Residents' Awareness, Attitudes and Perceptions of Household Hazardous Waste Management in Pa-payom, Phatthalung
ความรู้ ทัศนคติ และการรับรู้ของประชาชนในการจัดการขยะอันตรายในครัวเรือน ในอำเภอป่าพะยอม จังหวัดพัทลุง

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Abstract

This research investigates households' hazardous waste management awareness, attitudes and perceptions of residents in four sub-districts, Pa-payom District, Phatthalung Province, Thailand. A descriptive cross-sectional design was administered to 253 respondents purposively sampled. This study collected data during October 2017 to July 2018 using a questionnaire. The results also indicate that 121 (47.83%) participants had moderate awareness while 59 (23.32%) had low level of awareness on hazardous waste management. Sex (P=.012), age (P=.009), education levels (P<.001), and residential type (P=.018) statistically and significantly influenced their awareness towards household hazardous waste management. Sex (P=.023), age (P<.001), education (P=.002), and residential type (P=.011) statistically and significantly related with their attitudes towards household hazardous waste management. Sex (P=.005), age (P=.003), education (P=.024), and residential type (P<0.001) statistically and significantly related with their awareness of household hazardous waste management. In addition, age (P=.003), educational background (P=.021), and residential type (P<.001) statistically and significantly related with their management behaviours of household hazardous waste. Thus, there is a need for raising the residents' awareness among the on household hazardous waste management disseminating relevant information, as well as taking parts in related offices are required.

Keywords: Awareness, Attitude, Perception, Household Hazardous Waste

บทคัดย่อ

การวิจัยครั้งนี้เป็นการศึกษาความรู้ ทัศนคติและการรับรู้ของประชาชนในการจัดการขยะอันตรายในครัวเรือน ใน 4 ตำบล อำเภอป่าพะยอม จังหวัดพัทลุง ประเทศไทย เป็นการวิจัยแบบตัดขวางในประชาชนที่เข้าร่วมจำนวน 253 คนที่คัดเลือกแบบเจาะจง เก็บตัวอย่างข้อมูลระหว่างเดือนตุลาคม 2017 ถึง มิถุนายน 2018 โดยใช้แบบสอบถาม ผลการศึกษา พบว่า 121 คน (47.83%) ของผู้เข้าร่วมมีระดับความรู้เกี่ยวกับขยะอันตรายระดับกลาง ขณะเดียวกัน 59 คน (23.32%) ของผู้เข้าร่วมมีระดับความรู้เกี่ยวกับขยะอันตรายในระดับต่ำ เพศ (P=.012) อายุ (P=.009) ระดับการศึกษา (P<.001) และลักษณะที่พักอาศัย (P=.018) มีความสัมพันธ์กับความรู้ในการจัดการขยะอันตรายอย่างมีนัยสำคัญทางสถิติ เพศ (P=.023) อายุ (P<.001) ระดับการศึกษา (P=.002) และลักษณะที่พักอาศัย (P=.011) มีความสัมพันธ์กับทัศนคติในการจัดการขยะอันตรายอย่างมีนัยสำคัญทางสถิติ เพศ (P=.005) อายุ (P=.003) ระดับการศึกษา (P=.024) และลักษณะที่พักอาศัย (P<.001) มีความสัมพันธ์กับการรับรู้ในการจัดการขยะอันตรายอย่างมีนัยสำคัญทางสถิติ อายุ (P=.003) ระดับการศึกษา (P=.021) และลักษณะที่พักอาศัย (P<.001) มีความสัมพันธ์กับพฤติกรรมในการจัดการขยะอันตรายอย่างมีนัยสำคัญทางสถิติ ดังนั้น การส่งเสริมความรู้ในการจัดการขยะอันตรายในครัวเรือนเป็นสิ่งที่มีความจำเป็นพอ ๆ กับ การเผยแพร่ และการมีส่วนร่วมกับองค์กร

คำสำคัญ: ความรู้ ทัศนคติ การรับรู้ ขยะอันตรายในครัวเรือน

Introduction

The EPA (2017) defined; a hazardous waste is a waste with properties that can be potentially hazardous to human health or the environment when they are improperly managed as “hazardous”. In addition, a “toxic” waste is only waste that, when ingested or absorbed, is harmful or fatal to living organisms. One of environmental problem issuers in Association of Southeast Asian Nations (ASEAN) countries is hazardous waste. This is as a consequence of the community houses, which produce the hazardous inorganic and chemical waste. According to the World Bank, the total volume of municipal solid waste will more than double by the year 2025 compared with that produced in 1999 (an average of 150 litres per capita per day for developing countries). Toxic chemicals and the generation of hazardous waste will be increased (UNEP, 2018).

