CHAPTER IV

RESULTS AND DISCUSSION

Results

Results of this study are presented into 4 parts:

Part 1: Demographics of sanitation workers

Part 2: Level of knowledge on solid waste separation management

Part 3: Media exposure of the Kasetsart University sanitation workers at Bangkhen Campus

Part 4: Level of awareness on solid waste separation management

Part 5: Hypotheses testing

Part 1

Demographics of sanitation workers

Results are presented in Table 3.

Table 3 Demographics of sanitation workers at Kasetsart University, Bangkhen Campus

N=209

Demographics		Number	Percent
Sex	Male	38	18.20
	Female	171	81.80
Age	25-35 years old	32	15.31
	36-45 years old	69	33.01
	46-55 years old	89	42.58
	More than 56 years old	19	9.10

Table 3 (Continued)

N=209

Demographics		Number	Percent
Type of employment	Permanent	71	34.00
	Temporary	71	34.00
	Outsourcing company	67	32.00
Education	Primary school	122	58.40
	Secondary school	59	28.20
	High school	26	12.40
	Vocational school	2	1.00
Length of working experience	Less than 1 year	33	15.80
	1-5 years	86	41.10
	6-10 years	29	13.90
	11-15 years	19	9.10
	16-20 years	10	4.80
	More than 21 years	32	15.30

Table 3 shows that 81.80% of the sanitation workers were female and 18.20% were male. Most of them were 46-55 years old (42.58%). There were equal number of permanent sanitation workers and temporary sanitation workers at 34% while outsourcing company sanitation workers were at 32.10%. Most of them at 58.40% had primary school education, followed by secondary school at 28.20% and less than 1% graduated in vocational school. Around 41% have worked for Kasetsart University as sanitation worker for 1-5 years, 15.30% have worked more than 21 years and only 4.80% have worked as sanitation workers for 16-20 years.

Part 2

Level of knowledge on solid waste separation management

Knowledge on solid waste separation management classified by meaning of solid waste, type of solid waste, source of solid waste, method to get rid of solid waste and benefit on get rid of solid waste in a correct way is shown on Table 4.

Table 4 Knowledge on solid waste separation management

Knowledge on Slid Waste Separation Management	Response		Mean	S.D.	Level of Knowledge
	True	False			
	Number (%)				
Meaning of solid waste					
1. Solid waste means left over food, dung, carcass, dust, plastic bag, food vessel etc.	198 (94.7)	11 (5.3)	0.95	0.22	High
2. Organic waste means waste which decomposes naturally - such as left over food, carcass, leaf etc.	7 (3.3)	202 (96.7)	0.97	0.18	High
3. Reuse means to use materials or objects in good condition again.	28 (13.4)	181 (86.6)	0.87	0.34	High
4. Recycle means to put used objects or materials through a special process, so that they can be used again.	198 (94.7)	11 (5.3)	0.95	0.22	High
Total	785 (93.9)	51 (6.1)	0.93	0.13	High
Type of solid waste					
1. Standard light bulbs, fluorescent light bulbs and batteries are hazardous waste.	200 (98.7)	9 (4.3)	0.96	0.20	High

Table 4 (Continued)

Knowledge on Slid Waste Separation Management	Response		Mean	S.D.	Level of Knowledge
	True	False			
	Number (%)				
2. Plastic, glass and metal are recycled waste.	194 (92.8)	15 (7.2)	0.93	0.26	High
3. Left over food is non hazardous waste. It can be discarded without separation.	89 (42.6)	120 (57.4)	0.43	0.50	Moderate
4. Batteries, light bulbs and spray cans are hazardous waste. They should be separated from non-hazardous waste.	151 (72.2)	58 (27.8)	0.72	0.45	High
Total	634 (75.8)	202 (24.2)	0.76	0.19	High
Source of solid waste					
1. Waste discarded by clinics and laboratories does not generate germs.	26 (12.4)	183 (87.6)	0.12	0.33	Low
2. Human waste in toilets does not generate germs.	42 (20.1)	167 (79.9)	0.20	0.40	Low
3. Kasetsart University's waste is non hazardous waste, and can be disposed of without separation.	102 (48.8)	107 (51.2)	0.49	0.50	Moderate
4. The faculty's waste can decompose naturally if left undisturbed for a long time.	102 (48.8)	107 (51.2)	0.49	0.50	Moderate
Total	564 (67.5)	272 (32.5)	0.33	0.30	Low
Method to get rid of solid waste					
1. Waste attracts germ carriers such as field rats, cockroaches, houseflies, worms, fruit flies, etc.	198 (94.7)	11 (5.3)	0.95	0.22	High

