CHAPTER FOUR
RESULTS

This chapter presents the results which are derived from the data analyzed by SPSS program, version 14.0. Based on the data obtained from the questionnaires, the study results will be presented in 4 parts as follows:

      4.1   General Information of Respondents

      4.2   Respondents' Knowledge of Solid-Waste Separation

      4.3   Respondents' Solid-Waste Separation Behaviors

      4.4   Hypothesis Testing

4.1 GENERAL INFORMATION OF RESPONDENTS

There were five questions included in this part. The first questions asked for the respondents' gender. The second question reported the respondents' age while the third question showed the respondents' occupation. The fourth and fifth questions asked for the respondents' education and their income per month, respectively.

As shown in Table 1, the respondents of the study were 127 people in Anusaowaree Sub-district, Bangkhen District, Bangkok. The number of male respondents (42.5%) was less than female respondents (57.5%). The majority of people were aged 40 years or higher, which accounted for 41.7%, followed by the age range of between 30-39 years, accounting for 31.5%. Most of respondents (49.6%) were company employees, while the other respondents were in the minority at 3.9% – 8.7%. About 51.2% of respondents graduated with a bachelor degree or higher, close to the rest of respondents (48.8%) whose education were lower than a bachelor degree. The majority of the respondents (29.9%) earned their income per month between 7,000 - 14,000 baht, followed by the respondents (24.4%) who got their monthly income more than 28,000 baht. The remaining respondents who got their monthly income of less than 7,000 baht and between 14,001 - 28,000 baht were reported as 22.8% equally.

Table 1. Demographic Data of Respondents

Total	Frequency 127	Percentage (%)
1. Gender		
Male	54	42.5
Female	73	57.5
2. Age		
29 years or below	34	26.8
30 - 39 years	40	31.5
40 years or higher	53	41.7
3. Occupation		
Student	9	7.1
Merchant	8	6.3
Small trader	8	6.3
Company employee	63	49.6
Government worker / State enterprise worker	9	7.1
General employment	11	8.7
Unemployed	14	11.0
Others	5	3.9
4. Education		
Lower than Bachelor's degree	62	48.8
Bachelor's degree or higher	65	51.2
5. Income Per Month		
Less than 7,000 Baht	29	22.8
7,000 - 14,000 Baht	38	29.9
14,001 - 28,000 Baht	29	22.8
More than 28,000 Baht	31	24.4

4.2   RESPONDENTS' KNOWLEDGE OF SOLID-WASTE SEPARATION

In the second part of the questionnaire the level of solid-waste separation knowledge of the respondents was investigated. It was found that the mean score was 8.46, which was at a good level.

Table 2 revealed the level of knowledge of solid-waste separation. When considering the dried waste questions (statement 1-8), it was found that most of the subjects had knowledge about cardboard box separation (96.9%), followed by the knowledge of newspaper separation (94.5%) and the knowledge about glass bottle separation (90.6%). However, the subjects had the knowledge about used paper separation at least (27.6%); on the contrary, most of them (46.5%) misunderstood that tearing used paper was a correct practice for recycling.

To consider the questions about biowaste (statement 9-13), it could be seen that most of subjects had a moderate knowledge about this waste. Especially, majority of subjects could define the meaning of biowaste (89.8%) and also knew how to manage used cooking oil (85.8%). Nevertheless, they were unfamiliar with biowaste bin and didn't know how to close and where to keep it in a kitchen (44.1% and 35.4%).

Table 2. Percentage of Respondents Who Had and Did Not Have Solid-Waste Separation Knowledge (n = 127)

Questions	True	False	Uncertain
1. Newspapers should be stacked and bundle with rope	120 (94.5%)	2 (1.6%)	5 (3.9%)
2. A big cardboard box should be deflated or cut to small pieces before throwing away or selling to merchant.	123 (96.9%)	3 (2.4%)	1 (0.8%)
3. Tearing used paper into small pieces will make it easy to bring in the recycle process.	35 (27.6%)	59 (46.5%)	33 (26.0%)
4. Before compiling paper, paper clips, adhesive tapes, plastic covered pages should be removed from them	102 (80.3%)	10 (7.9%)	15 (11.8%)
5. Before compiling and throwing away glass bottles together, all beer caps, crown corks, screw tops, corks, metal seals should be removed from them.	97 (76.4%)	12 (9.4%)	18 (14.2%)

Table 2. Percentage of Respondents Who Had and Did Not Have Solid-Waste Separation Knowledge (n = 127) (continued)

