-term conditions, this chronic therapy expands the role of community pharmacists in the education of both epileptics and community regarding the illness. We believe that the developed questionnaire is a promising instrument for determining educational needs and offering guidance to health-care professionals in developing standardized educational tools and programs to cater for those needs. In order to transfer standardized information, we suggest that education programs are designed separately both for health-care professionals and the public. Education for the pharmacists should specifically be offered as postgraduate update programs on a regular basis such as seminars organized by the Society of Clinical Pharmacy. Community pharmacists can be informed about the current guidelines on up-to-date antiepileptic therapy. We believe that these findings will guide such nationwide prospective educational programs.

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Conflicts of interest

There are no conflicts of interest.

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