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Factors Contributing to Food Waste Awareness among Malaysian Youth

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Abstract
Purpose: This research aims; (1) to measure the level of knowledge and the level of concern about food waste related issue among Malaysian youth; and, (2) to identify the relationships among youth characteristics and the knowledge and level of concern about food waste related issue among youth in Malaysia
Design/methodology/approach: The purposive sampling technique has been used and a total of 1,000 surveys using questionnaires were distributed to the respondents in Pahang. However, there are only 531 respondents that have returned their questionnaire. After excluding the invalid and incomplete feedback from respondents, the final sample of this study is only 482.
Findings: This study has found that 72.73% of youth in Malaysia have sufficiently good awareness, knowledge, and concern about the food waste related issues. This study also found that young people have better knowledge and level of concern about food waste related issues.
Research limitations/implications: There were difficulties in term of collecting the questionnaires and obtaining the actual number of youth population in Malaysia. This study would like to recommend adding more variables such as body mass index (BMI) of the respondent, number of households, and type of food waste. Future researchers are also suggested to make comparison between youth and adult on food waste related issues.
Practical implications: There is a better future for our next generation with the huge reduction of food waste. It will help the environment as well as our economy.
Originality/value: This study will contribute to the current literature of food waste in Malaysia

Keywords: Food Waste, Level of Concern, Level of Knowledge, Youth, Demographic

Introduction

Each individual needs food in order to survive. Unfortunately, every household had their fair share of food waste. According to United States Environmental Protection Agency (EPA), food waste can be defined as any uneaten food or food preparation residues from residences or commercial establishments. According to Jarjusey and Chamhuri (2017), waste occurred as food going through the process to reach the consumer. The emerging of supermarkets and fast food chains are the major cause of food waste (Melikoglu, 2013). With better access of food, people are wasting more food each day. Packaged foods are convenient but people are not aware that they are purchasing more than needed. Thus, foods that are still consumable are thrown away and it makes up toward billions of dollars (Beede, 1995). In United States alone,

at least 35 million tonnes or 77 billion pounds of edible food, worth nearly $30 billion, is thrown away from restaurants, convenience stores, and supermarkets every year (Jones, 2005). In Malaysia, the households' total waste was based on income group and on average, 30.84% by high income group, 38.42% by middle income group, and 54.04% by low income group (Badgie, Samah, Manaf, & Muda, 2011; Jarjusey & Chamhuri, 2017). According to SWCorp (2015) report, during festive seasons, there will be an increase of food waste quantities around 15% to 20%. With no remedial alternative to reduce this problem, the number of total food waste is soaring every year in Malaysia.

Besides, recent studies are providing evidence from developed countries and only few studies are providing the perspective of developing countries (Papargyropoulou et al., 2019). Despite different approaches and results, most of the previous researches are searching for the answer to reduce food waste in order to help future generations. Therefore, this research aims; (1) to measure the level of knowledge and level of concern about food waste related issue among Malaysian youth; and, (2) to identify the relationships among youth characteristics and knowledge and level of concern about food waste related issue among youth in Malaysia.

The paper is structured as follows. The next section contains brief review of the literature on the knowledge and level of concern about food waste related issue and gender, age, living status, marital status and household income as well as the hypothesis development. The data collection process will then be discussed in the Method section by providing details on the sampling design and the questionnaire. The main findings of our analyses can be seen in the Results section and discussed in the following section. Finally, the conclusions of this study, limitations and recommendations for carrying out further research are presented in the last section.

Literature Reviews

Knowledge and Level of Concern about Food Waste Related Issue

According to Martin-Rios, Demen-Meier, Gössling, and Cornuz (2018), awareness has been defined as beliefs, knowledge, goals, and actions. Therefore, researchers in opinion to knowledge about food waste are coinciding with awareness about food waste. Fox et al. (2018) found that respondents from Denmark, Greece, Indonesia, and Taiwan have less knowledge about food waste but agreed that food waste is an environmental and ethical issue that leads to the loss of economic and natural resources. Taiwan was one of countries that have the highest level of knowledge and awareness on consumer-generated food waste. Fox et al. (2018) categorised knowledge on food waste into two categories known as subjective knowledge (environmental, economic, and ethical implications of food waste) and objective knowledge (global and consumer-generated food waste and the Sustainable Development Goals). Fox et al. (2018) found out that respondents from Denmark, Greece, Indonesia, and Taiwan have less knowledge about food waste but agreed that food waste is an environmental and ethical issue that leads to the loss of economic and natural resources. On the other hand, Richter (2017) found that with the highest observed level of knowledge about food waste, consumers increasingly plan more of their meals and food purchases.