Many countries in ASEAN are in the early stages of industrialization and many of their industries lack the capital needed to invest in waste treatment systems or to replace old equipment with new technologies. The Ministry of Industry’s Department of Industrial Works (DIW) plans to establish 15 regional waste management facilities throughout the country as detailed in its five-year waste management plan for 2015–2019 (Lamonphet, 2018). In addition, household hazardous waste products are those that can catch fire, react, explode; corrosives such as oils, batteries, paints, cleaners, and pesticides can contain hazardous ingredients and require special care when you want to dispose of them (USEPA, 2018). The Pollution Control Department (PCD) under the Ministry of Science, Technology, and Environment (Pollution Control Department, 2018) reported that the total volume of household hazardous waste generated in Thailand in 2018 was 618,749 tons. Treatment and disposal facilities are adequate about 60,619 tons (9.80 %) that increasing volume of toxic waste generated.

Household hazardous waste is the unwanted portions of those products that contain hazardous ingredients: automotive, cleaning and polishing, paint and related solvents, pesticides, and miscellaneous items (Bowen, 1998). Household hazardous substances found in homes can pose a potential risk to people if left in/around the home. Household hazardous waste can threaten to have adverse health effects on humans who are exposed to battery acid, aerosols, and some toxic gases, including acute effects, such as acid burns, headaches, fatigue, burning eyes, runny nose, and rashes (Tchobanoglous, & Kreith, 2002) and chronic health effects from being exposed over a long-term period to automotive products, solvents, oil-based paints, or pesticides (Larini, 1997; Wollf, 2000). In the household, food, drinking water,

indoor and outdoor air can be contaminated by toxic agents that are found in pesticides, aerosols, some gases, and heavy metals (Järup (2003). Neurological effects, asthma, and allergies can occur in children who are exposed to pesticides (Lockwood, 2000; Sheiner, Sheiner, Hammel, Potashnik, & Carel, 2003). Organochlorine insecticide can accumulate along the food chain, and cause an ecological and public health problem (Jayaraj, 2017).

Knowledge and attitude has been seen as a key variable affecting households hazardous waste action (Dhokhikah, Trihadiningrum, & Sunaryo 2015; Kallgren, & Wood, 1986; Barloa, Lapie, & Cruz, 2016; Olorunfemi, 2009). It has been debated that higher levels of environmentally appropriate knowledge play a significant role in qualifying environmental behavior (Oskamp et al, 1991; Vining, & Ebreo, 1990). In addition, perceived pollution is associated with perceptions of health risks that also associated with several health outcomes (Claeson, Lidén, Nordin, & Nordin, 2013; WHO, 2009). In southern Thailand, household hazardous waste is a complex issue and has been a major concern on the priority list of successive governments and local authorities. There is little evidence that efforts to manage household hazardous waste are having their expected effect. As well as improving waste management, social and behavioral factors are also important if household hazardous waste management is to be successful. The current study aims to investigate community knowledge, attitude and perception about household hazardous waste management and study the relationship between the knowledge, attitude, and perception of people with the behavior in household waste management. The gap of knowledge in this study, the author have identified for guiding future policy and improvement to the hazardous waste, with an integrated and coordinated effort by local government, the private sector, and the community for improving health and well-being.

Materials and Methods

The study was a descriptive cross-sectional design. The questionnaires were collected from respondents in four community areas in Phatthalung Province, southern Thailand, between October 2017 to July 2018. The study protocol was approved by the Ethics Committee of the Institute of Research and Development, Thaksin University (E 058/2559).

1. Measures

The study questionnaire was given to the 253 persons participating in this study, and 253 completed and returned it, giving a response rate of 100%. The data collected were checked by researchers. The questionnaire was tested for internal consistency and had a very high Cronbach's α value of 0.950. The questionnaire comprised questions on knowledge, attitude, perception and behavior on 40, 10, 10, and 10 items, respectively.

If a knowledge of respondents on hazardous waste score was equal to or greater than 27 to equal score 40, it was high, If a score was equal to or more than 14 to equal to or less than 27 this was moderate, and if a score was equal to or less than 13 this was low.

