# CHAPTER IV

## RESULTS

The results of data analysis will be presented in 5 parts as follows:

1. Descriptive statistics of socio-demographic data of Family Health Leaders: socio-demographic, predisposing, enabling, and reinforcing characteristics (all independent variables), and preventive behaviors against dengue fever (dependent variables).

2. Relationships of socio-demographic factors with preventive behaviors

3. Relationships of other predisposing factors (knowledge and attitude) with preventive behaviors.

4. Relationships of enabling factors with preventive behaviors.

5. Relationships of reinforcing factors with preventive behaviors.

Sections 2-5 assess associations between independent and dependent variables. With some exceptions, only statistically significant ($p <= 0.05$) and marginally significant associations ($0.05 < p <= 0.10$) are presented in this chapter. The remaining non-significant associations ($p > 0.10$) appear in Appendix F.

## 1. Descriptive statistics of socio-demographic data of Family Health Leaders predisposing, enabling, and reinforcing characteristics, and preventive behaviors.

## 1.1 Socio-Demographic Characteristics

The majority of Family Health Leaders were female (72.2%) aged 19 years to 77 years (45.96 years on average), with standard deviation of 11.46 years and 32.7% aged between 36 years to 45 years. More than half of respondents (78.2%) were married and living together. Most of them were educated at the primary school level (82.9%) and 63.6% had an agricultural occupation. The most common family income was 2,500 to 4,000 baht per month (29.1%). They were living in Kongkrailat district 36 - 45 years (33.3%). The family size had 2 persons or less than in family (37.6%) and 47 families ever had dengue infection history (10.4%). Socio-demographic characteristics are presented in Table 4.

**Table 4:** Number and percentage of the respondents by socio-demographic

characteristics (n = 450)

| Characteristics | Number | Percentage |
|---|---|---|
| Gender | | |
| Male | 123 | 27.3 |
| Female | 327 | 72.7 |
| Age group | | |
| ≤ 35 years | 83 | 18.4 |
| 36 – 45 years | 147 | 32.7 |
| 46 – 55 years | 118 | 26.2 |
| ≥ 56 years | 102 | 22.7 |
| $\bar{X}$ = 45.96      S.D. = 11.46 | Minimum = 19 | Maximum = 77 |
| Marital status | | |
| Single | 44 | 9.8 |
| Married / living together | 352 | 78.2 |
| Married / separated | 8 | 1.8 |
| Widowed | 38 | 8.4 |
| Divorced | 8 | 1.8 |
| Education level | | |
| Primary school | 373 | 82.9 |
| Secondary school | 43 | 9.6 |
| High school or higher | 34 | 7.5 |
| | | |
| Occupation | | |
| Unemployed | 24 | 5.3 |
| Housewife | 43 | 9.6 |
| Government officer | 5 | 1.1 |
| Agricultural | 286 | 63.3 |
| Commercial/business | 68 | 15.1 |
| Other | 34 | 7.6 |
| Income (Baht/month) | | |
| ≤ 2,500 | 95 | 21.1 |
| 2,500 – 4000 | 131 | 29.1 |
| 4001 – 6000 | 124 | 27.6 |
| ≥ 6001 | 100 | 22.2 |
| $\bar{X}$ = 5,189.44      S.D.= 3,950.15 | Minimum = 500 | Maximum = 30,730 |
| Duration of living in Kongkrailat District | | |
| ≤ 35 years | 105 | 23.3 |
| 36 – 45 years | 150 | 33.3 |
| 46 – 55 years | 108 | 24.0 |
| ≥ 56 years | 87 | 19.3 |
| $\bar{X}$ = 43.63      S.D.= 13.089 | Minimum = 2 | Maximum = 72 |

**Table 4:** Number and percentage of the respondents by socio-demographic

characteristics (n = 450)

| Characteristics | Number | Percentage |
|---|---|---|
| Members of family | | |
| ≤ 2 | 169 | 37.6 |
| 3 | 135 | 30.0 |
| ≥ 4 | 146 | 32.4 |
| Dengue infection history in family | | |
| Yes | 47 | 10.4 |
| No | 403 | 89.6 |

**1.2 Predisposing factors;** consist of knowledge about dengue infection and

attitude towards dengue infection.

**1.2.1 Knowledge about dengue infection**

This study revealed that, from a maximum possible score of 15, family

health leaders mostly had the level of knowledge about dengue infection in the level

of moderate to high level (see table 5). Most of the knowledge at moderate level (55.6

%) followed with high level (31.1 %) and low level (13.3 %). The average score of

the knowledge was moderate level at 10.40 points, the standard deviation 2.00, the

minimum scores as 2, and maximum scores as 14.

**Table 5:** Number and percentage of the respondents by the level of knowledge

about dengue infection

| Level of knowledge | Number (n = 450) | Percentage |
|---|---|---|
| High knowledge (score 12 – 15) | 140 | 31.1 |
| Moderate knowledge (score 9 – 11) | 250 | 55.6 |
| Low knowledge (score 0 – 8) | 60 | 13.3 |
| $\bar{X}$ = 10.40          S.D. = 2.00 | Minimum = 2 | Maximum = 14 |

Responses for the 15 specific knowledge items are summarized in Table 6. When considering in each item of the knowledge about dengue infection, which had 15 items. In all, 98.0% of subjects knew that discarded bottles, old tyres, and coconut shells outside the house can be breeding places for mosquitoes (item 13). The question with the least number of correctly answered, 18.7% was the question concerning vaccination can prevent dengue infection (item 8).

**Table 6:** Number and percentage of the items on the knowledge about dengue infection correctly answered by respondents. (n = 450)

| Items | Number | Percentage |
|---|---|---|
| 13. The breeding places outside the house | 441 | 98.0 |
| 11. The best method for prevent dengue infection | 429 | 95.3 |
| 1. The name of the vector for dengue infection | 425 | 94.4 |
| 2. Day bite mosquito are causing dengue infection | 424 | 94.2 |
| 6. Dengue patient can die if not the right treatment | 422 | 93.8 |
| 12. Weekly change water can reduce dengue mosquito | 396 | 88.0 |
| 4. Symptoms of dengue infection | 386 | 85.8 |
| 7. Paracetamal is a drug of choice for reduce fever | 373 | 82.9 |
| 14. Cleaning the container can get rid of mosquito eggs | 360 | 80.0 |
| 15. Children should use repellent everyday | 245 | 54.4 |
| 3. All season can cause dengue infection | 210 | 46.7 |
| 5. Who can get dengue infection | 203 | 45.1 |
| 10. The breeding places for mosquito that lay eggs | 175 | 38.9 |
| 9. Volume of temephos sand for put in water jar | 109 | 24.2 |
| 8. Vaccination can prevent dengue infection | 84 | 18.7 |

### 1.2.2 Attitude towards dengue infection

Most of respondents had fair level of attitude toward prevention and control of dengue infection 41.5%, good level of attitude 38.7% and poor attitude level 19.8%. The average score was 38.76 from a total maximum of 45, standard deviation was 4.13, the minimum scores and the maximum scores were 23 and 45, respectively, as shown in Table 7.

**Table 7:** Number and percentage of the respondents by the level of attitude towards dengue infection

| Level of attitude | Number (n = 450) | Percentage |
|---|---|---|
| Good level (score 41 - 45) | 174 | 38.7 |
| Fair level (score 36 - 40) | 187 | 41.5 |
| Poor level (score 15 - 35) | 89 | 19.8 |
| $\bar{X}$ = 38.76        S.D. = 4.13 | Minimum = 23 | Maximum = 45 |

Answers for specific attitude items are summarized in Table 8. Generally, percentages with good attitudes on positive statements were higher than corresponding percentages for negative statements.