Table 4 (Continued)

Knowledge on Slid Waste Separation Management	Response		Mean	S.D.	Level of Knowledge
	True	False			
	Number (%)				
2. Recycled material can not be reused because of low quality.	112 (53.6)	97 (46.4)	0.54	0.50	High
3. Unsoiled plastic bags can be reused.	176 (84.2)	33 (15.8)	0.84	0.37	High
4. Embedding is only one method for waste minimization.	158 (75.6)	51 (24.4)	0.76	0.43	High
5. Plastic material should burn because it doesn't cause air pollution.	78 (37.3)	131 (62.7)	0.37	0.48	High
6. Fertilizer cans are classified as hazardous waste, and should be embedded.	175 (83.7)	34 (16.3)	0.84	0.37	High
7. Broken bottles, broken glass and broken bulbs can be discarded with non-hazardous waste.	21 (10.0)	188 (90.0)	0.10	0.30	Low
8. Burning waste is a convenient and rapid method of collecting waste, which doesn't cause air pollution.	68 (32.5)	141 (67.5)	0.33	0.47	Low
9. We can discard chemical bottles and fertilizer cans with other waste but should tie up the waste package.	143 (68.4)	66 (31.6)	0.68	0.47	High
Total	1,129 (60.0)	752 (40.0)	0.60	0.21	Moderate

Table 4 (Continued)

Knowledge on Slid Waste Separation Management	Response		Mean	S.D.	Level of Knowledge
	True	False			
	Number (%)				
Benefit on get rid of solid waste in a correct way					
1. Separating before discarding minimizes waste preserving the environment and preventing dissemination of germs.	200 (95.7)	9 (4.3)	0.96	0.20	High
2. We should eliminate waste every day to protect against dissemination of germs.	203 (97.1)	6 (2.9)	0.97	0.17	High
3. Waste elimination, using correct disposal methods, reduces causes of sickness such as cholera, hemorrhoid fever, diarrhea etc.	205 (98.1)	4 (1.9)	0.98	0.98	High
4. Separating waste before disposal can save energy and money.	202 (96.7)	7 (3.3)	0.97	0.97	High
Total	810 (3.1)	26 (96.9)	0.97	0.11	High
Grand Total	**3,922 (75.1)**	**1,303 (24.9)**	**0.69**	**0.11**	**High**

Table 4 shows that over all Kasetsart University sanitation workers had high level of knowledge on solid waste separation management.

Sanitation workers had high level of knowledge on the meaning of solid waste. They had high knowledge on meaning of organic waste, followed by meaning of recycled waste and solid waste, respectively. They had high level of knowledge on the type of solid waste. Their level of knowledge on hazardous waste got the highest mean, followed by knowledge on recycled waste. Their level of knowledge on hazardous waste was the lowest.

They had low level of knowledge on the source of solid waste. Their knowledge regarding the source of Kasetsart University's waste and that of faculty's waste was at the highest level. However, their knowledge about waste from clinics and laboratories got the lowest mean.

The sanitation workers had moderate level of knowledge on the method to get rid of solid waste. They had the highest level of knowledge on the matter of method to discard non-hazardous waste and on the method to get rid of plastics, respectively. Meanwhile knowledge of waste attracting germ carriers got the lowest mean.

