

# Differences of knowledge, attitudes, and behaviors towards epilepsy between populations in municipal and nonmunicipal areas

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**Background:** Information on the knowledge of, and attitudes and practices towards epilepsy of the general population in Thailand is still limited, particularly with respect to the differences between populations in municipal and nonmunicipal areas.

**Methods:** A descriptive cross-sectional survey was conducted in a sample population of 1,000, with 500 participants each from municipal and nonmunicipal areas, in the Khon Kaen district.

**Results:** The participants in the municipal area had higher incomes and higher education than did the participants in the nonmunicipal area. Both groups had low knowledge regarding epilepsy definition, causes, and treatment, but participants in the municipal area were more knowledgeable on the causes, types, and treatment of epilepsy. With respect to attitude, there were a significantly higher number of nonmunicipal participants than municipal participants who thought epilepsy was a disgusting disorder or that persons with epilepsy were sinful, had brain damage, and could not attend school. The municipal participants showed greater knowledge of correct practice than did nonmunicipal participants with regard to the following: not driving a car; avoiding acrobatic sports, fighting, or water sport; able to eat pork, not having to resign from work; not having to quit school; and able to have sexual relations.

**Conclusion:** The participants from the municipal area had better knowledge, attitudes, and practices than did the participants from the nonmunicipal area. A campaign should be carried out to promote knowledge and understanding of, and practices towards epilepsy. Different emphases should be placed on the two groups of populations and different strategies used.

**Keywords:** practice, rural, mental health, stigma

## Introduction

Epilepsy is a prevalent disease in clinical practice. The knowledge, attitudes, and practices (KAP) of epileptic patients are important indicators for the effectiveness of treatment. The KAP of relatives and acquaintances also influences the feelings and practices of persons with epilepsy (PWE).

Previous studies have shown that in Thai communities, the low level of knowledge reflects poor KAP. It is interesting to see that even medical personnel, including medical students and nurses, still have an unsatisfactory level of knowledge and understanding of epilepsy.<sup>1,2</sup> However, studies have not been conducted on the general population at large.

Since municipal and nonmunicipal populations are basically different in education, income, and age, we hypothesized that the two groups might have different levels of KAP towards epilepsy. The differences between these two geographical populations have never been studied, particularly in regards to epilepsy, in the Thai population. This research was aimed at studying whether in fact, the two populations had different levels

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of KAP towards epilepsy, so as to support the future implementation of a project aiming to provide accurate education and to change attitudes and behaviors. This information may suggest strategies to improve epilepsy care in the future.

## Methods

This was a descriptive cross-sectional research study conducted in 1,000 persons of the Muang district, Khon Kaen, Thailand, from April 1, 2008 until December 31, 2008. The population in the study was randomly sampled from the population census and divided into two groups, comprised of 500 people each, from a municipal and a nonmunicipal area.

The following were the inclusion criteria: 1) residing in Muang district, Khon Kaen; 2) aged 18 years and over; 3) fully alert and able to answer questions; 4) able to communicate in Thai; and 5) willing to participate in the project and to give written informed consent.

The survey was conducted by nurses trained in the use of the study questionnaire.<sup>2</sup> The questionnaire was comprised of a section on basic information of the participants and another section on KAP related to epilepsy. The data obtained from the population from the municipal area were compared with the data from the population from the nonmunicipal area, based on descriptive statistics, namely the Students *t*-test, chi-square test, and Fisher exact test.

## Results

Of the 500-person population from the nonmunicipal area, 195 (39%) were male. The average age was 48.7 years, 63% were married, 66.4% had completed primary education or lower, 67.5% were farmers, and the average income was 6,386 Baht/month, the equivalent of 212.87 USD/month (1 USD equals 30 Baht).

The 500-person sample population from the municipal area consisted of 50% males. When compared with the participants residing in the nonmunicipal area, this group had a lower average age level, lower number of married persons, higher level of education, higher income level, and most were business or government employees (Table 1).

### The results of survey on knowledge

The results of the survey on knowledge are presented in Table 2. A significantly higher number of municipal participants had been informed of epilepsy and understood the meanings of epilepsy correctly when compared with the nonmunicipal participants. The difference in the understanding of the cause of epilepsy between the two groups was significant; many of the nonmunicipal participants misunderstood that epilepsy was caused by spiritual possession or being hereditary.