**Table 8:** Percentage of the respondents by the attitude towards dengue infection

in each item. (n = 450)

| Statement | Agree | Uncertain | Disagree | $\bar{X}$ | S.D. |
|---|---|---|---|---|---|
| | % | % | % | | |
| **The positive statements ("Agree" is best answer)** | | | | | |
| 3. You are important person in preventive and control dengue infection. | 84.9 | 10.7 | 4.4 | 2.80 | 0.50 |
| 9. Sleeping in mosquito net or screens on window and door can prevent dengue infection | 87.8 | 8.4 | 3.8 | 2.84 | 0.46 |
| 11. Advantage of tight cover will prevent mosquito laying egg | 89.1 | 4.4 | 6.4 | 2.83 | 0.52 |
| 13. Everybody has a chance to be infected with dengue virus | 80.0 | 16.4 | 3.6 | 2.76 | 0.50 |
| **The negative statements ("Disagree" is best answer)** | | | | | |
| 1. A strong person will not get dengue infection | 11.6 | 28.4 | 60.0 | 2.48 | 0.70 |
| 2. Dengue infection can cure itself without treatment | 5.3 | 3.1 | 91.6 | 2.86 | 0.48 |
| 4. No need to get rid of the mosquito breeding places in family who's never infected | 4.7 | 8.0 | 87.3 | 2.83 | 0.49 |
| 5. Eliminating the breeding places of mosquito as vector of dengue infection is very expensive | 13.8 | 14.4 | 71.8 | 2.58 | 0.72 |
| 6. Dengue infection is a disease that can not be prevented | 8.4 | 14.0 | 77.6 | 2.69 | 0.62 |
| 7. Person more than 20 years old can not get dengue infection | 3.8 | 21.1 | 75.1 | 2.71 | 0.53 |
| 8. Eliminating mosquito larvae in drain pipe can prevent and control dengue infection | 67.3 | 17.1 | 15.6 | 1.48 | 0.75 |
| 10. Dengue infection prevention is responsibility of the public health staff only | 44.0 | 10.2 | 45.8 | 2.02 | 0.95 |
| 12. Only fogging spray is enough to prevent mosquito, no need for other method. | 10.9 | 13.8 | 75.3 | 2.64 | 0.67 |
| 14. Person who ever got dengue infection, can not get it again | 9.1 | 32.7 | 58.2 | 2.49 | 0.66 |
| 15. Don't put temephos sand in utility jars because it can make danger of human and pet. | 5.1 | 16.4 | 78.4 | 2.73 | 0.55 |

**1.3 Enabling factors;** consist of sufficiency of resources for prevention on dengue infection.

When considering each of the items of the resources found that all of respondents had mosquito net or screen with good condition. Most of respondents don't have the cover water container (298 or 66.2%) but they used at least one method for prevention of mosquito egg laying in water containers such as put temephos larvicidal sand, change water every week, etc. Amongst 298 families, put temephos sand in water container 96.3% and change water container every week 86.24%. 81 families (18.0%) reported not having sufficient temephos sand, and 163 families (36.2%) reported an insufficient amount of existing local resources. On balance, all families had sufficiency of at least one resource, and the great majority had sufficiency of more than one. Details are given in Table 9.

**Table 9:** Number and percentage of the respondents by the sufficiency of resources

for prevention and control dengue infection.

| Type of resources | | Number | Percentage |
|---|---|---|---|
| Mosquito net/screen | Have with good condition | 450 | 100.0 |
| | Don't have | 0 | 0 |
| Cover of water container | Have | 152 | 33.8 |
| | Don't have | 298 | 66.2 |
| Temephos sand | Enough throughout year | 369 | 82.0 |
| | Not enough | 81 | 18.0 |
| Other resources | Use | 287 | 63.8 |
| | Don't use | 163 | 36.2 |

**1.4 Reinforcing factors;** consist of the frequency with which respondents received information regarding dengue infection, and the number of sources from which they received this information (such as health officer, health volunteer, etc.).

### 1.4.1 Frequency of receiving information

Most of Family Health Leaders received the information with high frequency 68.9%; followed by moderate frequency 29.1% and low frequency 2.0% (see table 10). The average score were 33.61 scores, standard deviation was 4.623. The minimum score was 15 and the maximum score was 40, equal to the maximum possible. Table 11 gives frequencies with which they received specific information items.

**Table 10:** Number and percentage of the respondents by the level of receiving

information about dengue infection.

| Receive information | Number (n = 450) | Percentage |
|---|---|---|
| High (score 36 - 40) | 165 | 36.7 |
| Moderate (score 31 - 35) | 176 | 39.1 |
| Low (score 0 - 30) | 109 | 24.2 |
| $\bar{X}$ = 33.61    S.D. = 4.623 | Minimum = 15 | Maximum = 40 |

**Table 11:** Percentage of the respondents on receiving information items about dengue infection from media or person.

| Information | More than once | Once | Never | $\bar{X}$ | S.D. |
|---|---|---|---|---|---|
| | % | % | % | | |
| 1. *Aedes aegypti* mosquito is the cause of dengue infection | 96.4 | 1.3 | 2.2 | 1.94 | 0.32 |
| 2. Even you got dengue infection, you can infect it again | 83.1 | 5.8 | 11.1 | 1.72 | 0.65 |
| 3. Severity of dengue infection can cause of death | 92.0 | 4.4 | 3.6 | 1.88 | 0.42 |
| 4. To avoid mosquito bite is the one method for prevent dengue infection | 95.3 | 4.0 | 0.7 | 1.95 | 0.25 |
| 5. To eliminate breeding places can reduce risk in dengue infection | 94.2 | 4.0 | 1.8 | 1.92 | 0.33 |
| 6. If you have a high fever paracetamal is a drug of choice | 87.6 | 6.7 | 5.8 | 1.82 | 0.51 |
| 7. If you have a high fever, you don't sure that get dengue infection or not should see the doctor immediately | 85.8 | 6.2 | 8.0 | 1.78 | 0.58 |
| 8. Sleeping in mosquito net/ screen can prevent dengue infection | 83.1 | 10.4 | 6.4 | 1.77 | 0.56 |
| 9. Should read the label carefully before use repellent | 66.0 | 15.1 | 18.9 | 1.47 | 0.79 |
| 10. Some repellent don't use for children younger than 4 years old | 46.0 | 18.0 | 36.0 | 1.10 | 1.90 |
| 11. Temephos sand should put in cement tank in the bathroom or latrine only | 58.7 | 9.3 | 32.0 | 1.27 | 0.92 |
| 12. Put temephos sand 20 grams per water 200 litre | 77.8 | 8.4 | 13.8 | 1.64 | 0.71 |

**Table 11:** Percentage of the respondents on receiving information items about

dengue infection from media or person. (cont.)

| Information | More than | Once | Never | $\bar{X}$ | S.D. |
|---|---|---|---|---|---|
| | % | % | % | | |
| 13. Don't use insecticide spray if it is not necessary | 62.9 | 17.6 | 19.6 | 1.43 | 0.80 |
| 14. Don't use mosquito coil in baby room, patient room, and elderly room | 71.6 | 6.4 | 22.0 | 1.50 | 0.83 |
| 15. If you don't have temephos sand, local resources can use replace | 66.0 | 13.8 | 20.2 | 1.46 | 0.81 |
| 16. Plant or herbal in local area can use replace the repellent | 70.2 | 18.0 | 11.8 | 1.58 | 0.69 |
| 17. To eliminate breeding places for prevent dengue infection | 96.2 | 3.8 | 0.0 | 1.96 | 0.19 |
| 18. Should avoid the dark area, no light and no wind zone | 83.3 | 13.1 | 3.6 | 1.80 | 0.48 |
| 19. Adults and elderly can get dengue infection | 88.9 | 4.7 | 6.4 | 1.82 | 0.52 |
| 20. FHL is important person that can help prevent dengue infection in family | 86.7 | 6.0 | 7.3 | 1.79 | 0.56 |

**1.4.2 Accessibility to information about dengue infection from sources of information in the last year.**

Family Health Leaders were allowed to select more than one source for received information about dengue infection. Most of them received information from village health volunteer (97.8%) followed by health officer (97.6%) and television (83.6%). Smaller percentages reported receiving information from newspaper, and relative/friend, as shown in Table 12.