The level of knowledge on the benefit of the correct way of getting rid of solid waste was high. The sanitation workers had highest level of knowledge in the matter of separating before discarding minimizes waste preserving the environment and preventing dissemination of germs. This was followed by issue of separating waste before disposal can save energy and money. The issue of waste elimination, using correct disposal methods, reduces causes of sickness such as cholera, hemorrhoid fever, diarrhea etc., got the lowest mean.

Table 5 Level of knowledge of Kasetsart University sanitation workers classified by number and percent

Level of Knowledge	Number	Percent
High level	114	54.5
Moderate level	95	45.5
Total	209	100.0

Table 5 shows that there were 114 sanitation workers (54.5%) who had high level of knowledge and 95 sanitation workers (45.5%) with moderate level of knowledge on solid waste separation management.

Part 3

Media exposure of the Kasetsart University sanitation workers at Bangkhen Campus

Table 6 Kasetsart University sanitation workers media exposure on solid waste separation classified by source of media

Source of Media	Number of Time of Media Exposure			
	Never	1-2 times/year	3-4 times/year	More than 4 times/year
	Number (%)			
Kasetsart University's public relations media documents	145 (69.4)	50 (23.9)	5 (2.4)	9 (4.3)
Superior/boss	94 (45.0)	77 (36.8)	18 (8.6)	20 (9.6)
Teacher	116 (55.5)	67 (32.1)	11 (5.3)	15 (7.2)
Colleague	79 (37.8)	73 (34.9)	39 (18.4)	18 (8.6)
Total	434 (51.9)	267 (31.9)	73 (8.7)	62 (7.4)

As presented in Table 6, overall results show half (51.9%) of the sanitation workers were never exposed to media regarding solid waste separation, followed by 1-2 times per year (31.9%) and more than 4 times per year, the lowest at 7.4 percent.

Around 69% of sanitation workers were never exposed to Kasetsart University's public relations media documents on solid waste separation management, 23.9% 1-2 times per year. Only 2.4% were exposed 3-4 times per year to their boss or superior as source of information.

Forty five percent of sanitation workers were never been exposed media to their superior/boss as source of information on solid waste separation while a third at 36.8% were 1-2 times per year only 2.4% were exposed 3-4 times per year to their boss or superior as source of information .

Most of the sanitation workers at 55.5% were never been exposed to teacher as source of information on waste separation management while 32.1% were exposed to teacher 1-2 times per year. Very few at 7.2% were exposed to teacher as information source more than 4 times per year.

A third (37.8%) of the sanitation workers was never exposed to their colleagues as media source of information on waste separation management. Although less number at 34.9% were exposed to their colleague 1-2 times per year.

Table 7 Media exposure of Kasetsart University sanitation workers on solid waste separation management classified by number and percentage

Number of Time	Number	Percent
Never	80	38.3
1-2 times/year	103	49.3
3-4 times/year	13	6.2
More than 4 times/year	13	6.2
Total	209	100.0

Table 7 shows that most of the sanitation workers at 49.3% were exposed to different media source as source of information on waste separation management. This was followed closely by zero or never exposure. Only 6.2% were exposed to media more than 4 times per year.

Table 8 The effect of media source on solid waste separation behavior of Kasetsart University sanitation worker

Source of Media	Effect on Solid Waste Separation Behavior			Mean	S.D.	Level of Effect
	High	Moderate	Low			
	Number (%)					
Kasetsart University's public relations media documents	27 (12.9)	34 (16.3)	148 (70.8)	1.42	0.71	Low
Superior/boss	46 (22.0)	66 (31.6)	97 (46.4)			
Teacher	37 (17.7)	59 (28.2)	113 (54.1)	1.64	0.77	Low
Colleague	55 (26.3)	74 (35.4)	80 (38.3)	1.88	0.80	Moderate
Total	165 (19.7)	233 (27.9)	438 (52.4)	1.62	0.72	Low

The overall findings indicate that media exposure had low level effect on solid waste separation behavior of Kasetsart University sanitation worker (Table 8).

