Association between Demographics and Food Security Awareness in Seremban, Malaysia

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ABSTRACT

The COVID-19 pandemic has highlighted Malaysia's vulnerability in ensuring food security, particularly through supply chain disruptions that caused shortages and price increases. Understanding how communities perceive and prepare for food security has become increasingly important in this context. This study examines the level of food security awareness within the Seremban community in Negeri Sembilan, Malaysia, and explores the association between demographic characteristics and awareness levels. 384 respondents were asked to self-assess their awareness, providing insight into their perceived understanding of food security issues. The findings indicate that 37.50% of participants reported a moderate level of awareness, 34.11% reported a high level, and 28.39% reported a low level of awareness. The Chi-Square Test of Independence revealed that age, gender, education, and household income were not significantly associated with awareness levels. However, the type of housing demonstrated a significant relationship ($p = 0.012$). The study recommends implementing tailored educational initiatives to enhance food security awareness within the community.

Keywords- food security, awareness level, demographic characteristics

INTRODUCTION

Food security is a critical concern that underpins national stability, drives economic development, and directly influences the health and well-being of individuals. In alignment with the United Nations' Sustainable Development Goal 2 (SDG 2), Malaysia has committed to eradicating hunger, enhancing food security, and promoting sustainable agricultural practices [1]. At the global level, the Global Hunger Index (GHI) functions as a key monitoring instrument, offering a comprehensive framework for evaluating and comparing hunger across countries, regions, and the entire world. The index assigns scores between 0 and 100, with lower values indicating minimal hunger and higher values reflecting extreme levels of food insecurity.

Table I Ghi of Malaysia 2000 - 2024

Year	GHI
2000	15.4
2008	13.7
2016	13.4
2024	12.7

In 2024, Malaysia recorded a Global Hunger Index (GHI) score of 12.7, ranking it 61st among 127 countries and placing the nation in the "moderate hunger" category.

While challenges remain, this result indicates significant progress compared to the year 2000, when Malaysia's score was 15.4. The steady decline in GHI scores demonstrates improvements in reducing hunger,

undernourishment, and malnutrition over the past two decades. However, the sustainability of these gains is threatened by multiple ongoing challenges, including the adverse impacts of climate change, economic uncertainties, population growth, and rapid urbanisation. The factors continue to expose vulnerabilities within Malaysia's food security framework, highlighting the need for proactive strategies and comprehensive policies to ensure long-term resilience [2].

Food security has become an increasingly pressing issue in Malaysia, particularly following the COVID-19 pandemic, which revealed significant weaknesses in the national food supply chain. The pandemic not only disrupted production and distribution but also caused shortages and sharp price hikes in essential goods, with rural populations experiencing the heaviest impact [3]. Given that nearly 30% of Malaysia's food supply is dependent on imports, any global market disruption has immediate consequences for domestic availability and accessibility. This reliance underscores the urgent need for a more resilient and self-sustaining food system [4]. Recent policy changes have intensified concerns regarding food affordability. The removal of chicken subsidies has increased public anxiety, highlighting the necessity of evaluating food security at the community level [5].

Demographic factors play a crucial role in shaping how individuals perceive and respond to food security challenges. Factors such as age, education level, household income, gender, housing type, and residential location can influence both knowledge and practices related to food security. Variations among these groups influence how communities access food, their level of awareness regarding food systems, and their adoption of sustainable practices.

Age and education are particularly significant in explaining food security awareness. Older generations, especially those in rural or indigenous communities, often have practical experience in food production and traditional preservation methods [6], whereas younger generations tend to rely more on processed foods and global food systems, with limited direct exposure to farming [7].

Similarly, individuals with higher education levels demonstrate stronger awareness of sustainable practices and nutrition [8], while those with limited education may lack exposure to food security issues, highlighting the need for community-based learning initiatives. Income further deepens this divide, as low-income households face more food insecurity due to affordability and access constraints, while wealthier households benefit from greater food choices and exposure to healthier, sustainable practices.

Other demographic dimensions, such as gender, housing type, and location, also shape food security knowledge. Women, particularly in rural households, are central to food preparation and budgeting but may lack broader policy-level awareness, while men often have greater access to information on global food issues. Housing conditions and available space strongly affect opportunities for home food production, with residents of landed properties and kampung areas engaging more in gardening or small-scale farming compared to high-rise dwellers who rely heavily on markets. Urban residents typically access more information but remain detached from food production, whereas rural communities retain strong traditional farming knowledge. Overall, the demographic variations highlight the importance of tailored policies and educational programmes to address gaps in awareness and strengthen community resilience in achieving long-term food security.

