

## **CHAPTER IV**

### **RESULTS**

This chapter presents the results for the dengue hemorrhagic fever (DHF)-prevention and -control behavior levels among the family health leaders, and the relationships between predisposing, reinforcing, and enabling factors. The study population was 400 family health leaders in Tamode District, Phatthalung Province. The data were collected by self-administered questionnaire, from 1 April 2004 to 15 June 2004, which was in mid-summer and the rainy season in Thailand, when the prevalence of DHF is normally high.

#### **Part 1. General Socio-demographic Characteristics**

**The socio-demographic characteristics of the sample group** consisted of gender, age, marital status, religion, education level, occupation, income, number of family members, and training in public health services.

Gender: 62.2% of the study group was female and 37.8% male. 32.0% were aged 36-45 years and 29.5% 26-35 years. For marital status, 70.3% were married/couples and 25.0% were single. Most members of the study group were Buddhist (55.5%), while 44.5% were Muslim. For occupation, most worked in agriculture (59.8%), and 14.3% were employees. Most (48.0%) had incomes of 3,001-6,000 Baht/month, and 21.0% 6,001-9,000 Baht/month. Most families had 1-4

members (53.5%), with 43.75% having 5-8 members. Most families had children aged < 15 years (73.0%). 67.8% of the family health leaders had attended a seminar about public health activities (Table 1).

**Table 1: Number and percentage of family health leaders, by demographic characteristics.**

Demographic characteristics		Number (N=400)	Percentage (100.0)
Gender	Males	151	37.8
	Females	249	62.2
Age	< 17 years	31	7.8
	18 – 25 years	62	15.5
	26 – 35 years	118	29.5
	36 – 45 years	128	32.0
	46 – 55 years	46	11.5
	56 – 65 years	13	3.3
	> 65 years	2	0.5
	$\bar{X} = 34.35$	S.D. = 10.98	Min = 13
Marital status	Single	100	25.0
	Couple/Married	281	70.3
	Widowed/Divorced/Separated	19	4.8
Religion	Buddhism	222	55.5
	Islam (Muslim)	178	44.5
Education level	None	5	1.3
	Primary school (grades 1-6)	137	34.3
	Secondary school	80	20.0
	High school/Vocational education	117	29.3

**Table 1: (Cont.) Number and percentage of family health leaders, by demographic characteristics.**

<b>Demographic characteristics</b>		<b>Number (N=400)</b>	<b>Percentage (100.0)</b>
Education level	Diploma/High vocational education	23	5.8
	Bachelor or equivalent	33	8.3
	Other	5	1.3
Occupation	Agriculture	239	59.8
	Employed	57	14.3
	Commerce	19	4.8
	Housewife	15	3.8
	Official/Private sector	21	5.3
	Unemployed	18	4.5
	Other (student)	31	7.8
	Income	0-3,000 Baht/month	66
	3,001 – 6,000 Baht/month	192	48.0
	6,001 – 9,000 Baht/month	84	21.0
	9,001 – 12,000 Baht/month	27	6.8
	12,001 – 15,000 Baht/month	13	3.3
	>15,000 Baht/month	18	4.5
Family size	1 – 4 members	214	53.5
	5 – 8 members	175	43.7
	9 – 12 members	11	2.8
Family with children aged < 15 years	Yes	292	73.0
	No	108	27.0
Attended public health seminar	Yes	271	67.8
	No	129	32.2

## Part 2. Variables for predisposing, reinforcing & enabling factors, and DHF prevention/control behaviors

**Predisposing factors** consist of knowledge about DHF symptoms and attitude towards DHF, and attitude towards DHF-prevention/control behaviors.

According to the study, most of the sample group had high-level knowledge about the disease (79.0%), while knowledge about the DHF prevention/control was at a moderate level, at 21.0% (Table 2).

**Table 2: Number and percentage of family health leaders, by knowledge and understanding of dengue, and dengue prevention/control**

Knowledge level	Number (N=400)	Percent (100.0)
High (8-11 points)	316	79.0
Medium (4-7 points)	84	21.0
Low (0-3 points)	0	0
$\bar{X} = 8.73$	S.D. 1.48	Min = 4 Max = 11

