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Food Safety Knowledge among Street Food Vendors: Case of Demerara-Mahaica, Guyana

Tandeka Barton[1]*, Michael Olabode Tomori[1], Dwayne Renville[2], Linda Francois[2]
[1]*Department of Public Health, Texila American University, Georgetown, Guyana*
[2]*Department of Mathematics, Physics and Statistics, University of Guyana, Georgetown, Guyana*

Abstract

Although street food vending is deeply embedded in our daily communities' economic and cultural life worldwide, it continues to pose significant public health risks due to the prevalence of foodborne illnesses. Research shows that street food vendors often lack adequate food safety knowledge, underscoring the need for local assessments. This study investigates the demographic profile and food safety knowledge of street food vendors in the Demerara-Mahaica region of Guyana, where enforcement of food safety regulations is limited. Based on a representative sample of 104 vendors, females outnumbered males by a 3:2 ratio. Although Guyana is a multi-ethnic society, nearly half of the study's vendors were Africans. Most vendors (88.4%) had at least a secondary-level education, primarily obtained locally (80.8%). However, nearly 60% of the vendors in the study had not received formal food safety training. While many vendors showed awareness of basic hygiene, gaps remain in their knowledge of specific foodborne pathogens and proper food handling practices. Notably, 31.7% of street food vendors expressed uncertainty about the risks of foodborne diseases. The study also found a statistically significant association between vendors' food safety knowledge and the type of district (urban versus rural) in which they operate. These findings highlight the urgent need for targeted training programs and regulatory reforms to enhance food safety compliance among street food vendors in Guyana. Future research should assess the impact of regulatory enforcement and the effectiveness of widespread, consistent food safety education initiatives.

Keywords: *Food Safety, Guyana, Street Food Vendors, Training Needs, Vendor Knowledge.*

Introduction

The urban landscape is increasingly characterised by street food vending, a vital source of nourishment and livelihood for many. However, the relationship between street foods and foodborne illnesses makes street food vending a global concern. Numerous studies have demonstrated (a) the high prevalence of contaminants, such as pathogens, in street foods and (b) that poor food safety knowledge among street food vendors poses a major issue. Moreover, the extent of these problems varies according to unique blends of contextual factors, significantly influencing the health risks posed to consumers. Therefore, public health experts and practitioners must comprehensively understand these dynamics to enhance food safety measures and implement effective interventions.

Food contamination is a global concern. On the one hand, according to the World Health Organisation (WHO), ten percent of the world's population suffers from foodborne illnesses yearly, and children account for one in every three deaths caused by foodborne diseases [1]. Consequently, this situation hinders improvements in societies' socioeconomic

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****Corresponding Author: tandekabarton@gmail.com***

dimensions by, for example, overburdening the public health system and the economy. On the other hand, about 2.5 billion people eat street food on an average day [2], underscoring the critical role of street food vendors in providing affordable and accessible food to urban populations, contributing to the economy, and impacting the food value chain. However, despite the noble intentions of street food vendors, studies have confirmed high levels of contamination in street foods, suggesting a relationship between the prevalence of street-vended foods and that of foodborne illnesses [3, 4]. Addressing the challenges in the street food vending industry is necessary to protect public health and strengthen food systems.

Scholars have pointed to prominent aspects of street food vending that can potentially make foods unsafe. These include a poor or nonexistent regulatory framework, weak oversight and enforcement, inadequate infrastructure, unacceptable levels of vendors' knowledge, attitudes and practices, and carefree vendors. While these areas are interdependent and call for an integrated approach to ensure food safety, a data-supported understanding of each aspect is equally important.

Inadequate food safety knowledge among vendors is a risk factor for foodborne illnesses. This study evaluates the food safety knowledge of street food vendors in Demerara-Mahaica, focusing on assessing hygiene practices, food handling protocols, and contamination risks. Street food vending in Guyana is mainly informal and presents several challenges. Firstly, a survey conducted in Guyana in 2024 found a high prevalence of unacceptable levels of aerobic plate counts (APC) in street foods [5], indicating microbial contamination and highlighting the need for further studies and actions to improve food safety in Guyana. Secondly, there is no evidence of a previous assessment of vendors' food safety knowledge. Thirdly, the lack of formal regulatory oversight raises concerns about vendor compliance with safety standards. As a result, ensuring the safety of street vended foods remains a significant public health challenge. It is imperative to explore the level of vendors' knowledge of food safety and how this relates to certain demographic factors. This allows us to gather perspectives and draw comparisons from global and regional studies as street food vending is explored in Guyana's context. The findings will provide a foundation for potential interventions and targeted efforts to strengthen food safety education and contribute to better public health outcomes while supporting vendors' livelihoods.