Understanding how households and communities perceive and respond to such challenges is vital, as it provides insights into their preparation for potential risks such as rising prices and future supply chain interruptions. Moreover, fostering awareness and encouraging active participation in sustainable practices such as urban farming and home-based food production can reduce dependency on imports, enhance local resilience, and support long-term national food security. Hence, the study seeks to assess the level of food security awareness within the community of Seremban and to examine how demographic factors such as age, education, income, and housing type influence the awareness levels.

METHODOLOGY

Source of Data

This study was carried out in Seremban, the capital of Negeri Sembilan, Malaysia. As a rapidly growing urban

centre with diverse socioeconomic backgrounds, Seremban provides a relevant context for examining community knowledge and awareness of food security. Primary data were collected through a structured, self-administered questionnaire distributed online using Google Forms.

A convenience sampling approach was employed, chosen for its practicality and cost-effectiveness in exploratory research. Although this non-probability method limits the generalisability of findings to the wider population, it is valuable for providing initial insights and identifying patterns that can inform more extensive studies. A total of 384 respondents participated, representing various age groups, genders, education levels, and household income categories.

The questionnaire consisted of two sections: Section A gathered demographic information, while Section B measured knowledge and awareness of food security. To ensure clarity and reliability, the instrument was pilot-tested with 30 participants prior to full distribution. Table 2 shows the variable of interest in this study.

Table 2 List of Variables

Variable	Description	Measurement
AWARENESS	Food security awareness level	Ordinal
AGE GROUP	Age group of respondents in years	Ordinal
GENDER	Gender of respondents	Nominal
EDU_ LEVEL	Education level of respondents	Ordinal
INCOME	Household income group	Ordinal
HOUSE TYPE	House type of respondents	Nominal

Descriptive Analysis

Descriptive analysis using frequency tables and bar charts was employed to summarise the respondents' demographic profiles and their level of awareness regarding food security. This method provides a clear overview of the data by highlighting general trends and patterns. This approach enables the identification of gaps in awareness and understanding among various segments of the population.

Chi-Square Test of Independence

The Pearson Chi-Square Test of Independence is a statistical method used to examine whether there is an association between two categorical variables. It is commonly applied in social science research, including studies that explore links between demographic characteristics and behaviours [9]. This test compares the observed frequencies in each category of a contingency table to the expected frequencies under the assumption of independence [10]. In this study, the method was used to test the association between age group, gender, education level, household income group and house type with awareness of food security.

The test statistics:

$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$	(1)
Where O_i is the observed frequency and E_i is the expected frequency.	

The null hypothesis of the test is that there is no relationship between the variables. The result determines whether there is a statistically significant association between the variables if p-value less than 0.05 meaning that there is a relationship between them. Conversely, if a p-value greater than 0.05 suggests that there is no significant association between the variables, and they are likely independent.

RESULTS AND DISCUSSION

Descriptive Analysis Results

Table 3 presents a descriptive analysis of the demographic profile of the 384 respondents who participated in the study.

Table 3 Demographic Profiles of Respondents

Variables	Count	Percentages
AGE GROUP	106	27.6
19-25 years	105	27.3
26-35 years	100	26
36-55 years	73	19
56-60 years		
GENDER	199	51.8
Male	185	48.2
Female		
EDUCATION LEVEL		
No formal education	48	12.5
Primary	41	10.7
Secondary	67	17.4
Diploma or equivalent	91	23.5
Bachelor's degree	88	22.9
Postgraduate or Higher	49	12.8
HOUSEHOLD		

INCOME	154	40.1
B40	120	31.3
M40	110	28.6
T20		
HOUSE TYPE		
High rise	64	16.7
Terrace/Semi-detached/Townhouse	186	48.5
Bungalow	64	16.7
Kampung house	70	18.2

From Table 3, the age distribution of respondents is balanced, with the largest group aged 19–25 years (27.6%), followed closely by those aged 26–35 years (27.3%) and 36–55 years (26.0%). The smallest age group comprises those aged 56–60 years, making up 19.0% of the sample. In terms of gender, females slightly outnumber males, accounting for 51.8% and 48.2% respectively. Educational attainment varies, with the highest proportion holding a diploma or equivalent (23.5%) and a bachelor's degree (22.9%). Other respondents reported secondary education (17.4%), postgraduate qualifications (12.8%), primary education (10.7%), and no formal education (12.5%).