It was found that knowledge among the sample group was as follows: 94.5% of the sample group knew that *Aedes* mosquitoes caused dengue symptoms (No. 1), 87.8% knew that the mosquitoes that caused dengue sought food during the daytime (No. 2), 67.8% of the sample group knew that children, from newborns to age 15 years, had a higher risk of contracting dengue than others (No. 5), 64.5% of the sample group knew that the mosquitoes that caused dengue normally laid their eggs in still water (No. 3),

whereas 34.0% of answered correctly about the symptoms of disease (No. 4), 93.8% knew how to prevent and eliminate mosquito-breeding areas, such as vases or other plant bowls, which needed to be drained every 7 days (No. 11), 91.8% knew how to prevent and eliminate breeding areas, especially in saucers, by using salt, detergent, vinegar, or Abate sand, which could kill mosquito larvae (No. 10), 88.8% knew how to prevent and eliminate mosquito-breeding areas in water storage in toilets or bathrooms by using Abate sand and regular cleaning the water containers every 7 days, which might eliminate mosquito larvae (No. 9), 83.% of the sample group knew how to prevent and eliminate mosquito-breeding areas in water containers by putting Abate sand and fish into water containers to kill mosquito larvae (No. 8), 86.5% knew that drinking-water containers needed to be properly covered to prevent and eliminate mosquito-breeding areas (No. 7), and 75.% answered correctly about how to prevent mosquito bite (No. 6) (Table 3).

**Table 3: Number and percentage of family health leaders who answered correctly about dengue and dengue prevention/control**

<b>Knowledge/ understanding of DHF and DHF prevention/control</b>	<b>Number (N=400)</b>	<b>Percentage (100.00)</b>
1. Causes of dengue infection	378	94.5
2. Time when the mosquitoes that caused dengue seek food	331	87.8
3. Places where mosquitoes lay eggs	258	64.5
4. 4. Symptoms of people infected with dengue	136	34.0
5. High-risk persons for dengue infection	271	67.8
6. Prevention of mosquito bite	300	75.0
7. Eliminating mosquito-breeding areas, especially in drinking-water containers	346	86.5
8. Prevention and elimination of mosquito-breeding areas in water containers for general use	353	88.3
9. Prevention/elimination of mosquito-breeding areas in water storage in bathrooms/toilets	355	88.8
10. Prevention/elimination of mosquito-breeding areas in saucers of food containers	367	91.8
11. Prevention/elimination of mosquito-breeding areas in plant bowls	375	93.8

#### **Attitudes towards dengue hemorrhagic fever**

Considered by item, most attitudes were good (i.e. answered “agree” with the positive questions and “disagree” with the negative questions); 92.5% agreed that DHF can be prevented (No. 5); 91.3% agreed that everyone had the same risk of dengue infection (No. 1), and 90.3% agreed that dengue can cause death (No. 4). Incorrect attitudes among the sample group were as follows: 15.5% agreed that people infected with dengue might normally get a red rash on their skin and it was not taken seriously

(No. 7), and healthy people did not seem to be affected by dengue, although mosquitoes that carried the disease had bitten them (14.3%) (No. 6) (Table 4).

**Table 4: Percentage of family health leaders by attitude to DHF**

Attitude to DHF	Highly Agree	Agree	Uncertain	Disagree	Highly Disagree	$\bar{X}$
	%	%	%	%	%	
<b>Positive statements</b>						
1. Everyone has the same risk of dengue infection	41.5	49.8	4.8	3.3	0.8	4.28
2. Dengue can infect more than once	29.0	50.8	17.7	2.0	0.5	4.06
3. Dengue can cause death	51.0	39.3	4.7	4.0	1.0	4.35
4. Dengue can be prevented	49.8	42.7	3.0	2.7	1.8	4.36
5. Illness caused by dengue might waste resources for its care and treatment	25.8	45.0	18.0	8.7	2.5	3.47
<b>Negative statement</b>						
6. Dengue only appears in children; it does not affect adults	3.5	8.3	23.2	48.7	16.3	3.66
7. Healthy people do not seem to be affected by dengue, even though mosquitoes that carry the disease bite them	2.5	11.8	23.2	48.7	16.3	4.01
8. People infected with dengue normally might get a red rash on their skin and it is not taken seriously	4.5	11.0	12.3	46.7	25.5	3.78

### Attitude to DHF prevention/control behavior

The prevention/control of DHF attitudes ranged from a high level (84.3%) to a moderate level (15.8%). The average score was 57.17 (from a possible total score of 70), SD = 6.60; the lowest score was 36 and the highest 70, as shown in Table 5.

**Table 5: Number and percentage of family health leaders by level of attitude to DHF prevention/control behavior**

Level of attitude to DHF prevention/control behavior	Number (N=400)	Percentage (100.0)
Positive (52-70 points)	337	84.3
Moderate (33-51 points)	63	15.8
Negative (14-32 points)	0	0
$\bar{X} = 57.17$	S.D. = 6.60	Min = 36    Max = 70

When considering each item, most attitudes were good (i.e., answered “agree” with the positive questions and “disagree” with the negative questions); 91.3% agreed the community needed to get involved to solve DHF problems effectively and continuously (No. 14). 90.2% felt that getting children to use mosquito nets during the daytime might reduce the risk of DHF infection (No. 4). And 89.4% felt that every family member needed to search for and eliminate mosquito-breeding areas inside and outside the house (No. 11). The incorrect attitudes were as follows: 15.3% felt it might take a lot of time and be difficult to eliminate mosquito-breeding areas (No. 6), and 10.5% agreed that putting Abate sand into the water might make it smelly and degrade water quality (No. 9).