Kasetsart University's public relations media documents and teacher as media or information source had low level of effect on solid waste separation behavior of Kasetsart university sanitation workers. Meanwhile superior/boss and colleague as media source had moderate level effect on solid waste separation behavior.

Part 4

Level of awareness on solid waste separation management

Table 9 Level of awareness on solid waste separation management of the Kasetsart University sanitation workers classified by item

Item	Score of Awareness			Mean	S.D.	Level of Awareness
	Agree	Not sure	Disagree			
	Number (%)					
Performance						
1. You can develop Kasetsart University by separating waste in the right method.	150 (71.8)	50 (23.9)	9 (4.3)	2.67	0.55	High
2. Currently, you discard waste without separation.	20 (9.6)	82 (39.2)	107 (51.2)	1.58	0.66	Low
3. Other staff in your division encourages you to undertake waste separation training.	64 (30.6)	79 (37.8)	66 (31.6)	1.99	0.79	Moderate
4. Your division has color separation bin by type of waste.	109 (52.2)	69 (33.0)	31 (14.8)	2.37	0.73	High
5. Waste separation before disposal can reduce waste volume.	192 (91.9)	14 (6.7)	3 (1.4)	2.90	0.34	High
6. You separate plastic bottles, paper and metal because they can sell.	187 (89.5)	16 (7.7)	6 (2.9)	2.87	0.42	High

Table 9 (Continued)

Item	Score of Awareness			Mean	S.D.	Level of Awareness
	Agree	Not sure	Disagree			
	Number (%)					
7. You don't have much time for separating waste.	58 (27.8)	37 (17.7)	114 (54.5)	1.73	0.87	Moderate
8. You separate waste using the correct method every day.	132 (63.2)	67 (32.1)	10 (4.8)	2.58	0.58	High
9. You separate human waste in toilets because they are soiled.	165 (78.9)	24 (11.5)	20 (9.6)	2.69	0.64	High
10. Waste separation is a waste of time and complicated.	25 (12)	44 (21.1)	140 (67)	1.45	0.70	Low
11. If plastic bottles, paper and metal can't sell, you will not separate them.	105 (50.2)	49 (23.4)	55 (26.3)	2.24	0.84	Moderate
12. To pile waste somewhere is the correct method for separating waste.	155 (74.2)	19 (9.1)	35 (16.7)	2.57	0.76	High
Total	1,362 (54.3)	550 (21.9)	596 (23.8)	2.31	0.21	Moderate
Comprehension						
1. Waste separation is the Vehicle, Building and Physical Plant Division staff's duty; it's not your duty.	34 (16.3)	42 (20.1)	133 (63.6)	1.53	0.76	Low

Table 9 (Continued)

Item	Score of Awareness			Mean	S.D.	Level of Awareness
	Agree	Not sure	Disagree			
	Number (%)					
2. Sanitation workers are the most important people in reducing waste volume.	188 (90)	18 (8.6)	3 (1.4)	2.89	0.36	High
3. You have too many tasks, so new sanitation workers should be employed to look after waste separation.	62 (29.7)	36 (17.2)	111 (53.1)	1.77	0.88	Moderate
4. You are interested in waste separation news and always read it	137 (65.6)	63 (30.1)	9 (4.3)	2.61	0.57	High
5. Waste from the separation process can be transformed to other products.	164 (78.5)	28 (13.4)	17 (8.1)	2.75	0.94	High
6. You never receive Kasetsart University's public relations documents about the correct method of waste separation	107 (51.2)	60 (28.7)	42 (20.1)	2.31	0.79	Moderate
7. You have to separate waste as instructed by your superior/boss	17 (8.1)	44 (21.1)	148 (70.8)	1.37	0.63	Low
8. It's time to cooperate in waste separation using the correct method.	186 (89)	18 (8.6)	5 (2.4)	2.87	0.41	High

Table 9 (Continued)