Regarding household income, the majority fall within the B40 income group (below RM5,245), representing 40.1% of the sample. The M40 group (RM 5,256 – RM 11,819) makes up 31.3%, while 28.6% belong to the T20 group (above RM 11,820). Respondents also live in a variety of housing types, with the highest proportion residing in terrace, semi-detached houses or townhouses (48.5%), followed by kampung-style homes (18.2%), and both bungalows and high-rise units (16.7% each). This diverse demographic composition helps ensure that the findings reflect the broader community perspectives in Seremban.

To gain deeper insights into the community's understanding of food security, respondents were asked to self-rate their level of awareness as either low, moderate, or high, as shown in Fig. 1. This self-assessment provides a direct reflection of how individuals perceive their own knowledge and awareness of food security issues. The results show that 37.50% of respondents reported a moderate level of awareness, followed by 34.11% with a high level of awareness, and 28.39% with a low level of awareness. The findings suggest that while a significant proportion of the community recognises food security issues, there is still a considerable portion with lower levels of awareness, highlighting the need for targeted awareness programs.

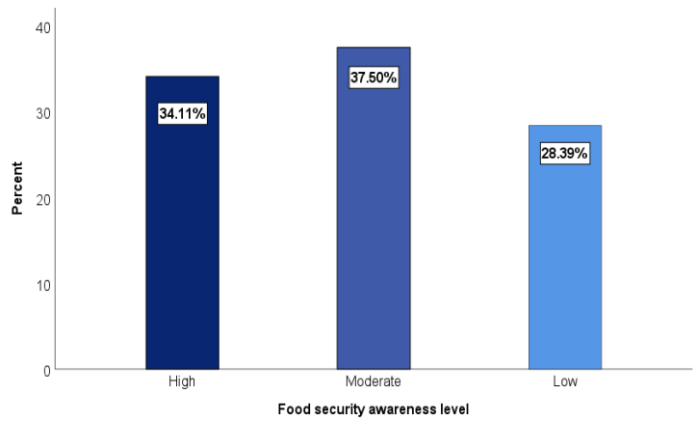

Fig. 1 Awareness level on food security

Association Between Demographic Characteristics with the Level of Food Security Awareness

The study aims to investigate whether demographic characteristics are dependent on the level of food security awareness. To achieve this, a Chi-Square Test of Independence was conducted. If a statistically significant association is found, it will suggest that the demographic factor is associated with respondents' awareness of food security. The null hypotheses tested are listed below, and the results can be found in Table 4.

H1:	There is no significant association between age group and food security awareness level.
H2:	There is no significant association between gender and food security awareness level.
H3:	There is no significant association between education level and food security awareness level.
H4:	There is no significant association between household income and food security awareness level.
H5:	There is no significant association between house type and food security awareness level.

Table 4 Chi-Square Test of Independence Results

Null Hypothesis	Statistic	p-value	Decision
H1	4.356	0.629	Do not reject null hypothesis
H2	2.369	0.306	Do not reject null hypothesis
H3	3.476	0.968	Do not reject null hypothesis
H4	7.351	0.118	Do not reject null hypothesis
H5	16.414	0.012*	Reject null hypothesis

* significant at 0.05.