**Table 12:** Number and percentage of sources that receive information about dengue

infection

| Information sources | Never | | Ever | |
|---|---|---|---|---|
| | Number | % | Number | % |
| Village health volunteer | 10 | 2.2 | 440 | 97.8 |
| Health officer | 11 | 2.4 | 439 | 97.6 |
| Television | 74 | 16.4 | 376 | 83.6 |
| Announcement from public health | 126 | 28.0 | 324 | 72.0 |
| Village health line | 172 | 38.2 | 278 | 61.8 |
| Brochures/Leaflet | 185 | 41.1 | 265 | 58.9 |
| Radio | 193 | 42.9 | 257 | 57.1 |
| Relative/Friend | 238 | 52.9 | 212 | 47.1 |
| Newspaper | 312 | 69.3 | 138 | 30.7 |

### 1.5 Preventive behaviors against dengue infection

In the study questionnaire, there were 16 items that related to preventive behavior against dengue infection of Family Health Leaders. Responses regarding each of these are summarized in Table 13. For 8 of the 16 items, distributions of responses did not allow meaningful assessment in relation to independent variables. These items are marked with asterisks in Table 13. The remaining 8 analyzable items fell into 3 categories: (1) prevention of breeding places (items 1, 2, and 7); (2) prevention of mosquito bite (items 11, 13, and 14) and (3) participation in community-level anti-dengue activities (items 15 and 16).

**Table 13:** Number and percentage of container that respondents have or don't have

| Item | Have | | Don't have | |
|---|---|---|---|---|
| | **Number** | **%** | **Number** | **%** |
| 1. Drinking water jar | 436 | 96.9 | 14 | 3.1 |
| 2. Utility water jar | 440 | 97.8 | 10 | 2.2 |
| 3. Flower pots in house* | 21 | 4.7 | 429 | 95.3 |
| 4. Flower vases* | 46 | 10.2 | 404 | 89.8 |
| 5. Plates supporting plant pots* | 25 | 5.6 | 425 | 94.4 |
| 6. The ant trap* | 262 | 58.2 | 188 | 41.8 |
| 7. Cement tanks, toilet tanks | 444 | 98.7 | 6 | 1.3 |
| 8. Discarded can and coconut shell* | 140 | 31.1 | 310 | 68.9 |
| 9. Pond, lotus bowl in garden* | 44 | 9.8 | 406 | 90.2 |
| 10. Water container for pets* | 136 | 30.2 | 314 | 69.8 |
| 11. Mosquito net | 435 | 96.4 | 16 | 3.6 |
| 12. Mosquito screen on windows* | 33 | 7.3 | 417 | 92.7 |
| 13. Insecticide spray | 103 | 22.9 | 347 | 77.1 |
| 14. Mosquito coil | 279 | 62.0 | 171 | 38.0 |
| 15. Community fogging spray | 450 | 100.0 | 0 | 0 |
| 16. Campaign in prevention/control | 450 | 100.0 | 0 | 0 |

* Sample size too small to allow meaningful analysis in relation to independent variables.

There were 38 subjects (8.44%) with missing data in one or more of these 8 items, leaving 412 subjects (91.56%) with no missing data. To avoid bias due to missing information, analysis of relationships between independent and dependent variables was restricted to these 412 subjects. For each of items 1, 2, and 7, a continuous score was derived for preventive behavior regarding mosquito breeding

places. Then scores for all 3 of these items were summed, and the resulting total score

was categorized into 3 groups, termed good, fair, and poor. The study revealed a poor

level of preventive behaviors 42.2%, followed by good and fair behaviors at 29.9 and

27.9, respectively. The average score was 22.03, standard deviation was 4.64, as

shown in Table 14.

**Table 14:** Number and percentage of the respondents by the level of preventive

behaviors against dengue infection in controlling breeding places.

| Preventive behaviors | Number (n = 412) | Percentage |
|---|---|---|
| Good level (score ≥ 25) | 123 | 29.9 |
| Fair level (score 21- 24) | 115 | 27.9 |
| Poor level (score ≤ 20) | 174 | 42.2 |
| $\overline{X}$ = 22.03      S.D. = 4.64 | Minimum = 11 | Maximum = 34 |

The remaining 5 preventive behavior items were all assessed as zero-one

indicator variables (dummy variables), with value zero indicating relatively poor

behavior and value 1 indicating relatively good behavior. Most respondents had good

preventive behaviors in always cooperating in fogging spray 91.5%, followed by

always cooperating in community-level campaign, and using mosquito coil at 68.7%

and 61.7%, respectively, as shown in Table 15

**Table 15:** Number and percentage of the respondents by the level of preventive

behaviors against dengue infection in prevention of mosquito bite

and activities in prevention dengue infection (n = 412)

| Item | Yes | | No | |
|------|-----|-----|-----|-----|
| | **Number** | **%** | **Number** | **%** |
| **Prevention of mosquito bite** | | | | |
| Use mosquito net in the daytime | 163 | 39.6 | 249 | 60.4 |
| Use insecticide spray | 86 | 20.9 | 326 | 79.1 |
| Use mosquito coil | 254 | 61.7 | 158 | 38.3 |
| **Community-level cooperation against dengue infection** | | | | |
| Always cooperate in fogging spray | 377 | 91.5 | 35 | 8.5 |
| Always cooperate in campaign | 283 | 68.7 | 129 | 31.3 |

## 2. Relationships of socio-demographic factors with preventive behaviors.

Gender had no association with preventive behaviors in controlling breeding

places on dengue infection among Family Health Leaders in this study (p = 0.968), as

shown in Table 16

**Table 16:** Association between gender and preventive behaviors against dengue

infection in controlling breeding places.

| Preventive behaviors regarding breeding places | Gender | | | | | |
|------|------|------|------|------|------|------|
| | Male | | Female | | Total | |
| | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| Poor | 49 | 43.0 | 125 | 41.9 | 174 | 42.2 |
| Fair | 32 | 28.4 | 83 | 27.9 | 115 | 27.9 |
| Good | 33 | 28.9 | 90 | 30.2 | 123 | 29.9 |
| Total | 114 | 100.0 | 298 | 100.0 | 412 | 100.0 |

$$X^2 = 0.066 \qquad df = 2 \qquad p = 0.968$$

When considering in prevention of mosquito bite, gender has association between preventive behaviors against dengue infection in use mosquito net in the daytime among Family Health Leaders in this study (p = 0.007). Males had better preventive behavior than females. For using mosquito coil, females had better behavior (p = 0.036), as shown in Table 17. Use of insecticide spray and community-level cooperation against dengue infection had no clear association with gender (p ≥ 0.116, see Table 1, 2 in Appendix F).