Item	Score of Awareness			Mean	S.D.	Level of Awareness
	Agree	Not sure	Disagree			
	Number (%)					
9. Sanitation workers should have knowledge about the correct method of separating waste.	169 (80.9)	33 (15.8)	7 (3.3)	2.78	0.49	High
10. You don't want to receive waste separation news because it's not related to your duty.	30 (14.4)	57 (27.3)	122 (58.4)	1.56	0.73	Low
11. You don't want to separate waste because other staff can do it.	56 (26.8)	59 (28.2)	94 (45.0)	1.82	0.83	Moderate
12. You are willing to participate in waste separation training courses.	180 (86.1)	20 (9.6)	9 (4.3)	2.83	0.49	High
Total	1,330 (53.0)	478 (19.1)	700 (27.9)	2.26	0.22	Moderate
Grand total	**2,692 (53.7)**	**1,028 (20.5)**	**1,296 (25.8)**	**2.28**	**0.18**	**Moderate**

Table 9 shows the interpretation of awareness classified by items. The overall results of interpretation show that the respondents had moderate level of awareness on solid waste separation.

The respondents' performance on solid waste separation management was at moderate level. The highest level was on 'waste separation before disposal can reduce waste volume', followed by negative awareness question on 'separate plastic bottles, paper and metal because they can sell'. The lowest level on solid waste separation management was on the waste separation as a waste of time and complicated.

In terms of comprehension on solid waste separation management the level of awareness of Kasetsart University sanitation workers was moderate. The highest level of awareness was on 'sanitation workers being the most important people in reducing waste volume', followed by 'It's time to cooperate in waste separation using the correct method'. The lowest level of awareness on solid waste separation management was on 'the sanitation workers have to separate waste as instructed by your superior/boss'.

Table 10 Level of awareness on solid waste separation management of the Kasetsart University sanitation workers

Item	Score of Awareness			Mean	S.D.	Level of Awareness
	Agree	Not sure	Disagree			
	Number (%)					
Performance	1,362 (54.3)	550 (21.9)	596 (23.8)	2.31	0.21	Moderate
Comprehension	1,330 (53.0)	478 (19.1)	700 (27.9)	2.26	0.22	Moderate
Total	2,692 (53.7)	1,028 (20.5)	1,296 (25.8)	2.28	0.18	Moderate

Table 10 shows that the sanitation workers had moderate level of awareness on solid waste separation management both in performance and comprehension items.

Table 11 Level of awareness classified by number and percent

Level of Awareness	Number	Percent
High level	62	29.7
Moderate level	147	70.3
Total	209	100.0

Table 11 shows that of 147 sanitation workers (70.3%) had moderate level of awareness on solid waste separation, and 62 sanitation workers (29.7%) had high level of awareness.

Part 5

Hypotheses Testing

1. Relationship between demographics of the Kasetsart University sanitation workers and awareness on solid waste separation management

1.1 Relationship between sex and awareness on solid waste separation management

Table 12 Relationship between sex and awareness on solid waste separation management

Sex	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Male	24 (11.5)	14 (6.7)	38	1.147	1	0.284
Female	123 (58.9)	48 (22.9)	171			
Total	147	62	209			

Table 12 shows there was no relationship between sex and awareness on solid waste separation management.

1.2 Relationship between age and awareness on solid waste separation management

Table 13 Relationship between age and awareness on solid waste separation management

Age	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
25-35 years old	26 (12.4)	6 (2.8)	32	3.311	3	0.346
36-45 years old	46 (22.0)	23 (11.0)	69			
46-55 years old	60 (28.7)	29 (13.9)	89			
Higher than 46	15 (7.2)	4 (2.0)	19			
Total	147	62	209			

Table 13 shows there was no relationship between age and awareness on solid waste separation management.

1.3 Relationship between type of employment and awareness on solid waste separation management

Table 14 Relationship between type of employment and awareness on solid waste separation management

Type of Employment	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Permanent	57 (27.3)	14 (6.7)	71	6.109	2	0.047*
Temporary	49 (23.4)	22 (10.6)	71			
Outsourcing company	41 (19.6)	26 (12.4)	67			
Total	147	62	209			

* 0.05 level of significance

Table 14 shows there was relationship between type of employment and awareness on solid waste separation management at 0.05 level of significance.

