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Dr. Jenifer Antony

Assistant Professor,
Department of Clinical Nutrition
and Dietetics, PSG College of
Arts & Science, Coimbatore,
Tamil Nadu, India

Food safety knowledge and hygienic practices among street food vendors in Coimbatore, India

Jenifer Antony

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Abstract

Street food plays a vital role in urban life, especially in developing countries, by offering affordable and accessible meals. However, poor hygiene and inadequate food safety knowledge among vendors pose significant public health concerns. This study assessed the food safety awareness and hygiene practices of 300 randomly selected street vendors in Coimbatore, Tamil Nadu, using structured questionnaires and direct observations. Key aspects such as personal hygiene, food handling, and storage practices were analysed. Results showed that 47.0% of vendors were aged 31-40 years, with 34.3% having completed schooling, while 28.0% were uneducated. Only 60.7% practiced proper handwashing, and 74.7% lacked protective gear. A significant association was found between education level and food safety awareness ($p = 0.005$). The findings highlight the need for targeted training programs and stricter regulations to improve food safety standards, ultimately reducing health risks associated with street food consumption.

Keywords: Street food, food safety, hygiene practices, public health, Coimbatore

Introduction

Street food refers to ready-to-eat food and beverages prepared and sold by vendors in public places, such as roadsides and marketplaces. The consumption of street food is particularly high in developing countries due to its affordability and accessibility. It is estimated that around 2.5 million people consume street food daily (Samapundo *et al.*, 2015) ^[1]. In countries like India, the rapid urbanization and growing population have contributed to the expansion of the informal sector, which includes street food vendors. These vendors operate without permanent structures and often fall outside government regulations, making food safety a major concern (Chander Pal Thakur *et al.*, 2013) ^[2].

Despite its popularity, street food poses significant public health risks due to microbial contamination and environmental pollution. The lack of adherence to hygiene protocols often results in foodborne illnesses, including diarrheal diseases (Schlundt *et al.*, 2004) ^[3]. Proper food safety practices are crucial to reducing such risks, and food vendors must be educated on hygiene standards before selling food to the public (AIHazmi *et al.*, 2021) ^[4]. Poor sanitary conditions, lack of awareness regarding food storage temperatures, and inadequate personal hygiene among vendors are major contributors to foodborne illnesses (Geethamani & Arulanand Kathirvel, 2016) ^[5].

Globally, the World Health Organization (WHO), 2020 ^[6] estimates that unsafe food consumption leads to approximately 600 million cases of foodborne diseases and 420,000 deaths annually. In developing nations, around 70% of diarrheal diseases are linked to contaminated food, with children being the most vulnerable group (Hassan, 2020) ^[7]. Ensuring food safety and hygiene is therefore an essential aspect of public health, as it helps prevent cross-contamination, spoilage, and microbial invasion.

The Food Safety and Standards Authority of India (FSSAI) emphasizes the need for street food vendors to have proper knowledge of food handling, storage, and preparation to minimize foodborne illnesses. Vendors should also follow hygiene practices such as wearing clean head caps, aprons, gloves, and maintaining cleanliness in their workspaces (Kalpana *et al.*, 2019) ^[8]. Improper handling of ingredients, use of untreated water, and unhygienic food storage are major causes of foodborne diseases (Zhongqin Pan *et al.*, 2021) ^[9].

The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act protects the rights of street vendors while emphasizing the importance of food safety. Proper education and training of vendors can significantly reduce the occurrence of foodborne illnesses. Effective communication models, identification of contamination sources, and implementation of critical control points are essential steps toward ensuring food safety in the street food

Corresponding Author:**Dr. Jenifer Antony**

Assistant Professor,
Department of Clinical Nutrition
and Dietetics, PSG College of
Arts & Science, Coimbatore,
Tamil Nadu, India

sector (Todd *et al.*, 2007) ^[10]. This study aims to assess the food safety knowledge and hygienic practices of street vendors in Coimbatore, India, to improve the overall safety and quality of street food.