Table 17: Association between gender and preventive behaviors against dengue infection in prevention of mosquito bite

| Preventive behaviors regarding Mosquito bite | Gender | | | | | |
|---|---|---|---|---|---|---|
| | Male | | Female | | Total | |
| | No. | % | No. | % | No. | % |
| Use mosquito net in the daytime | | | | | | |
| Poor | 57 | 50.0 | 192 | 64.4 | 249 | 60.4 |
| Good | 57 | 50.0 | 106 | 35.6 | 163 | 39.6 |
| Total | 114 | 100.0 | 298 | 100.0 | 412 | 100.0 |
| $X^2$ = 7.180 | | df = 1 | | p = 0.007 | | |
| Use mosquito coil | | | | | | |
| Poor | 53 | 46.5 | 105 | 35.2 | 158 | 38.3 |
| Good | 61 | 53.5 | 193 | 64.8 | 254 | 61.7 |
| Total | 114 | 100.0 | 298 | 100.0 | 412 | 100.0 |
| $X^2$ = 4.419 | | df = 1 | | p = 0.036 | | |

As shown in Table 18, there was no clear association of age with preventive behaviors against dengue infection in controlling breeding places (p = 0.140).

Similarly, age was not associated with prevention of mosquito bites or with community-level dengue prevention (p≥0.264, see Table 3, 4 in Appendix F).

**Table 18:** Association between age and preventive behaviors against dengue infection in controlling breeding places.

| Preventive behavior regarding breeding places | Age (year) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ≤ 35 years | | 36 - 45 | | 46 - 55 | | ≥ 56 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Poor | 37 | 48.7 | 55 | 40.7 | 37 | 34.9 | 45 | 47.4 | 174 | 42.2 |
| Fair | 16 | 21.1 | 33 | 24.4 | 38 | 35.8 | 28 | 29.5 | 115 | 27.9 |
| Good | 23 | 30.3 | 47 | 34.8 | 31 | 29.2 | 22 | 23.2 | 123 | 29.9 |
| Total | 76 | 100.0 | 135 | 100.0 | 106 | 100.0 | 95 | 100.0 | 412 | 100.0 |
| | $X^2 = 9.656$ | | | df = 6 | | | p = 0.140 | | | |

There was a marginally statistically significant association of marital status with prevention of breeding places (p = 0.059). Specifically, subjects who were separated, divorced, or widowed had lower behavior score than other subjects (Table 19). Similarly, separated/divorced/widowed subjects had marginally significantly lower use of mosquito nets in the daytime than other subjects (p=0.094, Table 20). There were no clear associations between marital status and other preventive behaviors (p≥0.269, see Table 5, 6 in Appendix F).

**Table 19:** Association between marital status and preventive behaviors against

dengue infection in controlling breeding places.

| Preventive behavior regarding breeding places | Marital status | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Single | | Married | | Separated/ widowed /divorced | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 22 | 56.4 | 129 | 39.8 | 23 | 46.9 | 174 | 42.2 |
| Fair | 5 | 12.8 | 93 | 28.7 | 17 | 34.7 | 115 | 27.9 |
| Good | 12 | 30.8 | 102 | 31.5 | 9 | 18.4 | 123 | 29.9 |
| Total | 39 | 100.0 | 324 | 100.0 | 49 | 100.0 | 412 | 100.0 |

$X^2 = 9.088$ \qquad df = 4 \qquad p = 0.059

**Table 20:** Association between marital status and preventive behaviors against

dengue infection in use net in the daytime.

| Preventive behavior | Marital status | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Single | | Married | | Separated/ widowed /divorced | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 19 | 48.7 | 195 | 60.2 | 35 | 71.4 | 249 | 60.4 |
| Good | 20 | 51.3 | 129 | 39.8 | 14 | 28.6 | 163 | 39.6 |
| Total | 39 | 100.0 | 324 | 100.0 | 49 | 100.0 | 412 | 100.0 |

$X^2 = 4.724$ \qquad df = 2 \qquad p = 0.094

Educational level was not clearly associated with prevention of breeding

places (p = 0.118, Table 21). When considering prevention of mosquito bite, there

were marginally statistically significant in association between education and use net

in the daytime (p = 0.058, Table 22). For use mosquito coil, education also had an

association with preventive behavior (p = 0.043, Table 22). Using insecticide spray had no association with education (p = 0.462, Table 22). For these behaviors, Family Health Leaders who had high education had better preventive behavior than those with low education, as shown in Table 22. Community-level cooperation against dengue infection had no association with education (p≥0.499, see Table 7 in Appendix F).

**Table 21:** Association between education and preventive behaviors against dengue infection in controlling breeding places.

| Preventive behaviors regarding Breeding places | Education | | | | | |
|---|---|---|---|---|---|---|
| | Primary school | | Higher than Primary school | | Total | |
| | No. | % | No. | % | No. | % |
| Poor | 140 | 40.5 | 34 | 51.5 | 174 | 42.2 |
| Fair | 103 | 29.8 | 12 | 18.2 | 115 | 27.9 |
| Good | 103 | 29.8 | 20 | 30.3 | 123 | 29.9 |
| Total | 346 | 100.0 | 66 | 100.0 | 412 | 100.0 |

$X^2 = 4.275$ df = 2 p = 0.118

**Table 22:** Association between education and preventive behaviors against dengue

infection in prevention of mosquito bite

| Preventive behaviors regarding mosquito bite | Education | | | | | |
|---|---|---|---|---|---|---|
| | Primary school | | Higher than Primary school | | Total | |
| | No. | % | No. | % | No. | % |
| Use net in the daytime | | | | | | |
| Poor | 216 | 62.4 | 33 | 50.0 | 249 | 60.4 |
| Good | 130 | 37.6 | 33 | 50.0 | 163 | 39.6 |
| Total | 346 | 100.0 | 66 | 100.0 | 412 | 100.0 |
| $X^2 = 3.580$ | | | df = 1 | | p = 0.058 | |
| Use insecticide spray | | | | | | |
| Poor | 276 | 79.8 | 50 | 75.8 | 326 | 79.1 |
| Good | 70 | 20.2 | 16 | 24.2 | 86 | 20.9 |
| Total | 346 | 100.0 | 66 | 100.0 | 412 | 100.0 |
| $X^2 = 0.540$ | | | df = 1 | | p = 0.462 | |
| Use mosquito coil | | | | | | |
| Poor | 140 | 40.5 | 18 | 27.3 | 158 | 38.3 |
| Good | 206 | 59.5 | 48 | 72.7 | 254 | 61.7 |
| Total | 346 | 100.0 | 66 | 100.0 | 412 | 100.0 |
| $X^2 = 4.048$ | | | df = i | | p = 0.043 | |

Respondents in agricultural occupations had marginally significantly better preventive behavior regarding breeding places than did other subjects (p=0.062, Table 23). Preventive behaviors against dengue infection in prevention of mosquito bite and cooperation against dengue infection had no clear association with occupation (p≥0.222, see Table 8, 9 in Appendix F).

**Table 23:** Association between occupation and preventive behaviors against dengue
infection in controlling breeding places.

| Preventive behavior regarding breeding places | Occupation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Agricultural | | Commercial/ business | | Others | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 101 | 37.1 | 32 | 55.2 | 41 | 50.0 | 174 | 42.2 |
| Fair | 83 | 30.5 | 12 | 20.7 | 20 | 24.4 | 115 | 27.9 |
| Good | 88 | 32.4 | 14 | 24.1 | 21 | 25.6 | 123 | 29.9 |
| Total | 272 | 100.0 | 58 | 100.0 | 82 | 100.0 | 412 | 100.0 |
| | $X^2 = 8.953$ | | df = 4 | | p = 0.062 | | | |

From the results of association between household income and preventive behaviors against dengue infection in controlling breeding places among Family Health Leaders found that there were not significant in association due to p = 0.145 mean Family Health Leaders who had high or low household income did not different in preventive behaviors against dengue infection (Table 24).

