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Exploring the Impact of Women's Knowledge and Attitude Towards Food Waste Management Practices in Melaka Tengah, Melaka

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Abstract: Food waste is a significant global issue, and Malaysia is no exception. It has far-reaching negative effects, including higher food production costs, adverse impacts on human health, and environmental degradation. Therefore, this study assesses women's knowledge and attitude towards food waste management in Melaka Tengah, Melaka. An online self-administered questionnaire with a Likert scale was distributed among 384 respondents as part of the study's quantitative methods. The Statistical Package for the Social Sciences (SPSS) Version 26 was used for data analysis. The data analysis methods included reliability, descriptive, and Pearson correlation analyses. The results indicated a positive correlation between knowledge and attitudes toward food waste management practices among women in Melaka Tengah, Melaka. Effective food waste management is essential for building sustainable systems and addressing the interconnected social, economic, and environmental challenges posed by waste.

Keywords: *Food Waste Management, Knowledge, Attitude, Practices, Women.*

1. Introduction

Food waste involves food for human consumption that has been wasted or not eaten. Food waste includes a portion of food that is unfit for human consumption and removed from the supply chain to be discarded or recovered. In this regard, food waste, including ploughed and harvested crops and organic wastes that can produce bioenergy and biogas, could be discarded through composting, open burning, or disposal in sewers, landfills, or disposed of in the ocean (Nordin et al., 2020). Typically, women are responsible for household chores, such as food waste management, due to power relationships in households. This suggests that they can play an important role as household managers, and play a crucial role in reducing food waste (Ahmadi, 2018). Besides, food waste is more prevalent in women than in men (Zahara et al., 2021).

Issues related to food waste have been increasing annually. There has been much attention on avoiding or reducing food loss and food waste and recent research has shown that young adults 18 to 24 years old have a higher tendency to waste compared to other age groups (Henry, 2018). Furthermore, women were found to exhibit food acquisition and preparation behaviors that result in higher food waste than men (Ramona Cantaragiu, 2019). According to Hadiningrat (2020), women are responsible for 85-90% of food preparation and cooking, which may make them more likely to reduce food waste. In 2020, approximately 35% of the waste generated in Melaka City was organic food waste, making it the most common form of waste in the area. Effective food waste management can lead to cost savings for households and businesses by reducing the amount of waste that needs to be processed and disposed of (Resilient Cities Network, 2022). This study can contribute to more sustainable waste management practices in Melaka Tengah.

Hence, this research aims to explore the knowledge and attitudes of women in Melaka Tengah, Melaka towards food waste management practices. Achieving effective waste management practices requires a combination of adequate knowledge and appropriate approaches. This study will clarify how women manage food waste and handle excess food.

Therefore, the main objectives of this research are shown below:
RO1: To determine the relationship between knowledge among women in Melaka Tengah, Melaka, and food waste management practices.
RO2: To determine the relationship between attitudes among women in Melaka Tengah, Melaka, and food

waste management practices.

2. Literature Review

Knowledge About Food Waste Management: Knowledge is a consequence of getting and improving learning; in this regard, information is important as it guides people to complete tasks, settle on a choice, or tackle an issue. Thus, in the context of campaign planning and information dissemination, the use of enticing messages is fundamental to reaching a decisively significant crowd (Abd Razak, 2017). Nevertheless, according to Aschemann-Witzel et al. (2015), people have at least some understanding of how to manage food in their families, yet they regularly do not act according to their insight. A previous study by Srivastava (2020) found that women's lack of knowledge can have an adverse influence on waste management. Women's knowledge of food waste management is crucial, as they often play a central role in household food practices. Studies indicate that women are more concerned about the negative impacts of food waste on social equity and family budgets compared to men (Ramona Cantaragiu, 2019). Research focusing on housewives in Indonesia highlights that their knowledge, attitudes, and practices significantly influence food waste management within households. The study found that housewives' understanding of food waste and their proactive approaches are essential in reducing waste (Zahara et al., 2021).

Attitudes Towards Food Waste Management: Attitudes are frequently formed as a result of personal experience or upbringing, and they can have a significant impact on behavior. While opinions can last a lifetime, they can also shift (Susman, 2021). However, the study adds to earlier findings by revealing that women are more prone than males to see food waste as an indication of social inequity and to be concerned about the plight of children from low-income households who are hungry (Ramona Cantaragiu, 2019). According to Ramona Cantaragiu (2019), women's attitudes toward food waste management are influenced by various factors, including cultural norms, economic considerations, and environmental concerns. In certain regions, women are more likely to purchase local and organic food products, reflecting a higher concern for nutritional and sustainability aspects related to food. This tendency can positively impact the amount of food wasted, as individuals who buy local produce tend to waste less.