Even if the definition and measurement of environmental concern vary in research, studies agree on a certain number of characteristics of environmental and could be applied to the question of food waste at the individual level, interpersonal level, and global level (Borgne, Siriex, & Costa, 2016). Concerns on food waste attached with food waste consequences affected the experience of food waste and integrated into an antecedents-concern-behavior (Borgne et al., 2016). Borgne et al. (2016) found out that there were significant relationship between meal lists, shopping lists, checking fridge, and cupboard before shopping, consuming leftovers as soon as possible with the level of individual concern. Borgne et al. (2016) also

found that there was significant relationship between consuming leftovers as soon as possible with the level of global concern. Principato, Secondi, and Pratesi (2015) found that the more aware youths are concerning food waste, the more likely they are to reduce leftovers. According to Principato et al. (2015), concern about food waste is a significant indicator that leads towards food waste reduction. Hence, it encourages the intention and behaviour to reduce food waste.

Gender, Age, Living Status, Marital Status and Household Income

In general, there is no general agreement among researchers regarding the impact of gender on food waste. Based on the past studies, women are less likely to waste food products in comparison to men (Secondi, Principato, & Laureti, 2015; Visschers et al., 2016). However, this findings was not generalised because Principato, Secondi, and Pratesi (2015) found that young females produced the same amount of food waste as young male and single women produced more food waste in comparison to single men or couples (Silvennoinen et al., 2014; Koivupuro et al., 2012). This signals the fact that it is very likely that the behaviour of women changes once they grow older and begin forming couples that lead their responsibilities in the household to change. In fact, studies have consistently shown that households where children are present waste more food than households without children (Secondi et al., 2015). Therefore, being a good parent and partner appears to be an important reason for food waste (Porpino et al., 2016; Visschers et al., 2016). It was influenced by desire to provide an abundance of food as well as the wish to serve proper food to express affection and love to their family (Graham-Rowe et al., 2014; Porpino et al., 2016). Good provider identity like being a good host to serve enough and the right food goes beyond own household and encompasses guest triggers providing an abundance of food (Graham-Rowe et al., 2014). Thus, buying healthy food does not necessarily result in its consumption (Evans, 2011) but to an abundance of perishable foods that are at risk of wastage. In addition, the increase in the household income made food easily available in more quantities (Jarjusey & Chamhuri, 2017). Studies have shown that individual tend to often express feelings of guilt when they waste food because they take this as a sign that they are not properly managing the household and that they are failing to provide sustenance to their family members (Lyndhurst, 2007). Therefore, gender, age, living status, marital status, and household income contributed to knowledge and level of concern about food waste related issue.