**Table 24:** Association between household income and preventive behaviors against

dengue infection in controlling breeding places.

| Preventive behavior regarding breeding places | Household income (Baht per month) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ≤ 2,500 | | 2,501 – 4,000 | | 4,001 – 6,000 | | ≥ 6,001 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Poor | 45 | 48.4 | 58 | 47.2 | 45 | 39.8 | 26 | 31.3 | 174 | 42.2 |
| Fair | 28 | 30.1 | 29 | 23.6 | 30 | 26.5 | 28 | 33.7 | 115 | 27.9 |
| Good | 20 | 21.5 | 36 | 29.3 | 38 | 33.6 | 29 | 34.9 | 123 | 29.9 |
| Total | 93 | 100.0 | 123 | 100.0 | 113 | 100.0 | 83 | 100.0 | 412 | 100.0 |
| | $X^2 = 9.549$ | | | df = 6 | | | p = 0.145 | | | |

When considering prevention of mosquito bite, household income has association between preventive behaviors against dengue infection in use mosquito net in daytime among Family Health Leaders in this study (p = 0.001, Table 25). For use insecticide spray, household income levels have the different preventive behaviors. Family Health Leaders who have high household income, had better preventive behavior than did Family Health Leaders with lower income (p = 0.003, Table 25). For using mosquito coil, household income had association with preventive behaviors against dengue infection (p = 0.005), as shown in Table 25. Generally, better behavior regarding bite prevention was associated with higher income. Community-level cooperation against dengue infection had no significant association with household income (p ≥0.169, see Table 10 in Appendix F).

**Table 25:** Association between household income and preventive behaviors against

dengue infection in prevention of mosquito bite

| Preventive behavior regarding mosquito bite | Household income (Baht per month) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ≤ 2,500 | | 2,501 – 4,000 | | 4,001 – 6,000 | | ≥ 6,001 | | Total | |
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Use mosquito net in daytime | | | | | | | | | | |
| Poor | 64 | 68.8 | 69 | 56.1 | 55 | 48.7 | 61 | 73.5 | 249 | 60.4 |
| Good | 29 | 31.2 | 54 | 43.9 | 58 | 51.3 | 22 | 26.6 | 163 | 39.6 |
| Total | 93 | 100.0 | 123 | 100.0 | 113 | 100.0 | 83 | 100.0 | 412 | 100.0 |
| | $X^2$ = 16.159 | | | | df = 3 | | | p = 0.001 | | |
| Use insecticide spray | | | | | | | | | | |
| Poor | 86 | 92.5 | 95 | 77.2 | 85 | 75.2 | 60 | 72.3 | 326 | 79.1 |
| Good | 7 | 7.5 | 28 | 22.8 | 28 | 24.8 | 23 | 27.7 | 86 | 20.9 |
| Total | 93 | 100.0 | 123 | 100.0 | 113 | 100.0 | 83 | 100.0 | 412 | 100.0 |
| | $X^2$ = 13.689 | | | | df = 3 | | | p = 0.003 | | |
| Use mosquito coil | | | | | | | | | | |
| Poor | 39 | 41.9 | 58 | 47.2 | 42 | 37.2 | 19 | 22.9 | 158 | 38.3 |
| Good | 54 | 58.1 | 65 | 52.8 | 71 | 62.8 | 64 | 77.1 | 254 | 61.7 |
| Total | 93 | 100.0 | 123 | 100.0 | 113 | 100.0 | 83 | 100.0 | 412 | 100.0 |
| | $X^2$ = 12.994 | | | | df = 3 | | | p = 0.005 | | |

There was no clear association of family size with prevention of breeding places (p=0.133, see Table 11 in Appendix F). When considering prevention of mosquito bite, family size had association with using mosquito net in daytime among Family Health Leaders (p = 0.005, Table 26). A large family had preventive behavior against dengue infection more than a small family, as shown in Table 26. For use

mosquito coil had marginally significant association with family size (p = 0.096, Table 26) meaning that family size had a different preventive behaviors. A large family had preventive behavior against dengue infection more than a small family. For using insecticide pray had no association with family size (p = 0.820, Table 26). Community cooperation against dengue infection had no association with family size (p ≥ 0.575, see Table 12 in Appendix F).

**Table 26:** Association between family size and preventive behaviors against dengue infection in prevention of mosquito bite

| Preventive behavior of mosquito bite | Family size | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ≤ 2 | | 3 | | ≥ 4 | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Use net in daytime | | | | | | | | |
| Poor | 104 | 68.0 | 77 | 63.1 | 68 | 49.6 | 246 | 60.4 |
| Good | 49 | 32.0 | 45 | 36.9 | 69 | 50.4 | 163 | 39.4 |
| Total | 153 | 100.0 | 122 | 100.0 | 137 | 100.0 | 412 | 100.0 |
| | $X^2 = 10.686$ | | df = 2 | | p = 0.005 | | | |
| Use insecticide spray | | | | | | | | |
| Poor | 122 | 79.9 | 98 | 80.3 | 106 | 77.4 | 326 | 79.1 |
| Good | 31 | 20.3 | 24 | 17.7 | 31 | 22.6 | 86 | 20.9 |
| Total | 153 | 100.0 | 122 | 100.0 | 137 | 100.0 | 412 | 100.0 |
| | $X^2 = 0.397$ | | df = 2 | | p = 0.820 | | | |
| Use mosquito coil | | | | | | | | |
| Poor | 69 | 45.1 | 42 | 34.4 | 47 | 34.3 | 158 | 38.3 |
| Good | 84 | 54.9 | 80 | 65.6 | 90 | 65.7 | 254 | 61.7 |
| Total | 153 | 100.0 | 122 | 100.0 | 137 | 100.0 | 412 | 100.0 |
| | $X^2 = 4.689$ | | df = 2 | | p = 0.096 | | | |

From the results of association between dengue history and preventive behaviors against dengue infection in controlling breeding places among Family Health Leaders found that there were not significant in association (p = 0.914), as shown in Table 27. Similarly, family dengue history was not associated with prevention of mosquito bite or community cooperation against dengue infection (p≥ 0.236, see Table 13, 14 in Appendix F). This indicates that dengue history was not an important confounder in this analysis.

Table 27: Association between dengue history and preventive behaviors against dengue infection in controlling breeding places.

| Preventive behaviors regarding breeding places | Dengue history in family | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Never got | | Ever got | | Total | |
| | No. | % | No. | % | No. | % |
| Poor | 158 | 42.2 | 16 | 41.0 | 174 | 42.2 |
| Fair | 103 | 27.6 | 12 | 30.8 | 115 | 27.9 |
| Good | 112 | 30.0 | 11 | 28.2 | 123 | 29.9 |
| Total | 373 | 100.0 | 39 | 100.0 | 412 | 100.0 |

$$X^2 = 0.180 \qquad df = 2 \qquad p = 0.914$$

### 3. Relationships of predisposing factors with preventive behaviors.

Predisposing factors were knowledge and attitude regarding dengue prevention. Knowledge had a significant positive association with attitude (p < 0.001 by chi-square) meaning that Family Health Leaders who had high knowledge about dengue infection tended to have good attitude on preventive behaviors against dengue infection, as shown in Table 28.