Food Waste Management Practice: Practices can be defined as an action to do something repeatedly to improve at it, as well as an action to do something regularly as part of one's daily routine. Ineffective and effective waste management has diverse effects on human and environmental health, with ineffective management causing harm while effective management promotes both human and environmental health (Adogu et al., 2015). People engage in practice in tandem with their increasing knowledge and attitudes. As a result, by improving knowledge and attitudes about food waste management, the practice of waste management can be improved. People may be more likely to embrace good waste management practices if they are aware of the negative consequences of inadequate trash disposal (Bashir et al., 2020).

Women: According to Ramona Cantaragiu (2019), women waste less food than men. However, other studies have yielded contradictory findings, particularly regarding the behavior of single women, who are reported to produce more food waste compared to single men or couples (Silvennoinen et al., 2014). This indicates that women 's behavior will most likely change as they get older and begin to form relationships as their responsibilities in the home change. Women are typically responsible for grocery shopping and meal preparation in most households with people of both genders (McCarthy & Liu, 2017). According to Ramona Cantaragiu (2019), women are more likely to buy local food and organic food products because they are more concerned about the nutritional and sustainability aspects of food. This may reduce the amount of food wasted by women because previous research has shown that people who buy local produce waste fewer vegetables and fruits or fewer food products overall (Setti et al., 2016). As household managers, women play a crucial role in reducing food waste. (Hadiningrat, 2020). In Melaka Tengah, women's employment patterns significantly influence their engagement in food waste management. Nationally, women are predominantly employed in the manufacturing sector, which employs approximately 61% of women workers, notably higher than the global average for upper-middle-income countries (United Cities and Local Governments, 2022). This sector's demanding work schedules and long hours can limit women's time and energy for household tasks, including food waste management. Consequently, women with such employment may have less opportunity to engage in sustainable food practices, such as composting or waste segregation. Conversely, women in sectors with more

flexible hours, such as retail or education, might have greater capacity to implement effective food waste management strategies at home. For instance, a study on household food waste management in Bangladesh found that women in owner-occupied homes demonstrated more comprehensive food waste management practices compared to those in rented houses (Tahera et al., 2024).

3. Methodology

In this study, quantitative methods and descriptive analysis were applied to determine how women in Melaka Tengah, Melaka, manage their food waste. This study also examined the relationship between knowledge and attitudes among women in Melaka Tengah, Melaka, towards food waste management practices.

The sample size was further determined for women in Melaka Tengah, Melaka, based on their current population. As the population of women in Melaka Tengah is estimated at 285,300 (Department of Statistics Malaysia, 2020), the estimated sample size is 384 respondents based on Krejcie and Morgan (1970). Women in Melaka Tengah were chosen as a sample to answer this questionnaire because food waste from households is the largest contributor to food waste (Jereme et al., 2016). Data was collected from each individual for this purpose. Hence, the unit of analysis is the individual woman. This study employed a non-probability purposive sampling. Non-probability purposive sampling is a common method used when researchers deliberately select participants based on specific characteristics, criteria, or expertise relevant to the research. In addition, this sampling technique can save time and resources by focusing only on participants likely to provide valuable insights.

In this study, the design of the questionnaire survey was based on a nominal scale. The closed-ended questions were included in the questionnaire and a Likert scale column was used. The questionnaire employed a five-point Likert scale that indicates strongly disagree (1), disagree (2), undecided (3), agree (4), and strongly agree (5) (Bashir et al., 2020). The questions were kept simple and clear, considering the respondent's profile.

Primary and secondary data were collected as part of this study. Primary data were collected using a questionnaire distributed online using Google Forms. The respondents were required to complete all four sections of the questionnaire. Then, the Statistical Package for the Social Sciences (SPSS) was used to analyze the data. The data from the respondents' demographics were evaluated using descriptive statistics. A Pearson correlation will be used to study the relationship.

The hypotheses of this research are shown below:
H1: There is a significant positive relationship between women's knowledge and food waste management practices.
H2: There is a significant positive relationship between women's attitudes and food waste management practices.

4. Findings and Results

Reliability Analysis

According to Heale and Twycross (2015), reliability means the consistency of measurements. In this study, Cronbach's alpha was used to determine the instrument's internal consistency, and the acceptable reliability score is 0.7 and higher. A pilot test involving 30 women in Melaka Tengah was conducted before the actual data collection. According to the data collected, the knowledge variable has a score of 0.707, while the attitude variable has a score of 0.844. For practice, the score is 0.734.