For the attitude, perception, and behavior of respondents toward hazardous waste variables, cumulative scores were agree, undecided, and disagree, measured on a 3-point Likert scale, scoring 1,2 and 3, respectively.

If the attitude of respondents on hazardous waste an average score was 2.34 to 3.00, it was positive, If an average score was 1.67 to 2.33, it was neutral, and if an average score was 1.00-1.66 this was negative.

If the perception of respondents on hazardous waste an average score was 2.34 to 3.00, it was high, If an average score was 1.67 to 2.33, it was moderate, and if an average score was 1.00-1.66 this was low.

If the behavior of respondents on hazardous waste an average score was 2.34 to 3.00, it was high. If an average score was 1.67 to 2.33, it was moderate,

and if an average score was 1.00-1.66 this was low.

The household head (either male or female depending on who assumed responsibility for the household) or any adult members of the household above 18 years of age for selected households were interviewed using the questionnaires.

The questionnaires were distributed among interviewers in a written form. They explained the questions face to face and filled the answer in the questionnaire.

2. Areas sampling

The population included 253 respondents who live in four community areas that are managed by the Local Administrative Organization in Phatthalung province, southern Thailand.

3. Statistics analysis

The data were analyzed by frequencies, Percentages, Chi-square, and Pearson product moment correlation coefficient.

Results

The study presented that over half (152) respondents were females. The mean age (S.D.) of respondents was 39.19 ± 3.87 years (range 20–62 years), the majority of respondents were married (73.10%), and had a secondary school leaving certificate (40.71%). In addition, most respondents (60.87%) live in a detached house and most respondents (30.8%) had 9–12 people living in their household. Moreover, sites of hazardous waste disposal were inappropriated (76.68%) and over one-third of respondents (34.39%) were unsure of hazardous waste management practice.

Knowledge of respondents on hazardous waste Table 1 shows the knowledge of respondents on hazardous waste, the study showed that 121 (47.83%) had moderate knowledge on hazardous waste (range 15 – 26 score, average (S.D.) = 24.58 ± 4.50) , 73 (28.85%) had high knowledge on hazardous waste (range 27 – 38 score, average (S.D.) = 32.5 ± 5.30), and 59 (23.32%) had low knowledge on hazardous waste (range 8-13 score, average (S.D.) = 10.25 ± 2.25) that occurs in households. Table 2 shows the attitude of respondents toward hazardous waste. A majority of the respondents (58.12%) had an overall high level of attitude (2.38 ± 0.59) about hazardous waste management in the household. A total of 203 respondents (80.24%) believed that hazardous waste in the household should be taken seriously and 233 (92.09%) believed that the prevention of health hazards from hazardous waste should be the joint responsibility with the local government organization. Of the 253 respondents, 214 (84.58%) believed education on hazardous waste could reduce the health impact from hazardous waste, and 158 respondents (62.45%) believed that training regarding the disposal of hazardous waste was a necessary part of hazardous waste management. One hundred and eighty-four respondents (72.73%) believed that using personal protective equipment (PPE) can reduce the risk of contamination when coming in contact with hazardous waste, and 215 (84.98%) thought personal hygiene such as washing hands after coming into contact with hazardous waste can reduce the risk of contamination when coming into contact with hazardous waste. A total of 204 respondents (80.63%) believed that separating hazardous waste from general waste is a necessary part of hazardous waste management, while 206 respondents (81.42%) believed that the accumulation of hazardous waste in the household could constitute a health hazard. Some 210 respondents (83%) believed that reusing a container contaminated with chemicals would have adverse health effects, and 204 respondents (80.63%) believed that adverse health effects related to hazardous waste in the household should be reported to a government organization. Perception of respondents of hazardous waste Table 2 shows the perception of respondents to hazardous waste. A majority of the respondents (58.12%) had an overall moderate level of perception (2.32 ± 0.56) about hazardous waste management in the household. In addition, the most of the respondents (50.22%) had an overall moderate level of behavior (2.04 ± 0.29) about hazardous waste management in the household. More than half of the respondents, 174