**Table 28:** Association between knowledge and attitude regarding prevention of

dengue infection.

| Attitude towards dengue infection | Knowledge | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 19 | 23.2 | 27 | 15.9 | 9 | 5.6 | 55 | 13.3 |
| Fair | 56 | 68.3 | 103 | 60.6 | 68 | 42.5 | 227 | 55.1 |
| Good | 7 | 8.5 | 40 | 23.5 | 83 | 51.9 | 130 | 31.6 |
| Total | 82 | 100.0 | 170 | 100.0 | 160 | 100.0 | 412 | 100.0 |
| | $X^2 = 60.200$ | | df = 4 | | p<0.001 | | | |

When scores were considered as continuous variables, knowledge and attitude

were also positively and significantly associated (r = 0.370, p<0.001 by correlation

analysis), as shown in Table 29.

**Table 29:** Correlation of total knowledge score with attitude towards dengue

infection score among Family Health Leaders.

| Variables | Knowledge | |
|---|---|---|
| | r | p |
| Attitude towards dengue infection | 0.370 | <0.001 |

Knowledge had marginally statistically significant association with preventive

behaviors in controlling breeding places among Family Health Leaders (p = 0.051)

meaning that Family Health Leaders who had high knowledge about dengue infection

tended to have good preventive behaviors against dengue infection, as shown in Table 30

**Table 30:** Association between knowledge and preventive behaviors against dengue infection in controlling breeding places.

| Preventive behaviors regarding breeding places | Knowledge | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 31 | 56.4 | 91 | 40.1 | 52 | 40.0 | 174 | 42.2 |
| Fair | 17 | 30.9 | 62 | 27.3 | 36 | 27.7 | 115 | 27.9 |
| Good | 7 | 12.7 | 74 | 32.6 | 42 | 32.3 | 123 | 29.9 |
| Total | 55 | 100.0 | 227 | 100.0 | 130 | 100.0 | 412 | 100.0 |

$$X^2 = 9.449 \qquad df = 4 \qquad p = 0.051$$

When considering prevention of mosquito bite, knowledge had association with using net in the daytime, and using insecticide spray (p = 0.094 and 0.037) meaning that Family Health Leaders who had low knowledge about dengue infection used net in the daytime and used insecticide spray less than those who had moderate or high knowledge, as shown in Table 31. Community-level cooperation fogging spray had marginally statistically significant association with knowledge (p = 0.078, Table 32). For using mosquito coil and community-level cooperation against dengue infection campaign, there were no significant associations with knowledge ($p \geq 0.182$) (see Table 15, 16 in Appendix F).

**Table 31:** Association between knowledge and preventive behaviors against dengue

infection in prevention of mosquito bite

| Preventive behaviors regarding mosquito bite | Knowledge | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Use net in the daytime | | | | | | | | |
| Poor | 33 | 60.0 | 147 | 64.8 | 69 | 53.1 | 249 | 60.4 |
| Good | 22 | 40.0 | 80 | 35.2 | 61 | 46.9 | 163 | 39.6 |
| Total | 55 | 100.0 | 227 | 1000 | 130 | 100.0 | 412 | 100.0 |
| $X^2 = 4.722$ | | | df = 2 | | p = 0.094 | | | |
| Use insecticide spray | | | | | | | | |
| Poor | 49 | 89.1 | 170 | 74.9 | 107 | 82.3 | 326 | 79.1 |
| Good | 6 | 10.9 | 57 | 25.1 | 23 | 17.7 | 86 | 20.9 |
| Total | 55 | 100.0 | 227 | 1000 | 130 | 100.0 | 412 | 100.0 |
| $X^2 = 6.570$ | | | df = 2 | | p = 0.037 | | | |

**Table 32:** Association between knowledge and community-level cooperation against

dengue infection

| Preventive behavior | Knowledge | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Cooperation in community-level fogging spray | | | | | | | | |
| Poor | 9 | 16.4 | 16 | 7.0 | 10 | 7.7 | 35 | 8.5 |
| Good | 46 | 83.6 | 211 | 93.0 | 120 | 92.3 | 377 | 91.5 |
| Total | 55 | 100.0 | 227 | 1000 | 130 | 100.0 | 412 | 100.0 |
| $X^2 = 5.100$ | | | df = 2 | | p = 0.078 | | | |

Attitude had no association between preventive behaviors against dengue infection in controlling breeding places among Family Health Leaders in this study (p = 0.284), as shown in Table 33.

**Table 33:** Association between attitude and preventive behaviors against dengue infection in controlling breeding places.

| Preventive behaviors regarding breeding places | Attitude | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 32 | 39.0 | 77 | 45.3 | 65 | 40.6 | 174 | 42.2 |
| Fair | 20 | 24.4 | 52 | 30.6 | 43 | 26.9 | 115 | 27.9 |
| Good | 30 | 36.6 | 41 | 24.1 | 52 | 32.5 | 123 | 29.9 |
| Total | 82 | 100.0 | 170 | 100.0 | 160 | 100.0 | 412 | 100.0 |

$$X^2 = 5.031 \qquad df = 4 \qquad p = 0.284$$

When considering prevention of mosquito bite, attitude had a significant association with using mosquito net in daytime (p = 0.032), and marginally significant associations with using insecticide and using mosquito coil (p = 0.082 and 0.073, respectively), meaning that Family Health Leaders who had better attitude about dengue infection used mosquito nets in daytime, used insecticide spray, and used mosquito coil more than did those with poorer attitude about dengue infection, as shown in Table 34.

**Table 34:** Association between attitude and preventive behaviors against dengue

infection in prevention of mosquito bite.

| Preventive behaviors regarding mosquito bite | Attitude | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Use net in the daytime | | | | | | | | |
| Poor | 54 | 65.9 | 111 | 65.3 | 84 | 52.5 | 249 | 60.4 |
| Good | 28 | 34.1 | 59 | 34.7 | 76 | 47.5 | 163 | 39.6 |
| Total | 82 | 100.0 | 170 | 100.0 | 160 | 100.0 | 412 | 100.0 |
| | $X^2 = 6.899$ | | df = 2 | | p = 0.032 | | | |
| Use insecticide spray | | | | | | | | |
| Poor | 72 | 87.7 | 133 | 78.2 | 121 | 75.6 | 326 | 79.1 |
| Good | 10 | 12.2 | 37 | 21.8 | 39 | 24.4 | 86 | 20.9 |
| Total | 82 | 100.0 | 170 | 100.0 | 160 | 100.0 | 412 | 100.0 |
| | $X^2 = 5.009$ | | df = 2 | | p = 0.082 | | | |
| Use mosquito coil | | | | | | | | |
| Poor | 40 | 48.8 | 64 | 37.6 | 54 | 33.8 | 158 | 38.3 |
| Good | 42 | 51.2 | 106 | 62.4 | 106 | 66.3 | 254 | 61.7 |
| Total | 82 | 100.0 | 170 | 100.0 | 160 | 100.0 | 412 | 100.0 |
| | $X^2 = 5.241$ | | df = 2 | | p = 0.073 | | | |

For community-level cooperation against dengue infection, attitude had a marginally significant positive association with fogging spraying (p=0.058), and a highly significant positive association with cooperating in campaigns (p<0.001), meaning that Family Health Leaders who had better attitude about dengue infection were more cooperative than those with poorer attitudes (Table 35).