**Table 1** General characteristics of the participants, categorized by municipal area

Details	Nonmunicipal area (N=500)	Municipal area (N=500)
Males (%)	195 (39.0)	250 (50.0)
Average age (SD)	48.7 (20.2)	34.4 (13.0)
Marital status, married (%)	315 (63.0)	219 (43.8)
Level of education (%)		
Primary school or lower	332 (66.4)	59 (11.8)
Secondary school	132 (26.4)	78 (15.6)
Undergraduate certificate or higher	36 (7.2)	363 (72.6)
Occupation (%)		
Unemployed	180 (36.0)	140 (28.0)
Farmers	216 (67.5)	2 (0.56)
Government officials	10 (3.1)	148 (41.1)
Trading	21 (6.6)	107 (29.7)
Average income, Baht/month (SD)	6,386.49 (10,846.52)	36,773.21 (43,580.84)

**Abbreviation:** SD, standard deviation.

Significantly fewer municipal participants knew that epilepsy can be generalized as tonic-clonic seizures than did nonmunicipal participants ( $P<0.001$ ), and significantly more municipal participants knew that seizures could affect any part of the body ( $P<0.001$ ).

With respect to knowledge of treatment, a significantly greater number of nonmunicipal participants than municipal participants reported that epilepsy could be cured and that there was no need to take anticonvulsant all through the patient's life ( $P<0.001$ ).

Generally speaking, the sample populations from both the municipal and nonmunicipal areas of Khon Kaen had a relatively low level of knowledge of the causes and types of seizures.

### The results of survey on attitudes

A question was asked of the feeling of respondents if a family member had epilepsy (Table 3). There was only one factor found for which the attitude of nonmunicipal participants was significantly different from that of municipal participants ( $P<0.001$ ). The nonmunicipal participants believed epilepsy should not be disclosed since it was shameful.

The social attitude factors are shown in Table 4. It can be seen that significantly more municipal participants than nonmunicipal participants believed that people were able to marry PWE and that PWE could be employed. Participants also disclosed that they felt unhappy when a colleague suffered epilepsy.

It can be seen from Table 5 that a significantly higher number of nonmunicipal participants than municipal participants thought epilepsy was a disgusting disorder and that PWE were

**Table 2** Knowledge of epilepsy of participants categorized by municipal area

Details	Nonmunicipal area (N=500)	Municipal area (N=500)	$\chi^2$	P-value
Received knowledge about epilepsy	146 (29.2)	299 (59.8)	94.78	<0.001
Knowing the correct definition of epilepsy	292 (43.2)	384 (56.8)	36.77	<0.001
Causes of epilepsy				
Exorcism	18 (3.6)	3 (0.6)	10.94	0.001
Hereditry	275 (55.0)	236 (47.2)	6.09	0.014
Tumor	51 (10.2)	187 (37.4)	101.99	<0.001
Divine penalty	6 (1.2)	2 (0.4)	–	0.287*
Eating pork	139 (27.8)	46 (9.2)	57.36	<0.001
Brain accident	245 (49.0)	336 (67.2)	34.02	<0.001
Heavy drinking	170 (34.0)	103 (20.6)	22.62	<0.001
Abrupt alcohol withdrawal	53 (10.6)	49 (9.8)	0.18	0.676
Renal/liver failure	18 (3.6)	20 (4.0)	0.11	0.741
Cerebrovascular disease	262 (52.4)	293 (58.6)	3.89	0.049
Cysticercosis	122 (24.4)	129 (25.8)	0.26	0.610
Possession	19 (3.8)	9 (1.8)	3.67	0.055
Brain calcification	31 (6.2)	26 (5.2)	0.47	0.495
Black magic	7 (1.4)	5 (1.0)	0.34	0.561
Seizures				
Tonic-clonic seizures	456 (91.2)	415 (83.0)	14.96	<0.001
Secondary generalized seizures	191 (38.2)	326 (65.2)	72.98	<0.001
Absence of seizures	101 (20.2)	101 (20.2)	0.00	>0.999
Complex partial seizures	130 (26.0)	133 (26.6)	0.05	0.829
Atonic seizures	318 (63.6)	330 (66.0)	0.63	0.427
Strange behaviors	103 (20.6)	102 (20.4)	0.01	0.938
Aggressive behaviors	27 (5.4)	13 (2.6)	5.10	0.024
Causes of epilepsy attack				
Touch patient's saliva	12 (2.8)	6 (1.4)	–	0.293*
Direct contact	4 (0.9)	2 (0.5)	–	–
Sexual intercourse	4 (0.9)	2 (0.5)	–	–
Eating with patient	5 (1.2)	1 (0.2)	–	–
Noncontagious disease	403 (94.2)	412 (97.4)	–	–
Curable	295 (77.0)	252 (61.3)	27.60	<0.001
Lifelong medication	270 (55.9)	184 (37.5)	64.16	<0.001