(68.77%) agreed that hazardous waste disposal is an important problem; 194 respondents (76.68%) agreed that everyone should be responsible for the management of hazardous waste; 192 respondents (75.89%) agreed that hazardous waste can cause disease or illness; 184 respondents (72.72%) agreed on the kinds of diseases (skin irritant, cancer) that can occur as a result of contact with hazardous waste; 175 respondents (69.17%) agreed on which chemicals can enter the body through being absorbed by the skin, inhaled, and ingested; 59 respondents (23.32%) agreed that you may be exposed to radiation when you come into contact with hazardous waste; 98 respondents (38.73%) agreed that you may be exposed to heavy metals when you come into contact with hazardous waste; 183 respondents (72.33%) agreed that hazardous waste disposal should be more of a concern than general waste disposal; 78 respondents (30.83%) agreed that harm may occur if batteries are collected in the household; and 182 respondents (71.94%) agreed that respondents should concern themselves with the management of E-waste in the household.

Table 3 shows that there was a significant association between knowledge, attitude and perception, and the socio-demographic characteristics of respondents.

In this study, all socio-demographic variables and knowledge of respondents were statistically significantly associated at .05 level, including sex (P=.012), age (P=.009), education (P<.001), and residential unit (P=.018) on household hazardous waste management.

In addition, sex (P=.023), age (P<.001), marital status (P=.021), education (P=.002), and residential unit (P=.011) were statistically significantly associated with the attitude of respondents toward household hazardous waste management.

The perception of respondents of household hazardous waste management was statistically significantly associated at .05 level, including sex (P=.005), age (P=.003), education (P=.024), and residential unit (P<.001).

Table 4 shows through Pearson product moment correlation coefficient that knowledge (r=0.356), attitude (r=0.507), and perception (r=0.375) of people related to the behavior of people. These showed a significant positive correlation and exhibited a moderate direction at the .05 level of significance.

Discussion

In this study, socio-demographic variables showed a significant association between knowledge, attitude, and perception of respondents on household hazardous waste management. This result is similar to many other researches (Olorunfemi, 2009; Garang, Wilkister, & Millicent, 2016; Laabar, Siriwang, & Robson, 2012; Babaei et al., 2015), which have reported that socio-economic characteristics such as sex, age, household size, education, occupation and length of stay in an area are associated with people's knowledge of attitude toward and perception of health hazards.

Age has been statistically significantly associated with the respondent's knowledge, attitude, and perception on household hazardous waste. This result differs from studies by Njagi et al., (2013), which showed that a participant's age was not associated with knowledge, attitude, and perception. In this study, respondents who are aged 50 and above have low knowledge of (11.47%), a negative attitude toward (8.30%), and low perception (14.63%) of household hazardous waste. The lack of information about household hazardous waste management such as the risk of accidents in the house, collection points available in the community or disposal of household hazardous waste, and other actions to raise awareness of the respondents influenced the results obtained in this study. These results, which are supported by many studies (Njagi et al., 2013; Paim, 2011; WHO, 2018; Vassanadumrongdee, & Kittipongvises, 2018), show that direct action within the homes in a community can positively influence household hazardous waste management.

Level of education is shown to be associated

with the respondent's knowledge, attitude, and perception. The respondents who have secondary level education have low knowledge (21.32%), a negative attitude (17.40%), and low perception (18.96 %) of household hazardous waste management. This finding is supported by Njagi et al., (2013), who reported that level of education has been shown to influence a participant's knowledge, attitude, and perceptions, and Kariyawasam, Jayasinghe-Mudalige , & Weerahewa (2006), who reported the level of education had a significant association with consumer attitude and perceptions. Thus, many studies have suggested a need for improving the knowledge of waste management (Dhokhikah, Trihadiningrum, & Sunaryo, 2015; Kallgren, & Wood, 1986; Indhira, 2015; Kumar, & Nandini, 2013; Khan, 2015; Jayasubramanian, 2015). In this study, 194 respondents (76.68 %) did not agreed that there may be exposed to radiation when contact with hazardous waste and 175 respondents (69.16 %) did not agreed that harm may can occur if batteries are collected in the household because there did not have knowledge that products contain smaller amounts and/or dilute concentrations such as batteries (Richa, 2016), electronic waste (Song, & Li, 2014).