Some studies worldwide have shown good to excellent vendors' food safety knowledge scores [6–9], but others have demonstrated significant deficiencies [10–12]. This includes their knowledge of food safety requirements for preparing, storing, and selling foods and their awareness of food safety regulations. A systematic review and meta-analysis examining street food vendors in low- and middle-income countries reported that many vendors demonstrated limited knowledge of food safety regulations [13]. The study estimated that nearly 40% lacked awareness of basic food safety requirements for safeguarding public health. In Barbados, it was found that while street food vendors generally exhibited a positive attitude toward hygiene, many demonstrated a limited understanding of specific food safety risks, including those related to microbial contamination [14]. Similarly, a study in the Philippines found that although vendors had basic knowledge of personal hygiene and food contamination, gaps existed in understanding food legislation and waste management [15]. Further, a study that assessed street food vendors' knowledge, attitudes, and practices in Windhoek revealed that while vendors possessed general food safety knowledge, their understanding of specific microbial hazards was limited [16]. These deficiencies relate to several factors: educational background, socioeconomic

standing, food handling training, culture, regulations, and oversight.

Street food vendors often operate in environments where formal education is not required. Many vendors have been found to rely on personal intuition or informal education, with studies indicating that a significant portion have not received formal training in food hygiene practices [17, 18]. This lack of formal education is evident in several regions and is often linked to lower educational attainment among food handlers. Studies have consistently illustrated a positive correlation between educational attainment and food safety knowledge, where, for example, in Taunggyi Township, Myanmar, vendors with higher education levels demonstrated better food safety knowledge compared to those with less education, a trend echoed in multiple contexts, including China [7, 19]. Although some studies indicate that vendors possess basic food safety knowledge, significant gaps persist in understanding foodborne pathogens, contamination risks, and disease transmission [20]. For example, 2% of street food vendors in Lesotho could correctly identify *Salmonella* as a foodborne pathogen [12]. While vendors frequently practised hand washing, their understanding of utensil cleaning and cross-contamination prevention was inadequate. Moreover, some studies have found vendors' knowledge of food safety to be significantly related to their educational attainment [7, 9, 20, 21].

Socioeconomic factors play a crucial role in shaping food safety knowledge. In Bangladesh, a recent study indicated that household income significantly correlated with food safety knowledge among street vendors [10]. Vendors with higher incomes were more likely to invest in formal training and thus acquire better food safety practices. This is critical, as inadequate knowledge and training among vendors can lead to increased foodborne illness outbreaks, as demonstrated in studies from various countries [13, 22]. Moreover, disconnections between knowledge and practice are linked to financial constraints that forced vendors to prioritise cost-saving measures over safety [15]. Addressing the socioeconomic barriers that limit access to food safety training should be a priority for public health interventions.

Alongside education and socioeconomic factors, food safety vendors' training is essential in cultivating positive attitudes towards food safety [6]. Findings from Jordan point to a direct relationship between knowledge, attitudes, and food safety practices among street vendors [23]. Those who received training exhibited higher knowledge and better hygiene practices, reinforcing that educational interventions can enhance understanding and the practical application of food safety measures. In Ethiopia, it was found that street vendors who participated in training programs exhibited improved compliance with food safety measures [24].

Understanding culture and local perceptions of food safety is key when investigating the practices of street food vendors. A study examining perceptions in Kumasi, Ghana, revealed that vendors often prioritise local, culturally ingrained practices over formal safety protocols, potentially leading to unsafe food handling practices [25]. Such cultural considerations must be integrated into food safety training programs to make them more effective, as ignoring these elements may result in resistance to adopting new practices.