**Table 6: Percentage of family health leaders, by attitude to DHF prevention/control behavior.**

Attitude to DHF prevention/control behavior	Highly Agree %	Agree %	Uncertain %	Disagree %	Highly Disagree %	$\bar{X}$
<b>Positive statement</b>						
1. People bitten during the daytime are at risk of DHF infection	28.5	50.5	15.3	4.7	1.0	4.01
2. Children who stay at home have a greater risk of DHF infection than children who play outdoors	18.7	51.3	21.3	6.7	2.0	3.78
3. Mosquito larvae cause dengue	43.0	46.0	7.2	2.8	1.0	4.27
4. Having children use mosquito nets during the daytime might reduce the risk of DHF infection	48.7	41.5	7.5	1.5	7.5	4.36
5. Having covers on the tops of water containers might reduce the risk of mosquitoes' breeding	41.0	44.3	8.8	4.8	1.3	4.19
6. Disposal of unwanted matter, such as broken dishes or automobile tires can reduce the spread of DHF	44.3	42.5	6.8	5.0	1.5	4.23
7. Having fish in water containers can kill mosquito larvae and prevent dengue	30.5	53.0	11.0	5.5	0	4.08

**Table 6: (Cont.) Percentage of family health leaders, by attitude to DHF prevention/ control behavior.**

Attitude to DHF prevention/control behavior	Highly Agree		Uncertain	Disagree		Highly Disagree	$\bar{X}$
	%	%	%	%	%		
8. Every family member needs to search for and eliminate mosquito-breeding areas inside and outside the house	55.7	33.7	5.8	4.4	0.8	4.40	
9. Eliminating mosquito-breeding areas is very easy and convenient for everyone	35.3	53.7	5.8	4.4	0.8	4.18	
10. The community needs to get involved to solve DHF problems effectively and continuously	49.0	42.3	4.7	3.7	0.3	4.36	
<b>Negative statements</b>							
11. It might take a lot of time and be difficult to eliminate mosquito-breeding areas	4.0	11.3	10.3	56.4	18.0	3.73	
12. Putting Abate sand into the water may make it smelly and degrade water quality	2.0	8.5	25.8	51.7	12.0	3.63	
13. The elimination of mosquito-breeding areas has been done by public health staff	2.3	6.0	8.0	49.4	34.3	4.08	
14. Only the smoky spray technique would be used to eliminate <i>Aedes</i> mosquitoes	1.8	6.5	11.7	63.5	16.5	3.87	

The reinforcing factors comprised information perception about DHF and DHF prevention/control, and information sources and resource efficiency for DHF prevention/control. The study showed that:

#### **Information perceptions about DHF and DHF prevention/control**

Most of the family health leaders in the sample group (87.0%) had high-level information perceptions, followed by 12.5% at the moderate level, and 0.5% for low level (Table 7).

**Table 7: Family health leaders, by score levels for information perceptions about DHF and DHF prevention/control.**

<b>Score levels for information perceptions about DHF and DHF prevention/control</b>	<b>Number (N=400)</b>	<b>Percentage (100.0)</b>
High level (8-9 points)	348	87.0
Moderate level (4-7 points)	50	12.5
Low level (0-3 points)	2	0.5
$\bar{X} = 8.46$	S.D = .96	Min = 3
		Max = 9

The information perceptions of the sample group about prevention and elimination of mosquito-breeding areas, by turning upside down, burning and burying unwanted matter, such as coconut shells, automobile tires, and tins (No. 7) rated at 98.8%, followed by the causes of infection with dengue (No. 2) (98.5%), information on dengue (No. 1) (98.3%), while information on prevention of mosquito bite (No. 9), personal prevention using mosquito nets (No. 7), and the dengue situation (No. 9) all rated 96.5%. Information about the prevention and elimination of mosquito-breeding areas in open containers using Abate sand to kill mosquito larvae every 1-3 months

(No. 8) rated 95.3%. Whereas, the same levels of information perception of the sample group (94.8%) were recorded for dengue needed to be treated immediately (No. 4), and children from newborn-15 years of age are at higher risk of DHF infection than others (No. 5). In contrast, the lowest level of information perception was on the reverse of dengue (No. 4) (Table 8).