These results indicate that knowledge, attitude, and perception have a significant influence on household hazardous waste management. In developing countries, many studies (Guzman, Reyes, & Loh, 2008; O'Leary, & Walsh, 1995; Chaib, 2014) show that the current practice of managing and handling household management amongst participated respondents indicates the lack of awareness of the dangers and risks involved in unsuitable disposal and handling of household waste management and hazardous waste management systems lack a systematic approach to administer waste management programmes. Thus, the key challenges to manage household hazardous waste in this study including co-disposal with other household wastes, inadequacies in policy frameworks, inadequacies of municipalities to create their own databases on household hazardous waste, inadequate of knowledge on waste management technologies, lack of cooperation of all the stakeholders, inadequate institutional capacity and poor record keeping on how much household waste is generated and the lack of capacity building and awareness. These findings suggest that the local government administration targets improving people knowledge on household hazardous waste problems that could have adverse impact on the economy and well-being of people residents and improve its household hazardous waste collection service as these factors have positive influence on participated respondents in the areas.

Conclusion

This study was found that a majority of the respondents had an overall moderate level of knowledge, high level of attitude, moderate level of perception, and moderate level of behavior about household hazardous waste. Sex, aged, level of education, and residential unit showed a significant association between knowledge, attitude, perception, and behavior of respondents on household hazardous waste management. This study was found that knowledge, attitude, and perception of people related to the behavior of people. The majority of the respondents know household hazardous waste has problems in the environment and adverse health effects on humans. However, there is a need for education programme to increase knowledge among the respondents. In addition, information dissemination, involvement with organizations and associations is a necessity for respondents in this study.

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Conflicts of Interest

The author has no conflicts of interest associated with the material presented in this paper.

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Table 1 Scores and Level of Knowledge of Respondents on Hazardous Waste

Level of knowledge	n	Scores		
		Min	Max	Average ±SD
High (27 – 40 score)	73 (28.85%)	27	38	32.51 ± 5.30
Moderate (14 - < 27 score)	121 (47.83%)	15	26	24.58 ± 4.50
Low (≤13 score)	59 (23.32%)	8	13	10.25± 2.25

Table 2 Percentage of Attitude and Perception of Respondent on Hazardous Waste (n = 253)

Items	Agree (n) (%)	Undecided (n) (%)	Disagree (n) (%)
Attitude of respondent toward hazardous waste (10 items)			
1. Hazardous waste should be taken seriously in the household	203 (80.24)	12 (4.74)	38 (15.02)
2. Prevention of health hazard from hazardous waste is a joint responsibility with the local government organization	233 (92.09)	5 (1.98)	15 (5.93)
3. Hazardous waste education is a necessity for me (such as type of hazardous waste, route of exposure, etc.)	214 (84.58)	32 (12.65)	7 (2.77)
4. Training regarding hazardous waste disposal is a necessity for me	158 (62.45)	68 (26.88)	27 (10.67)
5. Aprons, gloves and face masks should be worn when coming into contact with hazardous product waste	184 (72.73)	61 (24.11)	8 (3.16)
6. Hands should be washed after each contact with hazardous waste in household	215 (84.98)	10 (3.95)	28 (11.07)
7. Safety containers should be separated for hazardous waste and general waste	204 (80.63)	13 (5.14)	36 (14.23)
8. Long-time accumulation of hazardous waste in the household may be a health hazard	206 (81.42)	15 (5.93)	32 (12.65)
9. Reused containers contaminated with chemicals (such as pesticide bottle etc.) could have adverse health effects	210 (83.00)	25 (9.88)	18 (7.12)
10. Adverse health effects related to hazardous waste in the household should be reported to a government organization	204 (80.63)	41 (16.21)	8 (3.16)

Items	Agree (n) (%)	Undecided (n) (%)	Disagree (n) (%)
Perception of respondents of hazardous waste (10 items)			
11. Hazardous waste disposal is important	174 (68.77)	71 (28.07)	8 (3.16)
12. Everyone must be responsible for the management of hazardous waste	194 (76.68)	38 (15.02)	21 (8.30)
13. Hazardous waste can cause disease or illness	192 (75.89)	48 (18.97)	13 (5.14)
14. Kinds of diseases from exposure to hazardous waste include skin irritant, cancer, etc.	184 (72.72)	68 (26.88)	1 (0.40)
15. Hazardous waste can be absorbed through the skin, inhaled, and ingested	175 (69.17)	57 (22.53)	21 (8.30)
16. Exposure to radiation can occur when you come into contact with hazardous waste	59 (23.32)	137 (54.15)	57 (22.53)
17. Exposure to heavy metals can occur when you come into contact with hazardous waste	98 (38.73)	106 (41.90)	49 (19.37)
18. Hazardous waste disposal must treated as more important than general waste disposal	183 (72.33)	22 (8.70)	48 (18.97)
19. General batteries should be a concern if you collect them in your household	78 (30.83)	120 (47.43)	55 (21.74)
20. You should have a plan for the management of E-waste in your household in the future	182 (71.94)	17 (6.72)	54 (21.34)