**Table 35:** Association between attitude and preventive behaviors against dengue

infection in community cooperation against dengue infection.

| Community cooperation against dengue infection | Attitude | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Cooperation in fogging spray | | | | | | | | |
| Poor | 12 | 14.6 | 14 | 8.2 | 9 | 5.6 | 35 | 8.5 |
| Good | 70 | 85.4 | 156 | 91.8 | 151 | 94.4 | 377 | 91.5 |
| Total | 82 | 100.0 | 170 | 100.0 | 160 | 100.0 | 412 | 100.0 |
| $X^2 = 5.686$ | | | df = 2 | | | p = 0.058 | | |
| Cooperation in campaign | | | | | | | | |
| Poor | 29 | 35.4 | 68 | 40.0 | 32 | 20.0 | 129 | 31.3 |
| Good | 53 | 64.6 | 102 | 60.0 | 128 | 80.0 | 283 | 68.7 |
| Total | 82 | 100.0 | 170 | 100.0 | 160 | 100.0 | 412 | 100.0 |
| $X^2 = 16.112$ | | | df = 2 | | | p < 0.001 | | |

Knowledge, attitude, and preventive behavior regarding breeding places were also treated as continuous variables, and correlation coefficients were computed. Knowledge about dengue infection had significant positive correlation with controlling breeding places (r = 0.164, p = 0.001), meaning Family Health Leaders had high knowledge on dengue infection and good preventive behaviors against dengue infection also. In contrast, attitude showed no correlation with breeding place prevention (r = - 0.006, p = 0.911), as shown in Table 36. Thus, there was consistency between chi-square testing and correlation analysis regarding relationships of knowledge and attitude with breeding place prevention. This suggests that there was no major bias due to the choice of cut-points for categorizing knowledge and attitude.

**Table 36:** Correlations of total score for controlling breeding places with total

knowledge score, and with total attitude score, among family health

leaders.

| Variables | Preventive behaviors against dengue infection | |
|-----------|:---:|:---:|
| | r | p |
| Knowledge | 0.164 | 0.001 |
| Attitude | - 0.006 | 0.911 |

## 4. Relationship of enabling factors with preventive behaviors.

Four items were assessed in considering relationships of sufficiency of resources with preventive behaviors. Distributions of these are given in table 9 above. All respondents had mosquito nets with good condition, so this resource could not be analyzed. Having water container covers was positively associated with controlling breeding places (p=0.017). Having temephos sand throughout the year was not associated with controlling breeding places (p=0.612). Having "other resources" was also positively associated with controlling breeding places (p=0.046). Overall, sufficient resources were associated with better behaviors in preventing breeding places, as shown in Table 37.

**Table 37:** Association between sufficiency of resources and preventive behaviors

against dengue infection in controlling breeding places.

| Preventive behaviors | Sufficiency of resources | | | | | |
| regarding breeding | Insufficiency | | Sufficiency | | Total | |
| places | No. | % | No. | % | No. | % |
|---|---|---|---|---|---|---|
| Water container covers | | | | | | |
| Poor | 117 | 41.8 | 57 | 43.2 | 174 | 42.2 |
| Fair | 89 | 31.8 | 26 | 19.7 | 115 | 27.9 |
| Good | 74 | 26.4 | 49 | 37.1 | 123 | 29.9 |
| Total | 280 | 100.0 | 132 | 100.0 | 412 | 100.0 |
| $X^2 = 8.174$ | | df = 2 | | p = 0.017 | | |
| Temephos sand | | | | | | |
| Poor | 36 | 45.6 | 138 | 41.4 | 174 | 42.2 |
| Fair | 23 | 29.1 | 92 | 27.6 | 115 | 27.9 |
| Good | 20 | 25.3 | 103 | 30.9 | 123 | 29.9 |
| Total | 79 | 100.0 | 333 | 100.0 | 412 | 100.0 |
| $X^2 = 0.982$ | | df = 2 | | p = 0.612 | | |
| Other resources | | | | | | |
| Poor | 74 | 48.7 | 100 | 38.5 | 174 | 42.2 |
| Fair | 43 | 28.3 | 72 | 27.7 | 115 | 27.9 |
| Good | 35 | 23.0 | 88 | 33.8 | 123 | 29.9 |
| Total | 152 | 100.0 | 260 | 100.0 | 412 | 100.0 |
| $X^2 = 6.147$ | | df = 2 | | p = 0.046 | | |

When considering sufficiency of resources, use net in the daytime, and use insecticide spray had a marginally significant association with sufficiency of water container covers (p =0.058, and 0.094, respectively). For use mosquito coil had no association with sufficiency of water container covers (p=0.316), as shown in Table 38. Sufficiency of water container covers had no association with community-level

cooperation against dengue infection (p=0.879, Table 17 in Appendix F). Sufficiency of temephos sand had no association with prevention of mosquito bite and community-level cooperation against dengue infection (p≥0.226, Table 18 and 19 in Appendix F).

**Table 38:** Association between sufficiency of water container covers and preventive behaviors against dengue infection in prevention of mosquito bite

| Preventive behavior regarding Mosquito bite | Sufficiency of water container covers | | | | | |
|---|---|---|---|---|---|---|
| | Insufficiency | | Sufficiency | | Total | |
| | No. | % | No. | % | No. | % |
| Use net in the daytime | | | | | | |
| Poor | 178 | 63.6 | 71 | 53.8 | 249 | 60.4 |
| Good | 102 | 36.4 | 61 | 46.2 | 163 | 39.6 |
| Total | 280 | 100.0 | 132 | 100.0 | 412 | 100.0 |
| $X^2 = 3.591$ | | df = 1 | | p = 0.058 | | |
| Use insecticide spray | | | | | | |
| Poor | 228 | 81.4 | 98 | 74.2 | 326 | 79.1 |
| Good | 52 | 18.6 | 34 | 25.8 | 86 | 20.9 |
| Total | 280 | 100.0 | 132 | 100.0 | 412 | 100.0 |
| $X^2 = 2.805$ | | df = 1 | | p = 0.094 | | |
| Use mosquito coil | | | | | | |
| Poor | 112 | 40.0 | 46 | 34.8 | 158 | 38.3 |
| Good | 168 | 60.0 | 86 | 65.2 | 254 | 61.7 |
| Total | 280 | 100.0 | 132 | 100.0 | 412 | 100.0 |
| $X^2 = 1.007$ | | df = 1 | | p = 0.316 | | |

For prevention of mosquito bite, using mosquito coil had a strong significant association with sufficiency of other resources (p<0.001), as shown in Table 39.

However, sufficiency of other resources had no association with other prevention of

mosquito bite and community-level cooperation in fogging spray (p≥0.152, Table 20,

21 in Appendix F)


**Table 39:** Association between sufficiency of other resources and preventive

behaviors against dengue infection in prevention of mosquito bite

| Preventive behavior regarding Mosquito bite | Sufficiency of other resources | | | | | |
|---|---|---|---|---|---|---|
| | Insufficiency | | Sufficiency | | Total | |
| | No. | % | No. | % | No. | % |
| Use mosquito coil | | | | | | |
| Poor | 75 | 49.3 | 83 | 31.9 | 158 | 38.3 |
| Good | 77 | 50.7 | 177 | 68.1 | 254 | 61.7 |
| Total | 152 | 100.0 | 260 | 100.0 | 412 | 100.0 |
| $X^2 = 12.310$ | | df = 1 | | p < 0.001 | | |


Community-level cooperation against dengue infection, sufficiency of other

resources had a significant association with against dengue infection campaign

(p=0.003, Table 40).