1.4 Relationship between education and awareness on solid waste separation management

Table 15 Relationship between education and awareness on solid waste separation management

Education	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Primary school	115 (55.02)	13 (6.22)	128	3.882	2	0.144
Secondary school	42 (20.10)	11 (5.26)	53			
High school and Vocational School	25 (11.96)	3 (1.44)	28			
Total	182	27	209			

Table 15 shows there was no relationship between education and awareness on solid waste separation management.

1.5 Relationship between length of working experience and awareness on solid waste separation management

Table 16 Relationship between length of working experience and awareness on solid waste separation management

Length of Experience	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Less than 1 year	27 (12.9)	6 (2.8)	33	4.346	5	0.501
1-5 years	56 (26.8)	30 (14.4)	86			
6-10 years	19 (9.1)	10 (4.8)	29			
11-15 years	13 (6.3)	6 (2.8)	19			
16-20 years	8 (3.9)	2 (0.9)	10			
More than 21 years	24 (11.5)	8 (3.8)	32			
Total	147	62	209			

Table 16 shows there was no relationship between length of working experience and awareness on solid waste separation management.

2. Relationship between level of knowledge of the Kasetsart University sanitation workers and awareness on solid waste separation management

Table 17 Relationship between level of knowledge and awareness on solid waste separation management

Level of Knowledge	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Moderate level	74 (35.4)	21 (10.0)	95	4.771	1	0.029*
High level	73 (35.0)	41 (19.6)	114			
Total	147	62	209			

* 0.05 level of significance

Table 17 shows there was relationship between level of knowledge and awareness on solid waste separation management at 0.05 level of significance.

3. Relationship between Kasetsart University media exposure of the Kasetsart University sanitation workers and awareness on solid waste separation management

3.1 Relationship between media exposure and awareness on solid waste separation management

Table 18 Relationship between media exposure and awareness on solid waste separation management

Number of Time	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Never	60 (28.7)	20 (9.6)	80	11.395	3	0.010*
1-2 times/year	76 (36.4)	27 (12.9)	103			
3-4 times/year	6 (2.8)	7 (3.3)	13			
More than 4 times/year	5 (2.4)	8 (3.9)	13			
Total	147	62	209			

* 0.05 level of significance

Table 18 shows there was relationship between Kasetsart University media exposure and awareness on solid waste separation management at 0.05 level of significance.

3.2 Relationship between Kasetsart University's public relations media documents exposure and awareness on solid waste separation management

Table 19 Relationship between Kasetsart University's public relations media documents exposure and awareness on solid waste separation management

Number of Time	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Never	101 (48.3)	44 (21.1)	145	0.490	2	0.783
1-2 times/year	35 (16.8)	15 (7.1)	50			
More than 3 times/year	11 (5.3)	3 (1.4)	14			
Total	147	62	209			

Table 19 shows there was no relationship between Kasetsart University's public relations media documents exposure and awareness on solid waste separation management.

3.3 Relationship between superior/boss exposure and awareness on solid waste separation management

Table 20 Relationship between superior/boss exposure and awareness on solid waste separation management

Number of Time	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Never	75 (35.8)	19 (9.1)	94	8.784	3	0.032*
1-2 times/year	51 (24.4)	26 (12.4)	77			
3-4 times/year	10 (4.8)	8 (3.9)	18			
More than 4 times/year	11 (5.3)	9 (4.3)	20			
Total	147	62	209			

* 0.05 level of significance

Table 20 shows there was relationship between superior/boss exposure and awareness on solid waste separation management at 0.05 level of significance.