Table 1: Results of Reliability Analysis

Variables	Cronbach's Alpha	No. Of Items	No. Of Respondents
Knowledge	0.707	8	30
Attitude	0.844	9	30
Practices	0.734	10	30

Demographic Profile

This section describes the screening question used to determine the respondent's descendant. In addition, this section provides information about the respondents' backgrounds, such as age, education level, employment status, subdivision/ township, and marital status.

Table 2: Frequency Results of Screening Question

	Frequency	Percentage (%)
Screening Question	27	
Women	329	85.7
Non-Women	55	14.3

The screening question is necessary to meet the requirements of data distribution as it was distributed online. Only 329 of the 384 respondents can be used as data, with the remaining 55 considered invalid because they are not women.

Table 3: Respondents' Profile

	Category	Frequency	Percentage (%)
Age	18 – 20 years	13	4.0
	21 – 25 years	142	43.2
	26 – 30 years	49	14.9
	31 – 35 years	26	7.9
	36 – 40 years	32	9.7
	41 – 45 years	13	4.0
	46 – 50 years	12	3.6
	50 – 60 years	42	12.8
Education level	Sijil Pelajaran Malaysia (SPM)	44	13.4
	Diploma	81	24.6
	Degree	179	54.4
	Master	16	4.9
	Other	9	2.7
Employment status	Employed	178	54.1
	Unemployed	151	45.9
Subdivision/ township	Bukit Baru	10	3.0
	Bandar Melaka	133	40.4
	Ayer Molek	23	7.0
	Batu Berendam	23	7.0
	Bukit Rambai	36	10.9
	Kandang	7	2.1
	Klebang	38	11.6
	Paya Rumput	19	5.8
	Sungai Udang	25	7.6
	Tangga Batu	11	3.3

	Tanjung Kling	4	1.2
Marital status	Single	161	48.9
	Married	141	42.9
	Widow	27	8.2
	Total	**329**	**100**

Table 3 describes the respondent's profile based on their age, education level, employment status, subdivision/ township, and marital status. The majority of women who participated in this research were at the ages of 21-25, with 43.2% (142 respondents). This occurs because, at this age, they are gadget-savvy and used to fill up online questionnaires compared to others. This is followed by 26-30 years old with 14.9% (49%), 50-60 years old with 12.8% (42 respondents), 36 - 40 years old with 9.7% (32 respondents), 31-35 years old with 7.9% (26 respondents), 18 - 20 years old and 41 - 45 years old shared the same percentage with 4.0% (13 respondents) and lastly 46 - 50 years old with 3.6% (12 respondents).

For education level, the majority of respondents were degree holders at 54.4% (179 respondents), followed by diploma holders at 24.6% (81 respondents), Sijil Pembelajaran Malaysia (SPM) at 13.4% (44 respondents), master with 4.9% (16 respondents) and lastly other with 2.7% (9 respondents). Next, for their employment status, most of the respondents were employed with 54.1% (178 respondents) and unemployed with 45.9% (151 respondents). Furthermore, in terms of their location, the highest number of respondents was from Bandar Melaka with 40.4% (133 respondents), Klebang with 11.6% (38 respondents), Bukit Rambai with 10.9% (36 respondents), Sungai Udang with 7.6% (25 respondents), Ayer Molek and Batu Berendam shared the same percentage with 7.0% (23 respondents), Paya Rumput with 5.8% (19 respondents), Tangga Batu with 3.3% (11 respondents), Bukit Baru with 3.0% (10 respondents), Kandang with 2.1% (7 respondents) and Tanjung Kling with 1.2% (4 respondents). Lastly, for marital status, singles scored the highest percentage with 48.9% (161 respondents), married with 42.9% (141 respondents), and divorced/widowed with 8.2% (27 respondents).