Finally, systemic issues relating to regulatory oversight also need to be addressed. Many street vendors operate under limited government oversight, which exacerbates the risks associated with food safety. A lack of enforcement of food safety regulations has been noted in numerous studies, resulting in unsafe food handling practices [11]. This calls for increased governmental involvement in training programs and the establishment of standards that all vendors must meet to operate legally. Research in Lesotho and Namibia underscores the need for stricter enforcement

mechanisms, such as regular inspections, penalties for non-compliance, and incentives for vendors adhering to food safety regulations [12, 16].

The literature indicates that street food vendors in developing countries often lack food safety knowledge. While vendors may understand basic hygiene practices, their knowledge of microbial contamination, foodborne illnesses, and regulatory compliance remains limited. Any genuine attempt at addressing street food vendors' food safety knowledge must gather information from various interconnected factors, including demographics such as education, income levels, training accessibility, and local perceptions.

In Demerara-Mahaica, Guyana, national food safety regulations exist without adequate enforcement in the street food sector. Further, Guyana lacks a formalised training framework for street food vendors, highlighting an urgent need for intervention. Therefore, this study seeks to investigate food safety knowledge among vendors as an initial step towards improving food safety.

Materials and Methods

Study Design and Area This study employed a cross-sectional survey to assess food safety knowledge among street food vendors in Demerara-Mahaica, Guyana. Data was collected from April 1 to June 30, 2024, through structured interviews with vendors operating in 14 communities outside Georgetown and 18 locations within the city. The region, known for its high population density and vibrant street food culture, provided a diverse sample for the study.

Sampling Method Due to the unregulated nature of night street food vending and the absence of an official vendor registry, convenience sampling was employed. A total of 104 vendors were selected based on their availability and willingness to participate. This non-random approach ensured a practical and representative dataset despite inherent limitations.

Data Collection Personal interviews using a structured questionnaire (Knowledge section) were conducted to gather quantitative data. A team of 36 professionals facilitated data collection, including Environmental Health Officers, Environmental Health Assistants, Veterinary Public Health Inspectors, Government Analyst Food and Drug Department (GA-FDD) Inspectors, and Meat and Food Inspectors. Interviews were conducted on Thursday, Friday, Saturday, and Sunday evenings between 18:00h and 24:00h to accommodate vendors' operational hours.

Survey Instrument The questionnaire was adapted from other studies [10, 19, 26] that conducted similar research in different contexts. It consists of two main sections: demographic characteristics and food safety knowledge. The demographic section included questions on district, gender, age, ethnicity, education level, training history, and vendor location. The food safety knowledge assessment comprised 18 multiple-choice questions addressing key concepts such as foodborne pathogens, contamination risks, hygiene practices, and disease transmission. Vendors responded by selecting “Yes,” “No,” or “Don’t Know.”

Interview Procedure Trained interviewers conducted face-to-face interviews at vendor stalls. To ensure clarity and completeness of responses, vendors were briefed on the study’s objectives, confidentiality was assured, and informed consent was obtained. The structured question-and-response format minimised response bias and gave an in-depth understanding of food safety awareness. Efforts were made to mitigate sampling bias through standardised data collection protocols and quality control measures.

Data Analysis Quantitative data from the questionnaires were analysed using descriptive and inferential statistical methods. Frequencies and percentages were calculated to identify

demographic characteristics and food safety knowledge trends. Statistical analysis was performed to determine patterns and relations in awareness levels among vendors. This was accomplished in a few steps. First, values of 1 and 0 were assigned to represent a favourable response and an unfavourable response, respectively, for the Yes/No items for which these constructs were primarily assessed. The 'Don't Know' option was not considered nor assigned a value. Second, given that the most expected or favourable responses to items were the 'Yes' option, this was assigned the value 1 by default. Third, in cases where the 'No' option was expected or favourable, reverse coding allowed the 'No' to be assigned the value 1 instead. Finally, the sum of these outcomes provided a helpful representation of the respondents' general knowledge. The 5% significance level was applied to all hypothesis tests.

Closer examination of the data using the Q-Q plot and the Shapiro-Wilk test showed that normality is not satisfied (p-value<0.001) for the knowledge scores. Consequently, no further parametric analysis was done. Instead, the knowledge scores were grouped into two categories for non-parametric analysis with respect to the demographic variables. The score was considered poor if it was 10 or less; otherwise, it was considered good. The Chi-square test was employed to test the independence of knowledge scores and demographic characteristics. Four of the variables were reclassified into fewer groups to satisfy the underlying assumptions of Pearson's Chi-square analysis. Further, to enable determining the odds ratio, the outcomes of each variable were classified into two groups. First, Age is regrouped as Youth (18 – 35) and Senior (36+). Second, since Africans represent about 50% of the sample, Ethnicity is regrouped as Africans and Others. Third, education is regrouped as Up to Secondary and Post-Secondary. Finally, Food Handling experience is regrouped into Up to 5 years and Over 5 years.