Table 3 Association between Socio-Demographic Characteristics with Knowledge, Attitude, Perception, and Behavior

Items	Knowledge				Attitude				Perception				Behavior			
	Low	Moderate	High	p-value	Negative	Neutral	Positive	p-value	Low	Moderate	High	p-value	Low	Moderate	High	p-value
Sex																
Male (n=101)	10 (3.96)	68 (26.88)	23 (9.07)	0.012*	18 (7.12)	25 (9.89)	58 (22.93)	0.023*	49 (19.37)	14 (5.54)	38 (15.01)	0.005*	47 (18.58)	12 (4.74)	42 (16.60)	0.072
Female (n=152)	63 (24.91)	53 (20.95)	36 (14.23)		10 (3.96)	43 (17.00)	99 (39.10)		59 (23.32)	42 (16.60)	51 (20.16)		57 (22.53)	40 (15.81)	55 (21.74)	
Aged (years)																
20–29 (n=70)	17 (6.71)	35 (13.84)	18 (7.12)	0.009*	15 (5.92)	35 (13.84)	20 (7.91)	<0.001*	15 (5.92)	25 (9.89)	30 (11.86)	0.003*	10 (3.96)	24 (9.49)	36 (14.23)	0.003*
30–39(n=53)	15 (5.92)	25 (9.89)	13 (5.14)		12 (4.74)	25 (9.89)	16 (6.33)		15 (5.92)	32 (12.64)	6 (2.38)		12 (4.74)	35 (13.84)	6 (2.37)	
40–49(n=73)	12 (4.74)	44 (17.40)	17 (6.71)		28 (11.07)	32 (12.64)	13 (5.13)		21 (8.30)	32 (12.64)	20 (7.91)		12 (4.74)	44 (17.39)	17 (6.72)	
50 and above(n=57)	29 (11.47)	17 (6.72)	11 (4.34)		21 (8.30)	10 (3.96)	26 (10.27)		37 (14.62)	15 (5.92)	5 (1.99)		38 (15.02)	15 (5.93)	4 (1.58)	
Level of education																
Secondary school leaving certificate(n=103)	54 (21.32)	35 (13.84)	14 (5.54)	<0.001*	44 (17.40)	49 (19.37)	10 (3.96)	0.002*	48 (18.96)	49 (19.37)	6 (2.38)	0.024*	49 (19.37)	48 (18.97)	6 (2.37)	0.021*
Diploma certificate(n=65)	17 (6.71)	28 (11.07)	20 (7.91)		10 (3.96)	38 (15.01)	17 (6.71)		15 (5.92)	35 (13.84)	15 (5.92)		12 (4.74)	38 (15.0)	15 (5.93)	
Bachelor's degree(n=85)	2 (0.79)	58 (22.93)	25(9.89)		2 (0.79)	35 (13.84)	48 (18.96)		17 (6.71)	49 (19.37)	19 (7.51)		15 (5.92)	51 (20.16)	19 (7.51)	
Residential unit																
Detached house(n=154)	25 (9.89)	75 (29.65)	54(21.32)	0.018*	35 (13.84)	48 (18.96)	71 (28.08)	0.011*	25 (9.89)	54 (21.32)	75 (29.65)	<0.001*	21 (8.30)	58 (22.92)	75 (29.64)	<0.001*
Town house(n=99)	48 (18.96)	46 (18.19)	5(1.99)		54 (21.32)	35 (13.84)	10 (3.96)		58 (22.93)	24 (9.50)	17 (6.71)		50 (19.76)	32 (12.65)	17 (6.72)	

*P<.05

Table 4 Results of Correlation Analysis between knowledge, Attitudes, Perceptions, and Self-Hazardous Waste behavior in households

Items	Self-hazardous waste behavior in households			
	r	Sig.	Direction of relationship	Level of relationship
Knowledge	0.356	0.000*	Positive	Moderate
Attitudes	0.507	0.000*	Positive	Moderate
Perceptions	0.375	0.000*	Positive	Moderate

*P<.05.