Conceptual Framework and Hypothesis Development

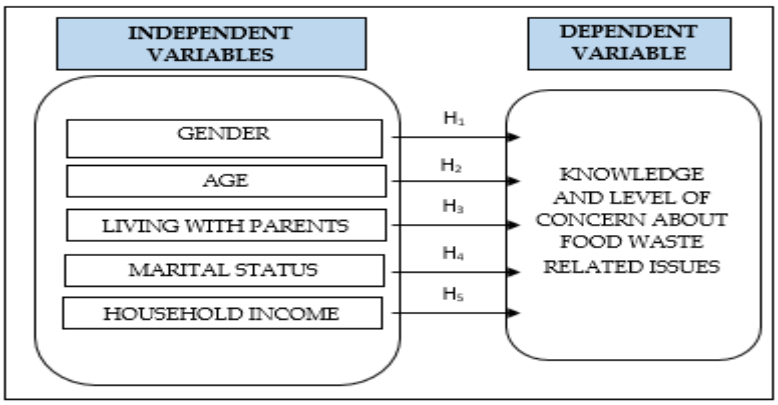

Figure 1: Schematic Diagram

Gender towards Knowledge and Level of Concern about Food Waste Related Issue
Porpino (2016) found that gender affects the behaviour related to waste separation in the household. According to past studies, men and women have a different behaviour towards food waste (Secondi, Principato, & Laureti, 2015; Visschers et al., 2016). Graham-Rowe, Jessop, and Sparks (2015) found that men are less likely to express interest in reducing the amount of foods wasted and Qi and Roe's (2016) study reported that women are more likely to feel guilty when having to throw away food items. Thus, this hypothesis has been proposed:

Hypothesis 1 (H_1): *There is a significant relationship between gender and knowledge and level of concern about food waste related issue*

Age towards Knowledge and Level of Concern about Food Waste Related Issue
Principato, Secondi, and Pratesi (2015) found that young females produced the same amount of food waste as young males and the food waste pattern changes once they grow older (Cantaragiu, 2019). Thus, this hypothesis has been proposed:

Hypothesis 2 (H_2): *There is a significant relationship between age and knowledge and level of concern about food waste related issue*

Living Status towards Knowledge and Level of Concern about Food Waste Related Issue
According to Secondi et al. (2015), households with the present of children produced more food waste than households without children. This is consistent with Cantaragiu (2019) study which mentioned that certain acquisition and consumption patterns by household members might lead to food waste. Thus, this hypothesis has been proposed:
Hypothesis 3 (H_3): *There is a significant relationship between living status and knowledge and level of concern about food waste related issue*

Marital Status towards Knowledge and Level of Concern about Food Waste Related Issue
According to Silvennoinen et al. (2014) and Koivupuro et al. (2012), single women produced more food waste in comparison to single men or couples. The behaviour of individual changes once they are married due to their responsibilities in the household has changed (Cantaragiu, 2019). In most households where individuals of both genders reside, women are usually the ones responsible for grocery shopping (McCarthy & Liu, 2017) and preparing the meals (Koivupuro et al., 2012). Studies have reported that women often to feel guilty for food waste because it is a sign of not properly managing the family and failing to provide sustenance to their family members (Lyndhurst, 2007). Thus, this hypothesis has been proposed:

Hypothesis 4 (H_4): *There is a significant relationship between marital status and knowledge and level of concern about food waste related issue*

Household Income towards Knowledge and Level of Concern about Food Waste Related Issue
According to Porpino et al. (2015), having enough food at home is considered a sign of hospitality and wealth among low-income families in Brazil. Thus, full-time employment could have a negative effect on the amount of food wasted. Ganglbauer et al. (2013) and Stancu et al. (2016) found a positive correlation between income and food waste. Consistently, Principato et al. (2015) and Qi and Roe (2016) reported that households with different income levels differ in particular with regards to their attitudes towards food waste reduction. Thus, this hypothesis has been proposed:

Hypothesis 5 (H_5): *There is a significant relationship between household income and knowledge and level of concern about food waste related issue*

Method

As at 2019, the total number of population recorded by the Department of Statistics Malaysia (DOSM) that ranged from the age of 15 years old to 44 years old in Pahang are 842.4 thousand. "Youth" has been defined by The Youth Societies and Youth Development Act, 2007 as ***"a person not less than 15 years old and not more than 40 years old"***. Hence, purposive sampling technique has been used and a total of 1,000 surveys using questionnaires were distributed to the respondents in Pahang. However, there are only 531 respondents that have returned their questionnaires. After excluding the invalid and incomplete feedback from respondents, the final sample of this study is only 482. This amount is sufficient to get a result that reflects the population as precisely as needed (Sekaran & Bougie, 2016). Besides that, the youth in the state of Pahang was selected as this state is the largest state in peninsular Malaysia.