6. Clear glass and colored glass should be set apart from each other before throwing away	64 (50.4%)	15 (11.8%)	48 (37.8%)
7. Glass bottles should not be broken but put them whole separately in the same bin	115 (90.6%)	7 (5.5%)	5 (3.9%)
8. Earthenware or ceramic bottles the same as the other cosmetic bottles should be put together with waste glass.	47 (37.0%)	43 (33.9%)	37 (29.1%)
9. Biowaste refers to all sorts of garden garbage such as cut grass, cuttings and pruning from trees, hedges and shrubs, dead plants as well as kitchen scraps which are suitable to become fertilizer.	114 (89.8%)	5 (3.9%)	8 (6.3%)
10. Biowaste bin should not be closed tightly in order to have ventilation.	28 (22.0%)	56 (44.1%)	43 (33.9%)
11. Biowaste should be placed in a cool area of a kitchen	37 (29.1%)	45 (35.4%)	45 (35.4%)
12. Pouring used cooking oil into the sink or toilet bowl will cause problems in the sewerage system leading to high cleaning costs.	109 (85.8%)	9 (7.1%)	9 (7.1%)
13. Disposing a plastic bag in a biowaste bin does not cause any problems.	84 (66.1%)	19 (15.0%)	24 (18.9%)

4.3 RESPONDENTS' SOLID-WASTE SEPARATION BEHAVIORS

The third part of the questionnaire was concerned with the frequency of solid-waste separation behaviors of the respondents in their everyday life. The findings were shown in the form of mean. It was found that the mean score was 18.83, which was at the frequency of sometimes level.

Table 3 showed the test result of solid-waste separation behavior. Looking into details, it could be found that most of the subjects always separated plastic bottles, soft drink cans, glass and newspaper, respectively (X = 1.63, 1.53, 1.48). Converse to a UHT milk box washing, separating corks and plastic labels and wrapping unburnable glass waste which means accounted as 0.45, 0.76, 0.85 respectively, this

means it was hard for subjects to manage and separate solid-wastes in the complicated method.

Table 3. Frequency of Solid-Waste Separation Behaviors (n = 127)

Description	Always	Sometimes	Hardly	X	SD
1. Your household has separated solid-waste into 2 categories – fresh waste and dried waste or recycled waste	38 (29.9%)	70 (55.1%)	19 (15.0%)	1.15	.656
2. Before throwing away or selling to a merchant, you fold and bundle newspapers with rope	70 (55.1%)	48 (37.8%)	9 (7.1%)	1.48	.628
3. Before selling to a merchant, you separate cardboard boxes, beer boxes and other boxes from other wastes to fold and bundle together.	67 (52.8%)	43 (33.9%)	17 (13.4%)	1.39	.714
4. You keep plastic drinking water bottles and soft drink can together, before disposing or selling to a merchant,	92 (72.4%)	23 (18.1%)	12 (9.4%)	1.63	.652
5. Before disposing or selling to a merchant, you unfold a UHT milk box, wash, expose to the sun and bundle with rope	17 (13.4%)	23 (18.1%)	87 (68.5%)	0.45	.721
6. Before throwing away a used diaper, you take out feces in a toilet bowl then roll it up in a small figure.	44 (34.6%)	26 (20.5%)	57 (44.9%)	0.90	.889
7. You separate various kinds of glass from other kinds of wastes in order to sell to merchant	79 (62.2%)	36 (28.3%)	12 (9.4%)	1.53	.665
8. Before collecting as glass waste and disposing or selling to merchant, you pour out remaining water and wash a glass bottle	52 (40.9%)	38 (29.9%)	37 (29.1%)	1.12	.832
9. You keep all unburnable glass waste e.g. neon tube, earthenware, ceramic to be disposed of separately from other kinds of waste	63 (49.6%)	39 (30.7%)	25 (19.7%)	1.30	.780
10. Before throwing away all unburnable glass waste, you wrap it with thick paper, newspapers or put it in its original packaging and label the package as "sharp waste, be careful"	35 (27.6%)	38 (29.9%)	54 (42.5%)	0.85	.827
11. You keep spray bottle waste e.g. hair spray, insect killing spray and put it separately in a bag without drilling and dispose of it far away from flame.	62 (48.8%)	38 (29.9%)	27 (21.3%)	1.28	.794

Table 3. Frequency of Solid-Waste Separation Behaviors *(n = 127) (continued)*

12. Before disposing of all can wastes, you separate corks and plastic labels to throw away with other kinds of plastic waste	29 (22.8%)	39 (30.7%)	59 (46.5%)	0.76	.801
13. You keep an expired batteries to dispose of other hazardous wastes e.g. neon tube, used lubricant, etc.	43 (33.9%)	36 (28.3%)	48 (37.8%)	0.96	.849
14. After disposing of food residues with other fresh wastes, you take out the plastic bag to throw away separately	44 (34.6%)	53 (41.7%)	30 (23.6%)	1.11	.758
15. You separate drained vegetable scrap, fruit scrap and food scrap from other wastes and put them whole in a specific bin	46 (36.2%)	52 (40.9%)	29 (22.8%)	1.13	.760
16. Before disposing of used cooking oil, you soak it with tissue paper, put it in a bag and throw it in a bin	33 (26.0%)	43 (33.9%)	51 (40.2%)	0.86	.804
17. You cut tree branches to be shorter than 50 cm. and bundle them with rope then put in a bag and dispose of them	45 (35.4%)	29 (22.8%)	53 (41.7%)	0.94	.880

4.4   HYPOTHESIS TESTING

Hypothesis 1: Women and men are not different in their solid-waste separation behavior.