**Table 8: Number and percentage of family health leaders, by information perceptions of DHF and DHF prevention/control.**

<b>Information perceptions of DHF and DHF prevention/control</b>	<b>Number (N=400)</b>	<b>Percentage (100.0)</b>
1. Ever received information about dengue	393	98.3
2. Know about the causes of DHF infection	394	98.5
3. Know about the reverse of dengue	329	82.3
4. Know that treatment for dengue needs to be accurate and immediate	379	94.8
5. Know that children from newborn-15 years of age have higher risk of DHF infection than others	379	94.8
6. Know that mosquito larvae can be prevented and eliminated by placing salt, detergent, or vinegar in saucers of food containers in mosquito-breeding areas in the house	346	86.5
7. Know that the prevention and elimination of mosquito-breeding areas by turning upside down, burning and burying unwanted matter, such as coconut shells, automobile tires and tins, can prevent dengue	395	98.8
8. Know about the prevention and elimination of mosquito-breeding areas in open containers using Abate sand to kill mosquito larvae every 1-3 months	381	95.3
9. Know that personal prevention from mosquito bite can prevent dengue	386	96.5

**Types of information source from which the sample group had received information about DHF and DHF prevention/control**

The most popular DHF information source was radio/television (68.5%), whereas the least popular was broadcast tower and voice online (38.5%). The most popular information source about DHF causes of infection was public health staff/health volunteers (88.4%), while the least popular was broadcast tower and voice online (33.8%). In addition, the most popular information source about treatment was public health staff/health volunteers (85.5%), whereas the least popular was broadcast tower and voice online. The most popular information source about prevention and elimination of mosquito-breeding areas in the house by putting salt, detergent or vinegar on the food container saucer was public health staff/health volunteers (75.0%), whereas the least popular was broadcast tower and voice online (17.8%) (Table 9).

**Table 9: Number and percentage of family health leaders, by information sources about DHF and DHF prevention/control (more than 1 answer)**

Question item	Information sources									
	Public health staff/Health volunteers		Radio/Television		Handbill/Poster/ Newspaper		Neighbor/communit y leaders/monks/ teachers/ imam		Broadcast tower and voice online	
	Number (N=400)	percentage (100.0)	Number (N=400)	percentage (100.0)	Number (N=400)	percentage (100.0)	Number (N=400)	percentage (100.0)	Number (N=400)	percentage (100.0)
1. Get information about dengue	333	83.3	275	68.5	234	58.5	170	42.5	154	38.5
2. Get information about causes of dengue infection	355	88.8	276	69.0	227	56.8	176	44.0	135	33.8
3. Get information about the reverse of dengue	287	71.8	203	50.8	174	43.5	127	31.8	98	24.5
4. Get necessary information about treatment for dengue to take action accurately and immediately	342	85.5	241	60.3	198	49.5	133	33.3	99	24.8
5. Know about children from newborn to 15 years having a higher risk of dengue infection than others	316	79.0	234	58.5	208	52.0	133	33.3	102	25.5
6. Know about prevention and elimination of mosquito-breeding areas in the house by putting salt, detergent, or vinegar on a food container saucer to eliminate mosquito larvae	300	75.0	184	46.0	186	46.5	143	35.8	71	17.8
7. Know about the prevention and elimination of mosquito-breeding areas by turning upside down, burning and burying unwanted matter, such as coconut shells, automobile tires and tins	361	90.3	236	59.0	218	54.5	167	41.8	113	28.3
8. Know about the prevention and elimination of mosquito-breeding areas in open containers by using Abate sand to kill mosquito larvae every 1-3 months	358	89.5	199	49.8	187	46.8	132	33.0	82	20.5
9. Know about personal protection from mosquito bite to prevent dengue	343	85.8	230	57.5	213	53.3	154	38.5	110	27.5

### **Adequacy of resources for DHF prevention/control**

It was found that most of the sample group had inadequate resources for DHF prevention/control (54.5%), whereas only 45.5% of the sample group had adequate resources (Table 10).

**Table 10: Number and percentage of family health leaders, by adequacy of resources for DHF prevention/control.**

<b>Adequacy of resources for DHF prevention/control</b>	<b>Number (N=400)</b>	<b>Percentage (100.0)</b>
Adequate	182	45.5
Inadequate	218	54.5

12.2% of the sample group had never had a mosquito net or it had been unavailable for everyone in the family, or it had been very old and unrepaired. 27.2% had not covered every water container and had not taken any measures to prevent and eliminate mosquito larvae and their breeding areas properly.

36.8% of the sample group had inadequate Abate sand and had taken no appropriate preventive measures against mosquito larvae or elimination of their breeding areas (Table 11).