Ethical Considerations

Ethical approval for this study was obtained as part of a larger research project (see Appendix). Participants provided informed consent before participating, and data confidentiality was strictly maintained.

Results

Vendors Demographic Characteristics

Table 1 itemises the distribution of the demographic characteristics of street food vendors. The female street food vendors outnumbered the males by a ratio of 3:2. Regarding their age, about two-thirds of the vendors were 26 – 45 years old. The vendors were of six ethnicities; just less than 50% were Africans, and, in contrast, the Amerindians and Chinese accounted for one percent each. The vast majority (88.4%) had at least a secondary education, and most (80.8%) reported that their education was locally obtained. Over half of the vendors have been in business for less than five years, and 23.1% have more than 10 years of experience. Similarly, those with no relevant training outnumbered those with training by almost a 3:2 ratio.

Table 1. Demographic characteristics of street food vendors.

Variable	Options	N	%
District	**Rural**	**36**	**34.6%**
	Urban	**68**	**65.4%**
Gender	Male	40	38.5%
	Female	64	61.5%
Age Range	18 - 25	13	12.5%
	26 - 35	36	34.6%

	36 - 45	33	31.7%
	46 - 55	17	16.3%
	56 - 60	3	2.9%
	> 60	2	1.9%
Ethnicity	African	51	49.0%
	Mixed	27	26.0%
	East Indian	11	10.6%
	Chinese	1	1.0%
	Amerindian	1	1.0%
	Spanish	13	12.5%
Education Level	Nursery	1	1.0%
	Primary	10	9.6%
	Secondary	73	70.2%
	University	17	16.3%
	Postgraduate	2	1.9%
	Missing (System)	1	1.0%
Education Location	Studied in Guyana	84	80.8%
	Studied outside Guyana	19	18.3%
	Missing (System)	1	1.0%
Years of Experience	< 1 year	22	21.2%
	1 to <5 years	36	34.6%
	5 to 10 years	22	21.2%
	> 10 years	24	23.1%
Food Safety Training	No	61	58.7%
	Yes	43	41.3%

Source: Adopted from [5].

Vendors Knowledge

Table 1 lists the vendors' summary responses to the 18 knowledge items on the questionnaire. For example, K1 represents the statement 'Abortion in pregnant women can be induced by foodborne disease' to which 16 (15.4%) of the 104 vendors responded 'No,' 55 (52.9%) responded 'Yes,' and 33 (31.7%) responded 'Don't Know.' All items had a 100% response rate. Whereas 'Yes' was the correct response for most of the items, the correct response was 'No' for K13 and K15. Eight of the items saw over 75% correct responses: K2, K3, K4, K11, K12, K14, K16, and K18. The highest percentage (96%) of correct responses was made to K16, proper cleaning and sanitization of utensils decreases the risk of food contamination. In contrast, K6 and K9 saw less than 50% correct responses. The highest incorrect responses went to K15 where 39.4% of vendors suggested that *food prepared in advance reduces the risk of food contamination.* Regarding uncertainty, six items saw less than 10% of vendors selecting 'Don't Know': K4, K11, K12, K15, K16, and K18. Items K6 and K9 had the highest percentage of 'Don't Know' responses with 52.9% each.