To test hypothesis 1, the independent samples T-test was employed in order to find out if there was a significant difference between women and men in the solid-waste behavior.

As shown in Table 4, it was found that males and females were not significantly different in solid-waste separation behavior.

Table 4. *Difference in Solid-Waste Separation Behavior by Sex*

Sex	n	X	SD	t	df	Sig
Male	54	1.08	.42	-.537	125	.592
Female	73	1.12	.45			

*The mean difference is significant at the .05 level.

Hypothesis 2: Old people and young people are not different in waste separation behavior.

To test hypothesis 2, the One-way ANOVA test (F-test) was employed in order to find out if there was a significant difference among people of different ages in solid-waste behavior.

The test result as shown in Table 5 revealed that subjects of various ages were significantly different in solid-waste separation behavior at the 0.01 level.

Moreover, the Mean(X) indicated that subjects had a better solid-waste separation behavior as they became older.

Table 5. Difference in Solid-Waste Separation Behavior by Age

Age	n	X	SD	df	F	Sig
29 years or below	34	.95	.40	2	6.26	**.003**
30 – 39 years	40	1.04	.46			
40 years or higher	53	1.25	.39			

*The mean difference is significant at the .01 level.

In order to find out the difference between each pair of age ranges in the solid-waste separation behavior, the Scheffé test was employed to test the hypothesis.

The result of the test in Table 6 revealed that the group of subjects aged 29 years old or below and the group of subjects aged 40 years old or higher were significantly different in solid-waste separation behavior at the 0.05 level.

Table 6. Multiple Comparisons in Solid-Waste Separation Behavior by Age

(I) Age	(J) Age	Mean Difference (I-J)
29 years or below	30 - 39 years	-.08962
	40 years or higher	**-.30704(*)**
30 - 39 years	29 years or below	.08962
	40 years or higher	-.21743
40 years or higher	29 years or below	**.30704(*)**
	30 - 39 years	.21743

*The mean difference is significant at the .05 level.

Hypothesis 3: People who have an education of lower than Bachelor's degree and those who have a Bachelor's degree or higher degree are not different in waste separation behavior.

To test hypothesis 3, the independent sample t-test was employed in order to find out if there was significant difference between subjects with a lower education than a Bachelor's degree and those who graduated with a Bachelor's degree or higher degree in a solid-waste separation behavior.

As shown in Table 7, it was found that there was significant difference in the solid-waste separation behavior at the 0.00 level.

Table 7. Difference in Solid-Waste Separation Behavior by Education

Variable	n	X	SD	t	df	Sig
Below bachelor degree	62	1.25	.41	3.798	125	.00
Bachelor degree or higher	65	.97	.41			

*The mean difference is significant at the .05 level.

Hypothesis 4: People who have high income and people who have low income are not different in waste separation behavior.

To test hypothesis 4, the One-way ANOVA test (F-test) was employed in order to find out if there was a significant difference among people who earn monthly income less than 7,000 Baht up to more than 28,000 Baht in a solid-waste behavior.

The test result as shown in Table 8 can be seen that there was no significant difference in the solid-waste separation behavior among subjects who had different levels of income.

Table 8. Difference in Solid-Waste Separation Behavior by Income

Variable	n	X	SD	df	F	Sig
Less than 7,000 Baht	29	1.17	.36	3	1.873	.138
7,000 – 14,000 Baht	38	1.18	.45			
14,001 – 28,000 Baht	29	1.08	.45			
More than 28,000 Baht	31	.96	.44			

*The mean difference is significant at the .05 level.

Hypothesis 5: People who have better solid-waste separation knowledge and people who have a poorer knowledge are not different in solid-waste separation behavior.

To test hypothesis 5, the Pearson's correlation test was employed in order to find out if there was a significant correlation of the respondents who have better solid-waste separation knowledge and those who have poorer knowledge in the frequency of solid-waste separation behavior. The Mean(X) of knowledge of solid-waste separation (8.46) and behaviors (18.83) were tested to investigate if there was a relationship between them.

Table 9. Mean, Standard Deviation and Correlation between the Knowledge of Solid-Waste Separation and the Behavior

Variable		X	SD	Knowledge of solid-waste separation	Solid-waste behavior
Knowledge of solid-waste separation	Pearson Correlation	8.46	1.876	1	.226(**)
	Sig. (1-tailed)				.005
	N			127	127
Solid-waste behavior	Pearson Correlation	18.83	7.437	.226(**)	1
	Sig. (1-tailed)			.005	
	N			127	127

**Correlation is significant at the 0.01 level (1-tailed).

According to Table 9, it was found that there was a significant difference in the behavior of respondents who have more knowledge about solid-waste separation and those who have less knowledge at level 0.01. The correlation result value was .226 which was the positive number closing to value of 0, so it could be interpreted that the variable of knowledge of solid-waste separation and the variable of behavior had the low correlation in the same direction. So, even if respondents had more knowledge of solid-waste separation, they might not do the solid-waste separation frequently.

The findings of the study will be summarized and discussed in the next chapter.