**Table 11: Number and percentage of family health leaders, by resources for DHF prevention/control.**

Types of resources		Number (N=400)	Percentage (100.0)
Mosquito nets	Adequate	351	87.8
	Inadequate	49	12.2
Covers	Adequate	291	72.8
	Inadequate	109	27.2
Abate sand	Adequate	253	63.2
	Inadequate	147	36.8

**The enabling factors** comprised advice and follow-up by the public health staff about DHF and DHF prevention/control, and also attendance at a seminar about DHF prevention/control promotion activities.

Most of the sample group had received advice and follow-up by public health staff at a high level (88.0%), followed by advice and follow-up at medium and low levels (10.5 and 1.5%, respectively) (Table 12).

**Table 12: Number and percentage of family health leaders, by level of advice and follow-up by public health staff when dengue had spread.**

Score levels for advice and follow-up by public health staff when dengue had spread	Number (N=400)	Percentage (100.0)
High level (14-20 points)	352	88.0
Moderate level (7-13 points)	42	10.5
Low level (0-6 points)	6	1.5
$\bar{X} = 17.9$ S.D = 3.5      Min = 2      Max = 20		



Most of the sample group reported the main information was advice and follow-up by the public health staff about the causes of dengue infection (No. 1) (97.2%), followed by advice about a healthy environment around the house, without mosquito-breeding areas (No. 5) (97.0%), and advice about dengue prevention (No. 3) (96.5%). The lowest scores were for advice about eliminating mosquito-breeding areas every week (No. 8) (91.5%), public health staff had told the sample group about observing the symptoms of people infected with dengue (No. 2), followed by 92.2% of the sample group who had been followed-up and made vigilant. Moreover, advice had been provided to most of the sample group more than once (Table 13).

**Table 13: Number, percentage, and mean values of family health leaders, by advice and follow-up by public health staff when dengue had spread.**

Advice and follow-up by public health staff when dengue had spread	Never		Received advice and follow-up by health team	
	N	%	N	%
1. Advice about the causes of dengue infection	11	2.8	389	97.2
2. Advice about observing symptoms of people infected with dengue	31	7.8	369	92.2
3. Advice about preventing dengue	14	3.5	386	96.5
4. Advice about the harm of dengue	15	3.8	385	96.2
5. Advice about a healthy environment around the house, free of mosquito-breeding areas	12	3.0	388	97.0
6. Advice about cleaning water containers every week	28	7.0	372	93.0
7. Advice about using mosquito nets to prevent mosquito bite during day and night	27	6.8	373	93.2
8. Advice about eliminating mosquito-breeding areas every week	34	8.5	365	91.5
9. Offer of Abate sand by public health staff or health volunteers	23	5.8	377	94.2
10. Advice on using Abate sand	20	5.0	380	95.0

### **Attendance at seminar and joined promotional activities for DHF prevention/control**

Most of the sample group had attended a seminar or joined promotional activities for DHF prevention/control at a low level (35.4%), followed by high and low levels (33.8 and 30.8%, respectively). The average was 5.2 points, S.D. = 3.4, minimum value = 1 point, maximum value = 10 points (Table 14)

**Table 14: Number and percentage of family health leaders, by attending seminar or joining promotional activities for DHF prevention/control.**

<b>Score levels for attending seminar or joining promotional activities for DHF prevention/control</b>	<b>Number (N=400)</b>	<b>Percentage (100.0)</b>
High level (8-10 points)	135	33.8
Medium level (4-7 points)	123	30.8
Low level (0-6 points)	142	35.4
$\bar{X} = 5.2$	S.D = 3.4	Min = 1      Max = 10

Most of the sample group had joined DHF prevention/control promotional activities (No. 2) (75.5%), followed by activities for searching for and eliminating mosquito-breeding areas every week (No. 4), and attending a seminar about dengue and DHF prevention/control (No. 1) (70.0 and 62.5%, respectively). 47.5% of the sample group participated in establishing a group for DHF prevention/control (No. 5), while 53.3% used to attend a local debate (No. 3). For frequency of joining promotional activities for DHF prevention/control, it was found that most of the sample group used participated more than once (Table 15).

**Table 15: Percentage of family health leaders, by attending seminar or joining promotional activities for DHF prevention/control.**

Attending seminar or joining promotional activities for dengue prevention/control	Never		Ever	
	N	%	N	%
1. Attended seminar about DHF and DHF prevention/control	110	27.5	290	62.5
2. Joined promotional activities for DHF prevention/control	98	24.5	302	75.5
3. Joined local debate on DHF prevention/control	187	46.8	213	53.3
4. Joined searching and eliminating mosquito-breeding areas every week	120	30.0	280	70.0
5. Participated in establishing group or club for DHF prevention/control	210	52.5	190	47.5

Analysis of the dengue prevention/control behaviors among the family health leaders in the study showed that most (51.3%) had good score levels for dengue prevention/control behaviors, followed by satisfactory and poor levels (47.5 and 1.2%, respectively), while the average was 7.6 points, S.D. = 1.8, minimum value = 1 point, maximum value = 10 points (Table 16).