Table 2. Vendors Responses to Knowledge Items

Questionnaire Items		**Responses n (%)**		
		No	**Yes**	**Don't Know**
K1	Abortion in pregnant women can be induced by foodborne disease.	16 15.4%	55 52.9%	33 31.7%
K2	Bloody diarrhoea can be transmitted by food.	13 12.5%	78 75.0%	13 12.5%
K3	Swollen cans can contain microorganisms.	9 8.7%	81 77.9%	14 13.5%
K4	During infectious diseases of the skin, it is necessary to take leave from work.	4 3.8%	94 90.4%	6 5.8%
K5	Eating and drinking in the workplace increases the risk of food contamination.	25 24.0%	68 65.4%	11 10.6%
K6	Hepatitis A virus is a foodborne pathogen.	21 20.2%	28 26.9%	55 52.9%
K7	Microbes are in the skin, nose, and mouth of healthy food handlers.	20 19.2%	67 64.4%	17 16.3%
K8	Salmonella is among the foodborne pathogens.	8 7.7%	54 51.9%	42 40.4%
K9	Staphylococcus is among the foodborne pathogens.	8 7.7%	41 39.4%	55 52.9%
K10	Influenza can be transmitted by aerosols rather than food.	11 10.6%	69 66.3%	24 23.1%
K11	Using gloves while handling food reduces the risk of food contamination.	6 5.8%	98 94.2%	0 0.0%
K12	Washing hands before work reduces the risk of food contamination.	5 4.8%	98 94.2%	1 1.0%
K13	*AIDS can be transmitted by food.*	76 73.1%	10 9.6%	18 17.3%
K14	Children, healthy adults, pregnant women, and older individuals are at equal risk for food poisoning.	8 7.7%	83 79.8%	13 12.5%
K15	*Food prepared in advance reduces the risk of food contamination.*	55 52.9%	41 39.4%	8 7.7%
K16	Proper cleaning and sanitisation of utensils decreases the risk of food contamination.	3 2.9%	100 96.2%	1 1%
K17	Reheating cooked foods can contribute to food contamination.	24 23.1%	64 61.5%	16 15.4%
K18	Washing utensils with detergent leaves them free of contamination.	15 14.4%	85 81.7%	4 3.8%

Based on the total score for the knowledge items, most of the vendors (83) ranged between 10 and 16 out of a maximum of 18 points for knowledge. Table 3 outlines the distribution of the total knowledge scores; there were no scores of 7 or 18. The 'Fair' category included twelve vendors who responded with 'Don't Know' for most of the items and performed

poorly with scores of six or less. The total number of vendors who performed poorly is 25, and correspondingly, 79 for those with good performances.

Table 3. Distribution of the Total Knowledge Score of Vendors

	Knowledge Score Categories		
	Range	**N**	**%**
Poor	0 – 10	25	24.0%
Good	11 – 18	79	76.0%

Figure 1 shows the bar charts for cross-tabulating the knowledge score categories and those of the demographic variables, labelled a to g. In all cases, the general pattern of the heights of the columns is similar for the options in each demographic variable. This indicates that the frequencies are similar for the possibilities and indicate their independence.