Descriptive Analysis

Table 4: Results of Descriptive Analysis

					Scale				
No.	**Questions**	**Mean**	**Min**	**Max**	**1**	**2**	**3**	**4**	**5**
Knowledge									
1.	Freshness labels are something I'm familiar with.	4.0365	1	5	39	23	1	42	224
2.	More food waste in the home means more money wasted.	4.2462	2	5	0	66	7	27	229
3.	It is essential to specify the expiry date on food products to avoid food poisoning and illness.	4.7599	4	5	0	0	0	78	251
4.	I will have a positive attitude about food waste if our community implements a food waste recycling scheme.	4.4286	2	5	0	23	11	94	201
5.	I make an effort to reduce food waste.	4.0395	1	5	24	27	0	139	139
6.	I'd like to do something to prevent food waste.	3.5410	1	5	27	84	3	110	105
7.	Before going shopping, I check the refrigerator.	3.6717	1	5	15	80	3	123	108
8.	Food waste recycling can provide a source of income.	3.7599	2	5	0	90	7	119	113
Attitude									
1.	I feel bad about wasting food.	3.9119	1	5	10	57	4	139	119
2.	My efforts to reduce food waste are ineffective.	3.3009	1	5	7	119	2	109	92
3.	I'm not bothered by food waste.	2.6170	1	5	154	36	12	4	123
4.	After each meal, I immediately throw any leftovers into the garbage can.	3.2888	1	5	57	53	42	69	108

5.	I recycle food waste when it is convenient for me to do so.	3.0881	1	5	9	154	4	85	77
6.	Weekly meal planning, in my opinion, is cost-effective for a household budget.	3.5836	1	5	45	45	34	72	133
7.	When shopping for food, I believe a grocery list is essential.	3.6626	1	5	65	1	67	33	163
8.	I feel that purchasing only the items on the list will help me save money and food waste.	3.4924	1	5	88	7	9	40	185
9.	I don't believe the food I throw away is expensive.	3.0669	1	5	116	28	25	8	152
Practices									
1.	I discard food that is blemished, wilted, moldy, dried, or otherwise shows signs of spoilage.	4.2340	2	5	0	21	45	81	182
2.	Even if it has not been opened, I discard packaged food that has passed its 'best before' date.	3.7933	1	5	28	26	58	84	133
3.	When I go shopping, I make minor purchases regularly.	3.2401	1	5	48	65	47	75	94
4.	I eat meals bought from restaurants, fast food or food trucks.	3.3860	1	5	13	111	4	105	96
5.	I keep leftovers in the refrigerator and consume them afterward.	3.2766	1	5	50	67	38	76	98
6.	Some members of the home do not always consume all of their food.	3.6839	2	5	0	82	5	125	117
7.	We are generally too busy to cook the meals that we planned.	3.3252	1	5	45	57	54	73	100
8.	I followed the storage directions.	3.3647	2	5	0	131	3	84	111
9.	For food and leftovers, I have storage containers.	3.7356	1	5	28	45	39	64	153
10.	I am educated about the best methods for storing various foods.	3.2644	1	5	45	68	52	76	88

Table 5: Summary of Descriptive Analysis

	Mean	Std. Deviation	N
IV1 (Expiry date)	4.7599	0.42781	329
IV2 (Feel bad about wasting food)	3.9119	1.15617	329
DV (Discard spoiled food)	4.2340	0.94833	329

The descriptive analysis determined the mean scores for 3 variables, knowledge, attitude, and practices. A 5-point Likert scale ranging from strongly disagree (1), disagree (2), undecided (3), agree (4), and strongly agree (5) was also used. In this study, data frequencies were used to answer the research questions. Table 4 summarizes the results of the descriptive statistics for all the variables. The most frequent variable viewed by the respondents is expiry date, with the highest mean (4.7599), followed by feeling bad about wasting food (3.9119). This shows that the respondents frequently look at the expiry date on the food label before buying food products. This is in line with Ahmmed and Mohammed (2014), who highlighted the importance of checking the expiry date to ensure the quality as well as the safety of the food products before buying. Furthermore, it indicates that the women have more knowledge of the expiry date compared to other variables. Moreover, feeling bad about wasting food was the second highest variable for their attitude. According to Ramona Cantaragiu (2019), studies have shown that women 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 for their family members.

Pearson Correlation Analysis

Table 6: Rule for Pearson Correlation Analysis

Strength of Relationship	Coefficient, R	
	Positive	Negative
None	0.0 to 0.1	0.0 to -0.1
Weak	0.1 to 0.3	-0.1 to 0.3
Moderate	0.3 to 0.5	-0.3 to -0.5
Strong	0.5 to 1.0	-0.5 to -1.0

Source: Cohen (2013)

Table 6 presents the Pearson Correlation rule, which was used to interpret a correlation coefficient, r. The Pearson Correlation was used to determine the relationship between independent and dependent variables. Correlation coefficients can range from +1 to -1. If the value is 0, that means there is no relationship between the two variables. A value greater than 0 indicates a positive relationship; that is, as the value of one variable increases, the value of the other variable increases as well.