**Notes:** Degrees of freedom =1 for all variables, except knowing the correct definition of epilepsy. \*Fisher's exact test.

sinful, had brain damage, and could not attend school. On the other hand, significantly more municipal participants stated that PWE should be treated by medical doctors.

As far as practices and care towards epilepsy were concerned (Table 6), significantly more nonmunicipal participants than municipal participants believed PWE should be closely taken care of (questionnaire items 1, 2,

and 5), and some understood that epilepsy could be cured ( $P=0.001$ ).

### The results of survey on practices towards seizure attack

The participants were asked what they would choose to do while PWE were having a seizure (Table 7). It was found that

**Table 3** Participant's actions when one family member has epilepsy, categorized by municipal area

Factors	Nonmunicipal area (N=500)	Municipal area (N=500)	$\chi^2$	P-value
Should not tell anyone: shameful	32 (6.4)	7 (1.4)	16.68	<0.001
Should tell public health officer	475 (95.0)	485 (97.0)	2.60	0.107
Should tell exorcist to initiate exorcism	5 (1.0)	3 (0.6)	–	0.725*
Household treatment using herbal medicine	60 (12.0)	39 (7.8)	4.94	0.026
See a monk to do away with bad luck	16 (3.2)	24 (4.8)	1.67	0.197
Do nothing, for it is normal	30 (6.0)	31 (6.2)	0.02	0.895

**Notes:** Degrees of freedom =1 for all variables. \*Fisher's exact test.

**Table 4** Social attitudes towards epilepsy of participants, categorized by municipal area

Factors	Nonmunicipal area (N=500)	Municipal area (N=500)	$\chi^2$	P-value
Make friends with PWE	437 (87.4)	461 (92.2)	5.775	0.016
Can marry with a PWE	143 (28.6)	186 (37.2)	7.991	0.005
Will employ a PWE	160 (32.0)	231 (46.2)	20.578	<0.001
Not happy to have a PWE as a colleague	270 (54.0)	189 (37.8)	25.773	<0.001
Let children play with a PWE	419 (83.8)	426 (85.2)	0.275	0.600
Let children learn with a PWE	453 (90.6)	458 (91.6)	0.197	0.657

**Note:** Degrees of freedom =1 for all variables.

**Abbreviation:** PWE, persons with epilepsy.

**Table 5** Attitudes towards persons with epilepsy, categorized by municipal area

Factors	Nonmunicipal area (N=500)	Municipal area (N=500)	$\chi^2$	P-value
Disgusting	26 (5.2)	1 (0.2)	23.79	<0.001
Sinful	80 (16.0)	9 (1.8)	62.17	<0.001
Weak, cannot work	52 (10.4)	39 (7.8)	2.04	0.153
Should see a doctor	359 (71.8)	445 (89.0)	46.93	<0.001
Brain damage, cannot go to school	29 (5.8)	12 (2.4)	7.35	0.007
Pitiful, want to help	272 (54.4)	213 (42.8)	13.94	<0.001
Should see a monk	472 (94.4)	482 (96.4)	2.28	0.131