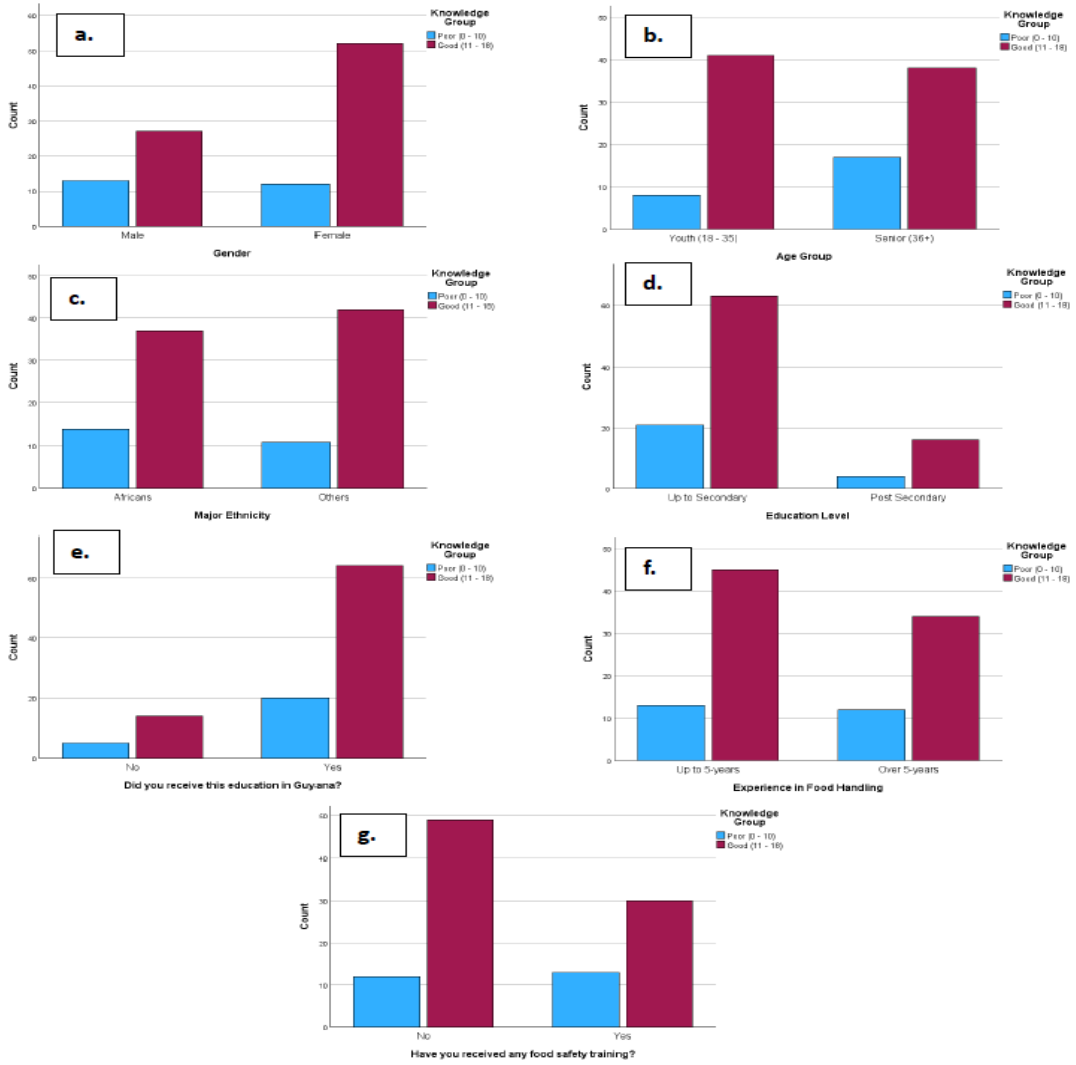

Figure 1. Clustered Bar Charts Comparing Knowledge and Each of the Demographic Variables

Table 4 shows the summary results of comparing knowledge score categories against the options for the demographic characteristics. None of the Chi-square p-values is less than 0.05, and therefore, we must conclude that there is no evidence to suggest that the knowledge score categories are dependent on the options for any of the demographic variables. In other words, knowledge is found to be independent of all demographic variables in the study. Further, the odds ratio analyses were conducted, and as in the case of the Chi-square test, none of the odds ratio was found to be significant. Nevertheless, Table 4 shows that females are twice as likely to have a good knowledge score as their male counterparts. Similarly, young people and those with food safety training are approximately twice as likely to gain a good knowledge score compared to seniors and those with food safety training. The other odds ratios are of smaller value.

Table 4. Test of Association and Odds Ratio between Vendors' Knowledge and Demographics

Demographic Characteristic	**Categories**	**Chi-square p-value**	**Odds Ratio**	**Knowledge is Dependent/Independent**
D1: Gender	Male/Female	0.110	2.086	Independent
D2: Age	Youth/Senior	0.082	0.436	Independent
D3: Ethnicity	African/Other	0.424	1.445	Independent
D4: Education	Up to Secondary/Post-Secondary	0.638	1.333	Independent
D5: Guyana Education	Yes/No	0.818	1.143	Independent
D6: Food Handling Experience	Little/Much	0.663	0.819	Independent
D7: Food Safety Training	Yes/No	0.215	0.565	Independent

Finally, we present the only comparison that produced significant results at the 5% level. This compares knowledge score categories with the district (rural/urban) where the vendors operate. Figure 2 illustrates the disparity in the good versus poor knowledge counts for the rural and urban vendors. The poor knowledge (blue column) is significantly lower for rural vendors than urban vendors. Further, the Chi-square analysis produced a p-value of 0.006, which is significant and asserts that food safety knowledge is dependent on the type of district the vendor operates in. The odds ratio test corroborates this, as vendors from rural communities are found to be more than five times more likely to have good food safety knowledge than those from city areas.