**Table 40:** Association between sufficiency of other resources and community-level

cooperation against dengue infection

| Preventive behavior | Sufficiency of other resources | | | | | |
|---|---|---|---|---|---|---|
| | Insufficiency | | Sufficiency | | Total | |
| | No. | % | No. | % | No. | % |
| Cooperation in community-level dengue infection campaign | | | | | | |
| Poor | 61 | 40.1 | 68 | 26.2 | 129 | 31.3 |
| Good | 91 | 59.9 | 192 | 73.8 | 283 | 68.7 |
| Total | 152 | 100.0 | 260 | 100.0 | 412 | 100.0 |
| $X^2 = 8.714$ | | df = 1 | | p = 0.003 | | |

## 5. Relationship of reinforcing factors with preventive behaviors.

Reinforcing factors consisted of frequency with which subjects received information about dengue infection, and the number of sources from which they received such information. Frequency of receiving information was strongly positively associated with better control of breeding places (p < 0.001), as shown in Table 41

**Table 41:** Association between receiving information and preventive behaviors against dengue infection in controlling breeding places.

| Preventive Behaviors Regarding breeding places | Receiving information (frequency) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 66 | 68.0 | 64 | 39.8 | 44 | 28.6 | 174 | 42.2 |
| Fair | 27 | 27.8 | 45 | 28.0 | 43 | 27.9 | 115 | 27.9 |
| Good | 4 | 4.1 | 52 | 32.3 | 67 | 43.5 | 123 | 29.9 |
| Total | 97 | 100.0 | 161 | 100.0 | 154 | 100.0 | 412 | 100.0 |

$$X^2 = 53.786 \qquad df = 4 \qquad p < 0.001$$

Frequency of receiving information was also positively associated with use of mosquito coils (p=0.024) and marginally significant associated with use insecticide spray (p=0.100) However, frequency of receiving information was not clearly associated with use net in the daytime (p=0.309), as shown in Table 42.

**Table 42:** Association between receiving information and preventive behavior against

dengue infection in prevention of mosquito bite

| Preventive behaviors regarding mosquito bite | Receiving information (frequency) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Use net in the daytime | | | | | | | | |
| Poor | 65 | 67.0 | 93 | 57.8 | 91 | 59.1 | 249 | 60.4 |
| Good | 32 | 33.0 | 68 | 42.2 | 63 | 40.9 | 163 | 39.6 |
| Total | 97 | 100.0 | 161 | 100.0 | 154 | 100.0 | 412 | 100.0 |
| | $X^2$ =2.351 | | df = 2 | | p = 0.309 | | | |
| Use insecticide spray | | | | | | | | |
| Poor | 74 | 76.3 | 136 | 84.5 | 116 | 75.3 | 326 | 79.1 |
| Good | 23 | 23.7 | 25 | 15.5 | 38 | 24.7 | 86 | 20.9 |
| Total | 97 | 100.0 | 161 | 100.0 | 154 | 100.0 | 412 | 100.0 |
| | $X^2$ = 4.606 | | df = 2 | | p = 0.100 | | | |
| Use mosquito coil | | | | | | | | |
| Poor | 48 | 49.5 | 60 | 37.3 | 50 | 32.5 | 158 | 38.3 |
| Good | 49 | 50.5 | 101 | 62.7 | 104 | 67.5 | 254 | 61.7 |
| Total | 97 | 100.0 | 161 | 100.0 | 154 | 100.0 | 412 | 100.0 |
| | $X^2$ = 7.420 | | df = 2 | | p = 0.024 | | | |

For community-level cooperation against dengue infection, frequency of

receiving information was strongly positively associated with cooperation in fogging

spraying and community campaigns (p<0.001 and p=0.022, respectively), as shown in

Table 43.

**Table 43:** Association between frequency of receiving information and community-

level cooperation against dengue infection.

| Preventive behaviors in cooperation against dengue infection | Frequency of receiving information | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low | | Moderate | | High | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Cooperation in community-level fogging spray | | | | | | | | |
| Poor | 18 | 18.6 | 9 | 5.6 | 8 | 5.2 | 35 | 8.5 |
| Good | 79 | 81.4 | 152 | 94.4 | 146 | 94.8 | 377 | 91.5 |
| Total | 97 | 100.0 | 161 | 100.0 | 154 | 100.0 | 412 | 100.0 |
| $X^2 = 16.538$ | | | df = 2 | | | p< 0.001 | | |
| Cooperation in community-level dengue prevention campaign | | | | | | | | |
| Poor | 41 | 42.3 | 48 | 29.8 | 40 | 26.0 | 129 | 31.3 |
| Good | 56 | 57.7 | 113 | 70.2 | 114 | 74.0 | 283 | 68.7 |
| Total | 97 | 100.0 | 161 | 100.0 | 154 | 100.0 | 412 | 100.0 |
| $X^2 = 7.622$ | | | df = 2 | | | p = 0.022 | | |

When scores were considered as continuous variables, frequency of receiving information about dengue infection had significant positive correlation with controlling breeding places (r = 0.361, p< 0.001), meaning Family Health Leaders with higher information frequency had better preventive behaviors in this regard.

Number of information sources about dengue infection in the last year and preventive behaviors against dengue infection in controlling breeding places among Family Health Leaders had a strong significant positive association (p<0.001), as shown in Table 44.

**Table 44:** Association between number of information sources and preventive behaviors against dengue infection in controlling breeding places.

| Preventive behaviors regarding breeding places | Number of sources of information | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2-4 | | 5-7 | | 8-9 | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Poor | 54 | 62.1 | 90 | 41.3 | 30 | 28.0 | 174 | 42.2 |
| Fair | 26 | 29.9 | 70 | 32.1 | 19 | 17.8 | 115 | 27.9 |
| Good | 7 | 8.0 | 58 | 26.6 | 58 | 54.2 | 123 | 29.9 |
| Total | 87 | 100.0 | 218 | 100.0 | 107 | 100.0 | 412 | 100.0 |
| | $X^2 = 54.592$ | | df = 4 | | p< 0.001 | | | |

When considering in prevention of mosquito bite and number of information sources in the last year, there were not significant in association ($p \geq 0.170$, Table 22 in Appendix F). For cooperation against dengue infection, number of information sources had positive associations with fogging spray and community campaigns (p = 0.043 and p<0.001, respectively), as shown in Table 45.

**Table 45:** Association between number of anti-dengue information sources and

community-level cooperation against dengue infection.

| Preventive behaviors in cooperation against dengue infection | Number of sources accessed information | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2-4 | | 5-7 | | 8-9 | | Total | |
| | No. | % | No. | % | No. | % | No. | % |
| Cooperation in fogging spray | | | | | | | | |
| Poor | 8 | 9.2 | 24 | 11.0 | 3 | 2.8 | 35 | 8.5 |
| Good | 79 | 90.8 | 194 | 89.0 | 104 | 97.2 | 377 | 91.5 |
| Total | 87 | 100.0 | 218 | 100.0 | 107 | 100.0 | 412 | 100.0 |
| | $X^2 = 6.286$ | | df $= 2$ | | p $= 0.043$ | | | |
| Cooperation in campaign | | | | | | | | |
| Poor | 36 | 41.4 | 84 | 38.5 | 9 | 8.4 | 129 | 31.3 |
| Good | 51 | 58.6 | 134 | 61.5 | 98 | 91.6 | 283 | 68.7 |
| Total | 87 | 100.0 | 218 | 100.0 | 107 | 100.0 | 412 | 100.0 |
| | $X^2 = 35.476$ | | df $= 2$ | | p$<$0.001 | | | |