**Table 16: Number and percentage of family health leaders, by score levels for DHF prevention/control behaviors.**

Score levels for dengue prevention/control behaviors	Number (N=400)	Percentage (100.0)
Good (8-10 points)	205	51.3
Fair (4-7 points)	190	47.5
Poor (0-3 points)	5	1.2
$\bar{X} = 7.6$	S.D = 1.8	Min = 1
		Max = 10

The most-practiced dengue prevention/control behavior of the sample group related to a healthy environment and living space, in which it was very important every week to maintain areas without water or overgrown areas, which could serve as mosquito habitats (No. 9) (97.3%), followed by 96.3% for placing covers on the tops of drinking-water containers or containers of water for other uses every time after opening them (No. 1). On the other hand, the least practiced activity was cleaning up or draining water from saucers every week (No. 6) (39.8%), followed by the prevention and elimination of mosquito larvae in vases used in the house, such as on the table, on the shelf, in the spirit house, which needed to be cleared up every week (No. 5) (46.5%).

This study found that the sample group had better practices for dengue prevention/control behaviors, with regular practice of each activity rather than ignorance of practices, except for the practice of cleaning and draining water from saucers every week (No. 6), for which the sample group had answered lack of equipment rather than regular practice, which was the same as the practice for the prevention and elimination of mosquito larvae in vases used in the house that needed to be cleared up every week (No. 5) (Table 17)

**Table 17: Number and percentage of family health leaders, by dengue prevention/control behaviors.**

DHF prevention/control behavior	Regularly practice		Never practice	
	N	%	N	%
1. Having covers on the top of any water containers for drinking water or water for other uses every time after opening them (N=391)	385	96.3	6	1.5
2. Use of chemicals saucers of food containers to prevent laying of mosquito eggs or draining the water every 7 days (N=251)	249	62.3	5	1.3
3. Use of Abate sand in toilet/bathroom every 1-3 months (N=372)	303	75.7	69	17.3
4. Prevention and elimination of mosquito larvae in any container by cleaning every week (N=273)	264	66.0	9	2.3
5. Prevention and elimination of mosquito larvae in vases in the house by cleaning up every week (N=189)	186	46.5	3	0.8
6. Cleaning and draining water from saucers every week, to prevent laying of mosquito eggs (N=161)	159	39.8	2	0.5
7. Going to bed with a mosquito net during the day or night (N=369)	368	92.0	1	2.5
8. Disposal of unwanted matter around the house, such as tins, coconut shells, and automobile tires by putting upside down, burning or burying every week (N= 378)	368	92.0	10	2.5
9. Taking care every week of a healthy environment in living spaces, without water-filled or overgrown areas, which could be mosquito habitats (N = 400)	389	97.3	11	2.8
10. Searching for and eliminating mosquito breeding areas every Friday of the week (N= 400)	30	92.5	370	7.5

### **Part 3. Relationship between socio-demographic, predisposing, enabling, and reinforcing factors in DHF prevention/control**

#### **3.1 Relationship between socio-demographic factors and DHF prevention/control.**

The results showed that the relationship between socio-demographics--gender, marital status, religion, occupation--and DHF prevention/control behaviors, were as follows.

Gender: gender was not related to DHF prevention/control behavior without significance at .05 ( $p = .837$ ); females demonstrated better DHF prevention/control behaviors than males, because more of the sample group of females had attended a seminar on DHF knowledge than males (Table 18).

**Table 18: Relationship between gender and DHF prevention/control behaviors.**

<b>Gender</b>	<b>DHF prevention/control behavior</b>		<b>Total (%)</b>	<b>Chi-Square</b>	<b>P-Value</b>
	<b>Never practice</b>	<b>Regularly practice</b>			
Male	71 (47.0)	80 (53.0)	151 (100)	0.052	0.837
Female	120 (48.2)	129 (51.8)	249 (100)		
Total	191 (47.8)	209 (52.2)	400 (100)		

Marital status: marital status was significantly related to DHF prevention/control behavior, at .05 ( $p = .011$ ); the couples group had family members in their childhood they had to take for behavior and they had better DHF prevention/control behaviors than the single or widowed groups (Table 19).