3.4 Relationship between teacher exposure and awareness on solid waste separation management

Table 21 Relationship between teacher exposure and awareness on solid waste separation management

Number of Time	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Never	89 (42.6)	27 (12.9)	116	12.382	3	0.006*
1-2 times/year	47 (22.4)	20 (9.6)	67			
3-4 times/year	4 (2.0)	7 (3.3)	11			
More than 4 times/year	7 (3.3)	8 (3.9)	15			
Total	147	62	209			

* 0.05 level of significance

Table 21 shows there was relationship between teacher exposure and awareness on solid waste separation management at 0.05 level of significance.

3.5 Relationship between colleague exposure and awareness on solid waste separation management

Table 22 Relationship between colleague exposure and awareness on solid waste separation management

Number of Time	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
Never	59 (28.2)	20 (9.6)	79	10.376	3	0.016*
1-2 times/year	55 (26.3)	18 (8.6)	73			
3-4 times/year	26 (12.4)	13 (6.3)	39			
More than 4 times/year	7 (3.3)	11 (5.3)	18			
Total	147	62	209			

* 0.05 level of significance

Table 22 shows there was relationship between colleague exposure and awareness on solid waste separation management at 0.05 level of significance.

3.6 Relationship between level of effect of Kasetsart University media exposure on solid waste separation behavior and awareness on solid waste separation management

Table 23 Relationship between level of effect of Kasetsart University media exposure on solid waste separation behavior and awareness on solid waste separation management

Level of Effect	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
High level	16 (7.7)	14 (6.7)	30	14.430	2	0.001*
Moderate level	42 (20.0)	28 (13.4)	70			
Low level	89 (42.6)	20 (9.6)	109			
Total	147	62	209			

* 0.05 level of significance

Table 23 shows there was relationship between level of effect of Kasetsart University media exposure on solid waste separation behavior and awareness on solid waste separation management at 0.05 of significance.

3.7 Relationship between level of effect of Kasetsart University's public relation media documents and awareness on solid waste separation management

Table 24 Relationship between level of effect of Kasetsart University's public relation media documents and awareness on solid waste separation management

Level of Effect	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
High level	20 (9.6)	7 (3.3)	27	1.105	2	0.576
Moderate level	26 (12.4)	8 (3.9)	34			
Low level	101 (48.3)	47 (22.5)	148			
Total	147	62	209			

Table 24 shows there was no relationship between level of effect of Kasetsart University's public relation media documents and awareness on solid waste separation management.

3.8 Relationship between level of effect of superior/boss exposure and awareness on solid waste separation management

Table 25 Relationship between level of effect of superior/boss exposure and awareness on solid waste separation management

Level of Effect	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
High level	25 (12.0)	21 (10.1)	46	18.005	2	0.000*
Moderate level	40 (19.1)	26 (12.4)	66			
Low level	82 (39.2)	15 (7.2)	97			
Total	147	62	209			

* 0.05 level of significance

Table 25 shows there was relationship between level of effect of superior/boss exposure and awareness on solid waste separation management at 0.05 level of significance.

3.9 Relationship between level of effect of teacher exposure and awareness on solid waste separation management

Table 26 Relationship between level of effect of teacher exposure and awareness on solid waste separation management

Level of Effect	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
High level	18 (8.6)	19 (9.1)	37	13.542	2	0.001*
Moderate level	39 (18.7)	20 (9.6)	59			
Low level	90 (43.0)	23 (11.0)	113			
Total	147	62	209			

* 0.05 level of significance

Table 26 shows there was the relationship between level of effect of teacher exposure and awareness on solid waste separation management at 0.05 level of significance.

3.10 Relationship between level of effect of colleague exposure and awareness on solid waste separation management

Table 27 Relationship between level of effect of colleague exposure and awareness on solid waste separation management

Level of Effect	Level of Awareness		Total	χ^2	df	p
	Moderate level	High level				
	Number (%)					
High level	35 (16.8)	20 (9.6)	55	2.017	2	0.365
Moderate level	52 (24.7)	22 (10.6)	74			
Low level	60 (28.7)	20 (9.6)	80			
Total	147	62	209			

Table 27 shows there was no the relationship between level of effect of colleague exposure and awareness on solid waste separation management.