Table 7: Correlations Between Knowledge and Practices

		Knowledge	Practices
Knowledge	Pearson Correlation	1	.265**
	Sig. (2-tailed)		.000
	N	329	329
Practices	Pearson Correlation	.265**	1
	Sig. (2-tailed)	.000	
	N	329	329

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

Table 7 shows the correlation result between the knowledge of women in Melaka Tengah, Melaka, towards food waste management practices. The positive correlation (r = 0.265) and p-value between knowledge and practices suggest that as knowledge increases, practices tend to improve, although the effect is not strong. This may be because most women in the study were employed and did not have time to practice reducing food waste. According to Andrzejewska (2021), individuals who are unemployed or work part-time tend to waste less food than those working full-time. Besides that, Abdul Jalil et al. (2022) revealed a weak positive correlation between knowledge and practice, suggesting that higher knowledge levels did not strongly predict better food waste management practices. In contrast, Abd Razak (2017) found that a common factor influencing consumer practices regarding food waste is a lack of knowledge.

Table 8: Correlations Between Attitude and Practices

		Practices	Attitude
Practices	Pearson Correlation	1	.259**
	Sig. (2-tailed)		.000
	N	329	329
Attitude	Pearson Correlation	.259**	1
	Sig. (2-tailed)	.000	
	N	329	329

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

Table 8 shows the result of the Pearson Correlation to determine the relationship between attitude and food waste management practices. The R-value of attitude and practices is 0.259, indicating a weak positive linear relationship between attitudes among women in Melaka Tengah, Malacca, towards food waste management practices. This is because most young women are not aware of food waste practices. According to Ramona Cantaragiu (2019), for the participants below 30, the study has shown that women are more likely to adopt behaviors that can lead to higher amounts of food waste, not prioritizing the consumption of food items based on the expiration date and cooking more than the household can consume. Additionally, Abdul Jalil et al. (2022) agreed that there is a positive correlation between attitude and practices on food waste management.

Discussion

Based on the data presented above, the study found that independent and dependent variables have a positive association, which causes both variables to move in the same direction. In this light, the dependent variable will increase along with the independent variables or otherwise. The first objective was to determine the relationship between knowledge among women in Melaka Tengah, Melaka, towards food waste management practices. According to Table 7, knowledge among women in Melaka Tengah, Melaka, towards food waste management practices has a weak positive relationship because the correlation is r=0.265. Hence, an increase in knowledge will increase the perception of women in Melaka Tengah. It means that the practices of food waste management will change because of their knowledge. According to Abd Razak (2017), knowledge has a positive impact on food waste management practices only if involvement is high and vice versa. In addition, Rani et al., (2024) found a significant positive correlation between environmental knowledge and food waste behaviors among hospitality students. The findings suggest that there was a positive significant correlation between increased environmental knowledge and better food waste management and sustainability-related behaviors.

The second objective was to determine the relationship between attitudes among women in Melaka Tengah, Melaka, towards food waste management practices. According to Table 8, the result showed that attitudes among women in Melaka Tengah, Melaka, towards food waste management practices have a weak positive linear relationship because the correlation is r=0.259. If the attitude increases, the perception of women in Melaka Tengah will increase. It means that the practices of food waste management will change because of their attitudes. According to Abd Razak (2017), it shows that people who reduce food waste are more involved in the food waste issue. This finding was supported by the study of Abdul Jalil et al. (2022), which reported a positive significant correlation between attitude and practice regarding food waste management among health sciences students.

Bashir et al. (2020) revealed that knowledge and attitude have a positive relationship toward proper waste management practices among night market food operators. It emphasizes the importance of understanding this relationship to promote effective food waste management. These studies collectively suggest that enhancing knowledge about environmental and waste management issues can positively influence attitudes and practices related to food waste management in Malaysia. Therefore, based on the results, it can be concluded that the first and second objectives were achieved because the hypothesis was accepted.

5. Conclusion and Recommendations

In conclusion, this study has explored the knowledge and attitudes among women in Melaka Tengah, Melaka, towards food waste management practices. The findings prove that there is a relationship between knowledge and attitude among women in Melaka Tengah, Melaka, towards food waste management practices. This study also adds new information by exploring research opportunities and gaps related to food waste management in Melaka that the previous researchers did not address. It also explored the extent of women's knowledge and the new attitudes of women in Melaka Tengah towards food waste management practices. Future researchers could explore ways to enhance understanding of food waste management in each state of Malaysia. Such studies would contribute to a broader appreciation of the importance of managing food waste across all states in Malaysia.

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