This study used primary data and the information has been obtained through the distribution of questionnaire to the target respondents. The questionnaire consists of 2 sections, which are section A and section B. The dependent variable in this study is included in Section A and independent variables are included in the section B. In the section B, it consists of the demographic profile of respondents. The dependent variable in this study is the knowledge and level of concern about food waste related issues. It was adopted from Principato et al. (2015). The variable was measured based on 5-point Likert scale. This scale is used to measure the level of agreement or disagreement towards the statement given with five different scale rates that range from (1) = Strongly Disagree to (5) = Strongly Agree. While the independents variables for this study are the demographics factors of the respondents namely; Gender, Age, Living status, Marital status, and the Level of household income.

Before proceeding to test the hypotheses in this study, a Cronbach's alpha test was performed to ensure that the questionnaire developed in this study is reliable. Afterwards, the normality test was conducted to test the normality of data before proceeding to the correlation and the regression analysis. Then, a correlation analysis was conducted to measures the strength of association between two variables and the direction of the relationship between the dependent variable and the independents variables.

Findings

Table 1 to Table 5 below show the frequency analyses for all the independent variables. Most of the respondents are female (62%) and mainly between 21-23 years old with the percentage of 58.7%. As they are categorise as youth, it resulted 97.5% out of 482 respondents are single and 72.2% of the respondents stay with their parents.

Table 1: Frequency Analysis - Gender

	Frequency	%
Male	183	38.0
Female	299	62.0
Total	482	100.0

Table 2: Frequency Analysis - Age

	Frequency	%
15-17 Years	2	0.4
18-20 Years	168	34.9
21-23 Years	283	58.7
24-26 Years	18	3.7
27-40 Years	11	2.3
Total	482	100.0

Table 3: Frequency Analysis – Living Status

	Frequency	%
Living with parents	348	72.2
Not living with parents	134	27.8
Total	482	100.0

Table 4: Frequency Analysis – Marital Status

	Frequency	%
Single	470	97.5
Married	12	2.5
Total	482	100.0

Table 5: Frequency Analysis – Household Income

	Frequency	%
<RM15,000	387	80.3
Between RM15,000 and RM30,000	53	11.0
Between RM30,001 and RM45,000	15	3.1
Between RM45,001 and RM60,000	17	3.5
More than RM60,000	10	2.1
Total	482	100.0

Based on the result shown in Table 6, knowledge and level of concern about food waste related issues (FOOD WASTE) scored the mean value of 3.6363 which is equivalent to 72.73%. This analysis answers the first objective of this study which is to measure the knowledge and level of concern about food waste related issues among Malaysian youth. This figure shows that youth in Malaysia have sufficient good awareness, knowledge and concern about food waste related issues. It is a good sign to have a good-future-generation in reducing food waste in the future specifically in Malaysia and indirectly can support the sustainable development goals.

Table 6: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Dependent Variable :				
Knowledge and level of concern about food waste related issues	1.71	5.00	3.6363	.45723

Table 7 below shows the result of the Cronbach's alpha reliability coefficient for the dependent variable, knowledge and level of concern about food waste related issues which the score is 0.792. According to Hair, Black, Babin, and Anderson (2010), the reliability of 0.7 or higher

indicates that the questionnaire has acceptable internal consistency between the items in the scale.

Table 7: Reliability Test

Cronbach's Alpha	N of Items
.792	21

The normality test was performed and the results showed as per presented in Table 8 below. The knowledge and level of concern about food waste related issues scored the skewness of 0.288 and 1.367 for kurtosis. Both values are fall under normal range as per suggested by Rahman and Ali (2006) where they suggested that the normal data will have a standard skewness within +/- 1.96 and standard kurtosis of +/- 2. Hence, the following analyses have been done by using original data.

Table 8: Normality Test

Variable	Skewness	Kurtosis
Knowledge and level of concern about food waste related issues	0.288	1.367

Next, the Pearson correlation analysis was conducted to test the relationship between GENDER, AGE, LIVING, STATUS, INCOME, and FOOD WASTE among Malaysian youth in Pahang. From the result in table 9, it is shown that the p-value of AGE is less than 0.05, which is 0.014. It shows that there is a significant negative relationship between AGE and FOOD WASTE. From the relationship, we can conclude that, the younger a person, the greater the knowledge and level of concern about food waste related issues. The youth anticipated having greater awareness as most of the respondents living away from their guardians and they need to be responsible on their own daily lifestyle including their daily food intake. It is consistent with Hanssen, Syversen, and Stø (2016) finding. According to Hanssen et al. (2016), the most waste was generated in households in age category 70–84 years (1.75 kg per person). We can conclude that the youth have greater awareness about food waste. Hence, hypothesis 2 (H_2) is accepted.