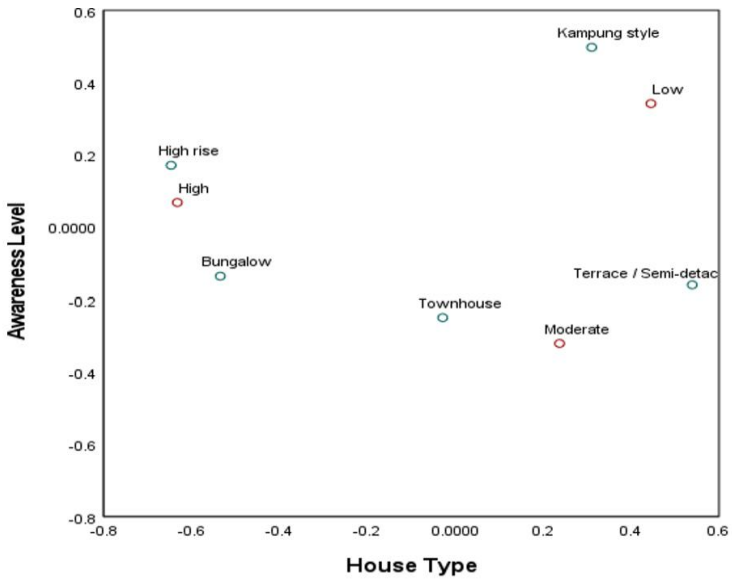

Fig. 2 Food Security Awareness by House Type

The Chi-Square Test of Independence was used to assess whether five demographic factors were associated with food security awareness among Seremban respondents. The results showed that most demographic characteristics, including age group ($p = 0.629$), gender ($p = 0.306$), education level ($p = 0.968$), and household income group ($p = 0.118$), did not have statistically significant associations with food security awareness level. This indicates that awareness levels were relatively similar across these groups.

However, a significant relationship was found for house type ($p = 0.012$), suggesting that the type of housing individuals live in may influence their awareness of food security. Based on plot in Fig. 2, respondents in high-rise and bungalow houses show higher levels of awareness, which could be linked to their generally higher income and education levels. These socioeconomic factors may provide greater access to information, healthier food choices, and stronger engagement with issues related to food security. In contrast, those in terrace, townhouse, or kampung-style houses tend to fall closer to the moderate or low awareness levels, possibly reflecting differences in economic resources and educational background.

The limited effect of demographic factors found in the Chi-Square analysis suggests that food security awareness among Seremban residents may not depend heavily on personal characteristics such as age, gender, or income. The findings of this study can be understood through the Knowledge Attitude Practice (KAP) model, which highlights that awareness is a vital first step toward behavioral change and the adoption of sustainable practices. The observed awareness levels may reflect the influence of shared community experiences and the dissemination of information through various channels, including social media and public awareness campaigns. Similar patterns have been reported in previous studies, where urban populations tend to exhibit comparable levels of awareness because of consistent exposure to national communication efforts [6][8]. Therefore, in an urban context like Seremban, awareness may spread uniformly across different social groups, reducing the demographic differences that are often more evident in rural settings.

CONCLUSION AND RECOMMENDATION

Conclusion

The findings reveal that 37.5% of participants had a moderate awareness level, 34.1% had a high level, and 28.4% had a low level. Most demographic factors did not significantly affect food security awareness, except for housing type. This indicates that living environments play a key role in shaping individuals' exposure and understanding of food-related issues. The results also show that while most respondents demonstrate moderate awareness of food security, higher awareness is more common among those living in high-rise and bungalow residences. Therefore, strategies to improve food security awareness should consider both the general need to raise awareness levels and the specific differences across housing types, ensuring that initiatives are targeted and effective.

Recommendation

This study highlights the need for targeted strategies to strengthen food security awareness among the Seremban community. Since house type was found to significantly influence awareness, tailored programs should be developed for residents. For example, respondents living in high-rise apartments and bungalows, who generally exhibit higher awareness and stronger socioeconomic status, could be engaged as leaders in promoting sustainable practices such as urban gardening, food waste reduction, and healthy consumption campaigns. In contrast, residents of terrace houses, semi-detached homes, and townhouses, who show moderate awareness, would benefit from neighbourhood-based initiatives such as community gardens, food cooperatives, and cost-saving workshops. For families living in kampung households, where awareness is lower despite being close to traditional food sources, tailored training on food storage, safety, and modern farming techniques can help address knowledge gaps.

Awareness campaigns should also be community-driven, involving local leaders, schools, and organisations to ensure consistent outreach across different demographic groups. From a policy perspective, local authorities are encouraged to integrate food security awareness into urban planning and community development strategies, particularly by supporting urban farming initiatives, household food storage education, and sustainable consumption practices. In addition, embedding food security topics into school curricula and community education programs would foster long-term awareness, preparing future generations to face food-related challenges.

The absence of significant associations for age, gender, education, and income may suggest that food security information is homogeneous within the community. Public messaging and online awareness campaigns,

especially following the COVID-19 pandemic, may have reached all demographic groups equally, reducing variation. Additionally, interaction effects could exist; for instance, higher education may only improve awareness among specific income levels, suggesting that multivariate approaches such as logistic regression could uncover deeper relationships in future research.

Finally, future research could compare food security awareness in different regions of Malaysia to see if there are differences across communities. Studies over time would also help to track changes in awareness, especially after new policies or economic challenges. It would be useful to look not only at awareness but also at actual household practices such as food choices, storage, and waste. Qualitative approaches like interviews could also give deeper insights into why some groups are more prepared than others.

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