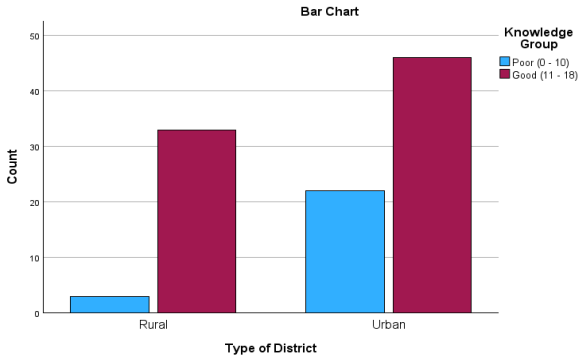

Figure 2. Bar Chart Showing the Cross-Tabulation Vendors' Knowledge and District.

Discussion

This study evaluated food safety knowledge among night street food vendors in the Demerara-Mahaica region, focusing on their awareness of hygiene practices, foodborne pathogens, and contamination risks. It also examined formal food safety training coverage and identified critical knowledge gaps potentially affecting compliance with safe handling standards. These findings inform the design of targeted training programs and policy interventions to enhance vendor practices and overall food safety in the street food sector.

Demographically, the vending population is diverse in experience and training. Gender distribution indicated a predominance of female vendors, who comprise 61.5% of the street food vending population, underscoring women's significant role in the sector. Most vendors fall within the 26–45 age range, suggesting that street vending is a common economic activity among young to middle-aged adults [6]. In multi-ethnic Guyana, Africans represented the largest ethnic group at 49%, followed by mixed ethnicity (26%), Spanish (12.5%), East Indians (10.6%), and small proportions of Chinese and Amerindian vendors (1% each). Educational attainment is relatively high, with 88.4% having at least a secondary education and 80.8% educated locally, indicating a generally literate and potentially trainable workforce. This accessibility to local education suggests a foundational understanding that may facilitate engagement with food safety training and regulatory compliance initiatives [6].

While vendor experience varied, with over half having less than five years in the trade and 23.1% having more than a decade, the findings suggest both turnover and continuity within the sector. Nearly 60% of vendors lacked formal food safety training, raising concerns about safe food handling practices [6]. These findings echo prior research, which noted that vendors can adopt safe food practices when given access to appropriate training [27].

Analysis of the 18 knowledge-based questions highlighted both strengths and deficiencies in vendor understanding. While 90.4% correctly indicated that individuals with infectious skin conditions should take leave from work, only 52.9% knew that foodborne diseases can cause abortion in pregnant women, with 31.7% unsure. Eight items elicited over 75% correct responses, reflecting a basic grasp of key food safety concepts.

Notably, vendors showed strong awareness of hygiene practices, such as the importance of cleaning and sanitising utensils. However, their limited knowledge of pathogens like *Hepatitis A* and *Staphylococcus* indicated critical knowledge gaps. High uncertainty on specific items, particularly related to microbiological hazards, suggests the need for more in-depth, targeted education [4, 20, 28].

One concerning misconception was the belief that preparing food in advance reduces contamination risk. This, alongside low “Don’t Know” response rates—under 10% for six items—suggests misplaced confidence even when knowledge is lacking. Items K6 and K9, which attracted the highest uncertainty, further underscore the need for precise interventions to bridge specific knowledge gaps. These findings are consistent with studies showing variation in food safety knowledge among food workers and students [29].

Statistical analysis revealed no significant associations between food safety knowledge and demographic variables such as gender, age, and education, suggesting these alone do not determine knowledge levels. Rather, external factors like training access and regulatory exposure may be more influential. This contrasts with studies where demographic factors were significant predictors of knowledge [6, 7, 9, 10, 20, 21, 26, 30].

Nevertheless, odds ratio analysis revealed some trends. Female vendors were twice as likely as males to achieve good knowledge scores, aligning with literature on gender-related differences in food safety awareness

[31]. Younger vendors and those with formal training also tended to perform better, reaffirming the value of structured educational interventions [27]. It is important to note that financial limitations and lack of awareness of food legislation, as observed in the Philippines, further complicate safe food practices among vendors [15].