**Note:** Degrees of freedom =1 for all variables.

**Table 6** Thoughts about persons with epilepsy, categorized by municipal area

Factors	Nonmunicipal area (N=500)	Municipal area (N=500)	$\chi^2$	P-value
Must give close and complete care	335 (71.0)	269 (53.8)	31.52	<0.001
Not much care; they can take care of themselves	94 (18.8)	216 (43.2)	69.59	<0.001
No need; it will be cured	30 (6.0)	9 (1.8)	11.77	0.001
Should be admitted to hospital	80 (16.0)	75 (15.0)	0.19	0.662
Should help only when needed	72 (14.4)	164 (32.8)	46.94	<0.001
No need; they are normal	11 (2.2)	4 (0.8)	3.32	0.069
Should stay away; it is contagious	2 (0.4)	4 (0.8)	–	0.687*

**Notes:** Degrees of freedom =1 for all variables. \*Fisher's exact test.

**Table 7** Practice when seeing a person having seizures, categorized by municipal area

Factors	Nonmunicipal area (N=500)	Municipal area (N=500)	$\chi^2$	P-value
Lay him down on the back, turn head to one side	345 (69.0)	192 (38.4)	94.15	<0.001
Put a spoon in the mouth to prevent tongue biting	168 (33.6)	153 (30.6)	1.03	0.310
Loosen tight clothes	324 (64.8)	156 (31.2)	113.08	<0.001
Give anticonvulsant immediately during seizure	451 (90.2)	436 (87.2)	2.25	0.314
Prevent injury during seizure	429 (85.8)	233 (46.6)	171.69	<0.001
If patient is agitated, tie him down	456 (91.2)	387 (77.4)	35.97	<0.001
Leave patient and get someone to help	432 (86.4)	485 (97.0)	36.91	<0.001
If seizure lasts more than 15 minutes or recurs, send him to hospital	413 (82.6)	311 (62.2)	52.07	<0.001
Put a chili or lime juice in the mouth	8 (1.6)	1 (0.2)	–	0.038*
Conduct cardiac massage	72 (14.4)	10 (2.0)	51.06	<0.001
Pour water on patient	21 (4.2)	0	–	<0.001*
Shake patient violently and call his name	73 (14.6)	53 (10.6)	3.63	0.057
Massage arms and legs	146 (29.2)	28 (5.6)	96.88	<0.001

**Notes:** Degrees of freedom =1 for all variables. \*Fisher's exact test.

significantly more nonmunicipal participants than municipal participants could care for the patient satisfactorily, reflected in the following practices: laying the patient on their back and turning the head to one side ( $P<0.001$ ), loosening tight clothes ( $P<0.001$ ), preventing injury during seizure ( $P<0.001$ ), and sending the patient to hospital if the seizure lasts more than 15 minutes or if there is an immediate recurrence ( $P<0.001$ ). However, significantly more nonmunicipal participants than municipal participants indicated the following wrongdoing for the patient: conducting cardiac massage ( $P<0.001$ ), pouring water on the patient ( $P<0.001$ ), and massaging arms and legs ( $P<0.001$ ).

The last question was on the practices if the respondents themselves had epilepsy (Table 8). It was found that significantly more municipal participants showed correct practices than did nonmunicipal participants for the following: not driving a car ( $P<0.001$ ); avoiding acrobatic sports, fighting, and water sports ( $P<0.001$ ); being able to eat pork ( $P<0.001$ ), not having to resign from work ( $P=0.001$ ); not having to quit school ( $P<0.001$ ); and being able to have sexual intercourse ( $P<0.001$ ). Significantly more nonmunicipal participants than municipal participants would not stop taking anticonvulsants while being pregnant ( $P=0.001$ ).

## Discussion

This research studied the KAP towards epilepsy of Thai populations, which has not been done before in the general population. In general, it was found that the level of KAP towards epilepsy was low in both the municipal and

nonmunicipal groups studied. This finding is easy to understand when compared with the similar results from a survey conducted on teachers and medical personnel, including nurses and medicine students.<sup>1,2</sup> Some aspects of KAP in the Thai population were found to be different from those in other countries.<sup>3-14</sup>

A study from the US showed that epilepsy is a social stigma and that 52% of participants had heard about epilepsy.<sup>3</sup> Participants in the municipal area in the current study had knowledge about epilepsy, similar to the US study (59.8%), but not the participants in the nonmunicipal area (29.2%), as shown in Table 3. Similar to people in Seoul and Greece, epilepsy was believed to be an inherited disease (55.0% of nonmunicipal and 47.2% of municipal participants).<sup>5,9</sup>