**Table 19: Relationship between marital status and DHF prevention/control behavior.**

Marital status	DHF prevention/control behavior		Total (%)	Chi-Square	P-Value
	Never practice	Regularly practice			
Single	35 (35.0)	65 (65.0)	100 (100)	8.970	0.011
Couple	145 (51.6)	136 (48.4)	281 (100)		
Widowed	11 (57.9)	8 (42.1)	19 (100)		
Total	191 (47.8)	209 (52.2)	400 (100)		

Religion: religion was significantly related to DHF prevention/control behavior, at .05 ( $p = .017$ ); which can be explained by the Ministry of Public Health's supporting people's knowledge, and the principal method used was by giving information to people who passed it on, such as monks and imams. In the Islam/Muslim religion, people believe the imam when he suggests they conduct DHF prevention/control behaviors. The Muslim people had better DHF prevention/control behaviors than the Buddhists (Table 20).



**Table 20: Relationship between religion and DHF prevention/control behaviors.**

Religion	DHF prevention/control behaviors		Total (%)	Chi-Square	P-Value
	Never practice	Regularly practice			
Buddhist	117 (52.7)	105 (47.3)	222 (100)	4.905	0.034
Islam/Muslim	74 (41.6)	104 (58.4)	178 (100)		
Total	191 (47.8)	209 (52.2)	400 (100)		

Occupation: occupation was significantly related to DHF prevention/control behavior, at .01 ( $p = .008$ ). Tamode District, Phatthalung Province, is a good area for agriculture, and the sample group worked in agriculture when the public health staff selected the family health leaders. They selected the agricultural group because they had more time to attend seminars than other occupations (Table 21).

**Table 21: Relationship between occupation and DHF prevention/control behaviors.**

Occupation	DHF prevention/control behaviors		Total (%)	Chi-Square	P-Value
	Never practice	Regularly practice			
	Agriculture	128 (53.6)			
Employed	29 (50.9)	28 (49.1)	57 (100)		
Commerce	8 (42.1)	11 (57.9)	19 (100)		
Housewife	7 (46.7)	8 (53.3)	15 (100)		
Official	6 (28.6)	15 (71.4)	21 (100)		
Unemployed	7 (38.9)	11 (61.1)	18 (100)		
Other	6 (19.4)	25 (80.6)	31 (100)		
Total	191 (47.8)	209 (52.2)	400 (100)		

Age: age was significantly positively related to DHF prevention/control among the family health leaders, at .01 ( $r_s = 0.172, p = .001$ ). This means that if family health leaders were in the higher age range, they would have good DHF prevention/control behaviors (Table 22).

Income: income was significantly positively related to DHF prevention/control behaviors among the family health leaders, at .01 ( $r_s = 0.139$ ,  $p = .005$ ), which means that the family health leaders with high incomes would have good DHF prevention/control behaviors (Table 22).

Education level: educational level was not significantly positively related to DHF prevention/control among the family health leaders, at .01 ( $r_s = .025$ ,  $p = .612$ ) (Table 22).

**Table 22: Correlation between age, income, and education level with DHF prevention/control.**

Variables	DHF prevention/control	
	( $r_s$ )	P-value
Age	0.172	P = .001**
Income	0.139	P = .005**
Education level	0.025	P = .612

\* P < .05

\*\* P < .01

### **3.2 Relationship between predisposing factors (attitudes to DHF, attitudes to DHF prevention/control) and DHF prevention/control behaviors**

Statistical analysis of the relationship between attitude to disease and DHF prevention/control behavior, using Pearson's product moment correlation coefficient, found that:

Attitude to disease among the family health leaders was significantly positively related to DHF prevention/control behavior, at .01 ( $r_s = 0.241, p = .000$ ). The family health leaders who had good attitudes to disease seemed to have good DHF prevention/control behaviors (Table 23).

The DHF prevention/control attitudes of the family health leaders were significantly positively related to their DHF prevention/control behaviors, at .01 ( $r_s = 0.328, p = .000$ ). The family health leaders with good DHF prevention/control attitudes seemed to have good DHF prevention/control behaviors (Table 23).

**3.3 The relation between the reinforcing factors--information perception about disease and DHF prevention/control--and information sources and the adequacy of resources for DHF prevention/control, it was found that:**

The information perception about disease and DHF prevention/control among the family health leaders had been positively related to the prevention/control behavior of dengue of the family health leaders with significance at .05 ( $r_s = 0.165, p = .001$ ) in which the family health leaders who had received information about disease and DHF prevention/control seemed to have the good behavior on the DHF prevention/control (Table 23).

The adequacy of DHF prevention/control resources was significantly positively related to the prevention/control behaviors of the family health leaders, at .01 ( $r_s =$

0.982,  $p = .000$ ). The sample group with a good adequacy of resources seemed to have good DHF prevention/control behaviors (Table 23).