Discussion

The study of Awareness on the Kasetsart University Sanitation Workers at Bangkhen Campus towards Solid Waste Separation Management can be discussed as follows:

Demographics of sanitation workers

Results obtained indicate that there were more female sanitation workers (81.80%) as cleaning works are culturally and traditionally considered as women's job. Moreover, female workers are usually more skilled and more conscientious in cleaning than male. The high number

of outsourced employees shows the changing trend in employment system of agencies including Kasetsart University. Employment of workers through outsourcing companies will reduce the employer's manpower cost as the agency does not have to pay for benefits, i.e. retirement, medical, etc. This increase in number of outsourced sanitation workers is also reflected in the years of working experience of these workers where in the majority was found to have worked with the university for not more than 5 years. As most of the sanitation workers had only primary education, they needed to be given training on solid waste separation management if this program on effective solid waste separation has to succeed. Furthermore, these sanitation workers need to be given more information through exposure to various information sources as to give them more knowledge on proper waste separation management.

Level of knowledge on solid waste separation management

The results of level of knowledge towards solid waste separation found that the sanitation workers had high level of knowledge on solid waste separation. Analysis on classification by items found that the Kasetsart University sanitation workers had high level of knowledge on meaning of solid waste and types of solid waste due to these are general information, easy to understand. Sanitation workers had high level of benefit of getting rid of solid waste in a correct way. The sanitation workers also knew that they had to separate waste because they can get extra income by selling some recyclable waste once separated e.g. plastic, glass and metal. They had low level on source of solid waste and moderate level on method to get rid of solid waste due to their level of education and complicated information on solid waste separation management. However, they still need to be trained on proper since the result of the study found that they had low level of knowledge on source of solid waste.

Media exposure of the Kasetsart University sanitation workers at Bangkhen Campus

The results of number of time of media exposure and effect from source of media towards solid waste separation found that more than half (69.4%) of sanitation workers were never exposed to Kasetsart University media especially to Kasetsart University's public relations media documents. Nevertheless, this low level of media exposure to Kasetsart University was not

a factor to prevent them from having high level of knowledge on solid waste separation management.

The sanitation workers had the chance of being exposed to their superior/boss due to superior/boss as source of information as their boss evaluate the sanitation workers' performance, income or welfare. Furthermore, it is the superior/boss that gives order and direction on solid waste separation to the sanitation workers. The results also show that the sanitation workers exposure to their colleagues as media source was at high level because it was with their colleagues that they interchange the opinion or knowledge having similar experience as sanitation worker.

Kasetsart University's public relations media documents had the lowest effect to sanitation workers in term of solid waste separation management as they were never exposed to this media directly. Most of them had primary school education that it takes them a lot of time to comprehend the matter on solid waste separation management as well as the technical terms.

Level of awareness on solid waste separation management

The results showed that level of awareness of sanitation workers towards solid waste separation were moderate. Aspect analysis found that the sanitation workers also had moderate level on performance because most of them had working of experience only 1-5 years and 15.8 percent even have worked for less than 1 year which resulted to lack of working experience and skill on solid waste separation management.

Hypotheses testing

The results of findings are shown as follow:

Type of employment was related to level of awareness towards solid waste separation management. Type of employment was divided into 3 groups; permanent sanitation workers, temporary sanitation workers and outsourcing company sanitation workers. The differences in

factors that go with the types of employment e.g. income, office hours and welfare had affected solid waste separation management.

Knowledge was related to level of awareness towards solid waste separation management especially knowledge on source of solid waste and method to get rid of solid waste.

Exposure of Kasetsart University sanitation workers to different media sources such as Kasetsart University media, superior/boss, teacher and colleagues had relationship towards solid waste separation management. Superior/boss as well as colleagues was found to have the highest effect on the sanitation workers and the level of awareness to solid waste separation management. This is because these are the people that had the most interaction with the sanitation workers.