Scholars advocate tailoring training to specific audiences, acknowledging varied learning styles, cultural contexts, and prior knowledge levels [32]. Effective programs should aim not only to impart knowledge but also to shift behaviours [4]. Yet, structural barriers remain. In Ghana, regulatory fragmentation limited the practical benefits of food safety training, even when knowledge was adequate [6]. A similar challenge exists in Demerara-Mahaica, were overlapping mandates among regulatory agencies complicate enforcement and training delivery. This highlights the need for a coordinated framework offering standardised, continuous training with regular assessments.

Importantly, a significant relationship was found between knowledge levels and the type of district, aligning with earlier research showing similar trends [10]. Rural vendors displayed superior food safety knowledge ($p = 0.006$), a finding further supported by odds ratio analysis, which showed they were over five times more likely than their urban counterparts to score well. This advantage likely stems from traditional handling practices, better access to fresher ingredients, and fewer infrastructural constraints [31]. In contrast, urban vendors often face tighter spaces, higher consumer demand, and limited access to formal training, which may heighten food safety risks [15]. Although district type was the only demographic variable significantly linked to knowledge, similar patterns have been observed in other contexts [6, 20, 26].

Bridging these disparities requires localised interventions responsive to each context's unique challenges. Standardised training, improved enforcement, and expanded access to food safety education are essential [6]. As other studies note, socioeconomic and environmental constraints, such as inadequate access to clean water and waste disposal, can inhibit the application of food safety knowledge, regardless of formal education [4, 20, 31].

The WHO supports continuous food safety education, advocating regular refresher courses and risk-based training approaches [8]. Integrating mobile platforms and digital tools may improve reach, particularly among younger vendors. Public campaigns can also shift consumer expectations, encouraging vendors to prioritise safety. Multi-sectoral collaboration, involving government, Non-Governmental Organisations (NGOS), and private partners, will be vital to sustaining long-term improvements [21]. Notably, infrastructure and access to resources are as critical as education in ensuring food safety compliance [9].

Fragmented regulation remains a pressing issue in Demerara-Mahaica. Without unified oversight and enforcement, training initiatives may be inconsistently implemented. A structured policy mandating food safety training as a precondition for operation, coupled with routine monitoring, is essential. Enhanced collaboration across regulatory agencies can further strengthen compliance.

This study has some limitations. First, responses may have been influenced by the presence of the researcher, introducing potential social desirability bias. Second, since the study was confined to Demerara-Mahaica, the findings may not be generalisable to other regions with differing socio-economic conditions. Third, while the study assessed knowledge, it did not measure the translation of this knowledge into behaviour—area future research should address.

Moving forward, longitudinal studies tracking knowledge retention and behavioural change post-training are essential. Further research should also explore infrastructure-

focused interventions, such as the development of designated vending zones with sanitation facilities. Lastly, comparative studies across multiple regions in Guyana would help build a more complete understanding of food safety dynamics in varying contexts.

Conclusion

This study offers a timely and necessary understanding of the demographic characteristics, experience, training, and food safety knowledge of night street food vendors in the Demerara-Mahaica region. The findings revealed a predominantly female vendor population, concentrated within the 26–45 age range, and marked by relatively high educational attainment. Yet, despite their role in public food provision, nearly 60% of vendors lacked formal food safety training.

While vendors demonstrated general awareness of basic hygiene practices, substantial knowledge gaps persist regarding foodborne pathogens and contamination risks. Notably, gender, age, and education showed no statistical association with food safety knowledge, but rural vendors exhibited significantly higher knowledge levels—likely reflecting differences in traditional practices and operational contexts.

Misconceptions about contamination risks underscore the urgent need for structured, continuous training tailored to enhance vendors' understanding of foodborne hazards. Encouragingly, the demographic profile points to a trainable workforce, supporting the potential effectiveness of targeted interventions. Addressing these gaps will require comprehensive efforts that integrate education, regulatory oversight, and financial or social support mechanisms to facilitate safer practices, particularly among economically constrained vendors.

Given the public health stakes, coordinated action among government agencies, regulators, and stakeholders is essential to implement sustainable food safety solutions. Future research should evaluate the long-term impact of structured training programs on vendor behaviour and extend comparative analyses across regions in Guyana. Further exploration of regulatory enforcement mechanisms is also warranted to understand their role in shaping food safety compliance. Bridging the structural and educational gaps identified in this study will be critical to reducing foodborne illness and safeguarding consumers and vendors alike.

Conflict of Interest

The authors have no conflict of interest.

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