**3.4 Regarding the relationships between the enabling factors, the advice and follow-up by the public health staff about disease, DHF prevention/control, attending a DHF prevention/control seminar and joining promotional activities, it was found that:**

The advice and the follow-up by the public health staff about disease and DHF prevention/control was significantly positively related to the DHF prevention/control behaviors of the family health leaders, at .05 ( $r_s = 0.126$ ,  $p = .012$ ). The family health leaders who had been advised and follow-up by the public health staff about disease and DHF prevention/control were the same ones who had good DHF prevention/control behaviors (Table 23).

Attending a DHF prevention/control seminar and joining promotional activities was significantly positively related to DHF prevention/control behavior among the family health leaders, at .01 ( $r_s = 0.211$ ,  $p = .000$ ). The family health leaders who had attended a seminar or joined DHF prevention/control promotional activities regularly seemed to have good DHF prevention/control behaviors (Table 23).

**Table 23: Correlation between predisposing, reinforcing and enabling factors, and DHF prevention/control behavior.**

Variables	DHF prevention/control behavior	
	(r <sub>s</sub> )	P- value
1. Attitude to DHF disease	0.241	P= 0.000**
2. Attitude to DHF prevention/control	0.328	P = 0.000**
3. Information perception about disease and DHF prevention/control	0.165	P = 0.001*
4. Adequacy of resources for DHF prevention/control	0.982	P = 0.000**
5. Advice by public health staff about DHF and DHF prevention/control	0.126	P = 0.012*
6. Attendance at seminar and joining DHF prevention/control promotional activities	0.211	P = 0.000**

\* P< .05

\*\* P< .01

Analysis of the relationships between the following factors are summarized below: (1) population factors (gender, age, marital status, religion, educational level, occupation and income); (2) predisposing factors (knowledge of dengue and the prevention/control of disease, attitude to dengue and the prevention/control of disease); (3) reinforcing factors (information perceptions about disease and DHF prevention/control, information sources, the adequacy of resources for DHF prevention/control; (4) enabling factors (advice and follow-up by the public health staff about disease and DHF prevention/control, attendance at a seminar and joining DHF

prevention/control promotional activities; and the DHF prevention/control behavior of family health leaders (Table 24).

**Table 24: Testing the results of the relations between factors related to DHF prevention/control behaviors of family health leaders.**

Studied factors	Statistical test	P-value	Relation
Population factors			
– Gender	Chi-square	0.837	Not relevant
– Age	Correlation	0.001	Relevant
– Marital status	Chi-square	0.011	Relevant
– Religion	Chi-square	0.017	Relevant
– Educational level	Correlation	0.612	Not relevant
– Occupation	Chi-square	0.008	Relevant
– Income	Correlation	0.000	Relevant
Predisposing factors			
– Attitude to DHF	Correlation	0.000	Relevant
– Attitude to DHF prevention/control behaviors	Correlation	0.000	Relevant
Reinforcing factors			
– Information perception of disease and DHF prevention/control	Correlation	0.001	Relevant
– Adequacy of resources	Correlation	0.001	Relevant
Enabling factors			
– Advice and follow-up by public health staff	Correlation	0.102	Relevant
– Attendance at seminar and joining activities	Correlation	0.001	Relevant

#### **Part 4. Behaviors for the elimination of mosquito-breeding areas among family health leaders**

The survey of interviewees from 400 families found those who had jars/drinking water containers at 72.8%, and no jars/drinking water containers at 27.2%, while jars/water containers for water for use was 92.5%, and no jars/water containers for use was 7.5%. Water storage in bathroom/toilet was 100%, water in vase/planting bowl/basin was 43.8%, whereas those without were 56.2%. Saucers of flowerpots were 68.0%, while those without were 32.0%. Saucers for food containers were 62.5%, and 85.2% of the families had no used automobile tires, families that disposed of unwanted matter, such as tins/coconut shells was 70.8%, and those not disposing of unwanted matter was 29.2% (Table 25).

**Table 25: Percentage of families among the family-health-leader sample group with water containers that could serve as mosquito-breeding areas.**

<b>Families with water containers</b>	<b>Number</b>	<b>Percentage</b>
1. Jars/drinking water containers	291	72.8
2. Jars/any water containers for use	370	92.5
3. Water storage in bathroom/toilet	400	100.0
4. Vase/plant bowl/basin	175	43.8
5. Saucer of flowerpot	128	32.0
6. Saucer of food container	150	37.5
7. Unused automobile tires	329	82.2
8. Disposal of unused matter, e.g., tins/coconut shells	283	70.8