The municipal participants were more likely to marry with PWE (37.2% versus 28.6%) ( $P<0.001$ ) in this study, as shown in Table 4.<sup>9</sup> Only 11.5% of people in Jordan would marry with PWE.<sup>8</sup> In Taiwan, 72% of people believed that PWE were able to get married, but only 30% in this study believed this.<sup>6</sup> As parents, more than 80% of participants in both of the two study populations would allow their children to play with PWE (Table 4). This finding was similar to the study from Hong Kong<sup>12</sup> but not in Jordan<sup>7</sup> (<50%). A study in New Zealand found very favorable attitudes on PWE;<sup>13</sup> only 5% of surveyed subjects in New Zealand would not allow PWE to get married.

When the data obtained from the municipal participants and nonmunicipal participants were compared, it was found that a higher number of municipal participants had better KAP related to self-care in epilepsy than did their

**Table 8** Practices of persons with epilepsy, categorized by municipal area

Factors	Nonmunicipal area (N=500)	Municipal area (N=500)	$\chi^2$	P-value
Do not stop taking anticonvulsant	369 (73.8)	356 (71.2)	0.85	0.357
Should stop driving	356 (63.0)	428 (85.6)	30.61	<0.001
Should not drink alcohol	315 (63.0)	344 (68.8)	3.74	0.053
Should have enough sleep	199 (39.8)	219 (43.8)	1.64	0.200
Avoid acrobatics, fighting, violent sports, or water sports	260 (52.0)	357 (71.4)	39.82	<0.001
Should stop taking medicine during pregnancy	33 (6.6)	63 (12.6)	10.37	0.001
Do not breastfeed your baby	21 (4.2)	19 (3.8)	0.10	0.747
Do not eat pork	99 (19.8)	26 (5.2)	48.72	<0.001
Resign from work	28 (5.6)	8 (1.6)	11.53	0.001
Resign from school	15 (3.0)	0	–	<0.001
Take medicine only when having seizures	16 (3.2)	22 (4.4)	0.98	0.321
PWE can get married	173 (34.6)	158 (31.6)	1.01	0.313
Can get pregnant	146 (29.2)	124 (24.8)	2.46	0.117
Do not have sexual intercourse	25 (5.0)	5 (1.0)	13.76	<0.001
Do not eat with others	11 (2.2)	5 (1.0)	2.29	0.130

**Note:** Degrees of freedom = 1 for all variables.

**Abbreviation:** PWE, persons with epilepsy.

nonmunicipal counterparts. On the contrary, more municipal participants did not know the correct practices towards PWE when they were suffering seizures. The differences between the municipal and nonmunicipal populations were more than geographical – they reflect populations that are educationally different as well as different in age and income (Table 1).

The nonmunicipal area in this study was about 30 kilometers away from the city center. The participants lived together as a family in several villages and had agriculture as the principal occupation. Due to the differences of both studied groups, campaigns to improve epilepsy awareness in the municipal and nonmunicipal communities may need to be different. Thus, in the municipal area, most participants were highly educated, worked in offices, and had higher incomes. In municipal area, the education campaign could take place in department stores or public areas on weekends. Having movie stars or singers as communicators would be interesting for municipal residents. Web-based education<sup>15</sup> or education via social media networks may also be feasible options for the municipal area. In contrast, local representatives in the villages, such as village leader, public health medical personnel, monks, or teachers, should be the persons to communicate with participants in nonmunicipal areas. Funding should come from the government, and also, support from local business companies could be encouraged, as a public service. A campaign could also be done on both local radio and TV. This way, celebrities could be involved in both municipal- and nonmunicipal-area efforts but with different messages to fit the different needs. Learning about epilepsy in the classroom in primary schools could also be important due to the high prevalence of epilepsy in school-age children.

To conclude, a campaign should be carried out to promote knowledge to better understand epilepsy and the proper practices for PWE. Such programs should emphasize different aspects for people in municipal areas and in nonmunicipal areas.

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## Disclosure

The authors report no conflicts of interest in this work.

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