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 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.¹,² 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...
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. 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           | 36,773.21                |
| Baht/month (sD)          | (10,846.52)                | (43,580.84)              |

Abbreviation: sD, standard deviation.

Significantly fewer municipal participants knew that epilepsy can be generalized as tonic-clonic seizures than 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)              | 37.67   | <0.001  |
| Causes of epilepsy                                                       |                           |                         |         |         |
| Exorcism                                                                | 18 (3.6)                  | 3 (0.6)                 | 10.94   | 0.001   |
| Heredity                                                                | 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                                                       | 101 (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)                 |         |         |
| 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. Some aspects of KAP in the Thai population were found to be different from those in other countries. A study from the US showed that epilepsy is a social stigma and that 52% of participants had heard about epilepsy. 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).

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. Only 11.5% of people in Jordan would marry with PWE. In Taiwan, 72% of people believed that PWE were able to get married, but only 30% in this study believed this. 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 but not in Jordan (<50%). A study in New Zealand found very favorable attitudes on PWE, 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

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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 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

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