As for INCOME, the p-value also less than 0.05, precisely at 0.023 which shows negative relationship between these two variables. It is consistent with the study done by Stancu, Haugaard, and Lähteenmäki (2016) who stated that the lower the income, the higher the knowledge and level of concern about food waste related issues. Stancu et al. (2016) found that youth with lower income have a greater awareness of food waste consequences and awareness of economic impact compared to those who earned huge income every year. This might be because they are planning and preparing well for their daily and monthly expenditure. Hence, hypothesis 5 (H_5) is accepted.

Meanwhile, for the other independent variables, GENDER, LIVING, and STATUS, the p-values are more than 0.05. It shows that all these three variables have no significant impact towards the FOOD WASTE. Hence, the hypothesis 1 (H_1), Hypothesis 3 (H_3), and Hypothesis 4 (H_4) are not supported in this study.

Table 9: Correlation Analysis

		GENDER	AGE	LIVING	STATUS	INCOME	FOOD WASTE
GENDER	Correlation	1	-.067	-.039	.043	-.088	-.075
	Sig.		.143	.389	.350	.053	.099
AGE	Correlation		1	.105*	.253**	.121**	-.112*
	Sig.			.021	.000	.008	.014
LIVING	Correlation			1	.109*	-.093*	.074
	Sig.				.017	.042	.105
STATUS	Correlation				1	.026	.073
	Sig.					.575	.109
INCOME	Correlation					1	-.103*
	Sig.						.023
FOOD	Correlation						1
WASTE	Sig.						

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Where;

FOOD WASTE	Knowledge and level of concern about food waste related issues
GENDER	Gender of the respondents
AGE	Age of the respondents
LIVING	Living with parents
STATUS	Marital status of the respondents
INCOME	Level of household income

Discussion and Conclusion

The first objective of the study is to measure the level of knowledge and level of concern about food waste related issue among Malaysian youth. This study found that 72.73% of youth in Malaysia have sufficient good awareness, knowledge and concern about food waste related issues. Thus, this indicates that future-generation will have the tendency to reduce food waste in the future to support Malaysia sustainable development goals.

The second objective of the study is to identify the relationships among youth characteristics and knowledge and level of concern about food waste related issue among youth in Malaysia. From the result we can conclude that, young people have better knowledge and level of concern about food waste related issues. Due to their tight budget, young people are more responsible on their daily food consumption.

This study found that there is a significant negative relationship between AGE and FOOD WASTE among youth in Malaysia. This result shows that youth in Malaysia have sufficient good awareness, knowledge, and concern about food waste related issues. The results of this study are consistent with previous studies that have been done by Hanssen, Syversen, and Stø (2016), who found that youth are anticipated to have greater awareness especially on their food intake. Principato, Secondi, and Pratesi (2015) and Cantaragiu (2019) also found that youth produced the same amount of food waste and the pattern only changes once they grow older.

Moreover, this study found the negative relationship between INCOME and FOOD WASTE. This is supported with the study done by Stancu, Haugaard, and Lähteenmäki (2016) which reported that the lower the income, the higher the knowledge and level of concern about food waste related issues. Stancu et al. (2016) found that youth with lower income have a greater awareness of food waste consequences and awareness of economic impact compared to those who earned huge income every year.

In conclusion, youth are aware and concern about food waste related issue. With further awareness on food waste, we are able to tackle this problem and reduce more food waste in the future. This would not only help the environment and our economy, but also improve our ethical and moral values.

Although this study has reached its objectives, there are limitations as well. There were difficulties in term of collecting the questionnaires and obtaining the actual number of youth population in Malaysia. However, the limitation mentioned above will not invalidate the findings of the study.

This study would like to recommend adding more variables such as body mass index (BMI) of the respondent, number of households, and type of food waste for future research. Future researches are also suggested to make comparison between youth and adult on food waste related issues.

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