Materials and Methods

The present study was conducted to assess the food safety knowledge and hygienic practices among street food vendors in Coimbatore, Tamil Nadu. The research aimed to evaluate vendors' awareness regarding food safety, hygiene, and potential risks associated with street food vending. This study followed a descriptive cross-sectional design. A cross-sectional study is an observational research method that collects data from a randomly selected population at a single point in time. It is commonly used to determine the prevalence of specific behaviours, practices, or conditions within a target group. Additionally, this approach is cost-effective and provides valuable insights into the existing food safety knowledge and hygiene practices among street vendors. The study focused on various locations across Coimbatore where street food vendors operate, including marketplaces, busy roadsides, and industrial areas. The study population comprised street food vendors engaged in selling ready-to-eat food and beverages at roadside stalls, fast food stalls, portable snack vendors, and petty shops. These vendors were randomly selected to ensure a diverse representation of food sellers operating in different parts of Coimbatore. A total of 300 street food vendors participated in the study, with the sample size determined to provide a comprehensive evaluation of food safety knowledge and hygiene practices among vendors. The study included vendors selling various types of street foods, snacks, beverages, and other ready-to-eat items.

Data collection was carried out using a structured questionnaire designed to assess the hygiene practices and food safety knowledge of street food vendors. The questionnaire included various aspects such as personal hygiene practices (e.g., handwashing habits and use of protective clothing), food handling and storage (e.g., knowledge of temperature control and separation of raw and cooked foods), workplace cleanliness (e.g., sanitation of food preparation areas and waste disposal practices), and food safety awareness (e.g., understanding contamination risks and knowledge of food safety regulations). In addition to administering the questionnaire, direct physical observations were made to assess the actual hygiene and food safety practices followed by the vendors. The collected data were statistically analysed using SPSS 26.0 version to provide a clear understanding of the food safety knowledge and hygienic practices of street food vendors.

Results and Discussion

The study aimed to assess the food safety knowledge and hygienic practices among street food vendors in Coimbatore. The data collected covered aspects of cleanliness, hygiene, daily practices, and knowledge. The results showed that the majority of street food vendors (47.0%) belonged to the age group of 31-40 years, followed by 32.3% in the 21-30 years category. Only a small proportion (4.3%) were above 50 years old. In terms of educational qualification, 34.3% of vendors had completed schooling, 28.0% were uneducated, and 19.7% and 18.0% had completed diploma and graduate education, respectively. The findings highlight that a significant proportion of vendors had limited formal education, which could impact their understanding of food safety measures.

The study revealed that the majority of street food vendors (57.3%) prepared ready-to-eat food items, followed by ready-to-cook products (36.0%), with beverages being the least common (6.7%). Regarding hygiene practices, it was observed that 60.7% of vendors followed proper handwashing practices during meal preparation, whereas 39.3% did not. Alarming, 74.7% of vendors did not use protective gear such as gloves, hair caps, or aprons while cooking. Nail hygiene was better maintained, with 63.7% of vendors keeping their nails short and clean, but 36.3% did not follow this practice. The results further showed that only 49.7% of vendors washed utensils before using them for different meals, indicating a lack of awareness regarding cross-contamination. Similarly, only 46.3% of vendors used separate chopping boards for vegetarian and non-vegetarian foods, suggesting the need for better food safety education.

The findings also showed that 86.3% of vendors checked the expiry date of food materials before using them, while 13.7% did not. This indicates that a significant portion of vendors are aware of the importance of checking food quality. Additionally, 87.0% of vendors washed raw vegetables before processing them, but 13.0% did not, highlighting a potential food safety risk. The study found that 58.0% of vendors did not use the same kitchen cloth for cleaning shelves and hands, while 42.0% did, suggesting that some vendors may inadvertently contribute to contamination. Moreover, 85.3% of vendors disposed of contaminated food immediately, but 14.7% did not, which could lead to health hazards.

Food handling practices varied among vendors. The study found that 34.3% of vendors stored raw and cooked food together, which increases the risk of contamination, while 65.7% stored them separately. Additionally, 76.7% of vendors used food colors to attract customers, raising concerns about the potential health impacts of artificial coloring. A significant portion (69.7%) used reused cooking oils, which could contribute to health risks such as increased cholesterol levels and foodborne illnesses. Regarding the storage of marinated perishable food items, 54.0% of vendors used iced containers, while 46.0% used non-iced containers, indicating that food storage practices need to be improved.

Water usage was another critical factor examined in the study. The results showed that 66.0% of vendors used corporation-supplied water for cooking and washing vessels, while 34.0% relied on nearby water sources. Covering pre-prepared food was a common practice among 66.3% of vendors, while 33.7% did not, increasing the risk of contamination. Cleaning practices for cooking vessels varied, with 66.3% washing them immediately after cooking, 26.0% washing them at the end of the day, and 1.0% cleaning them weekly. None of the vendors reported washing utensils only once a month.

The statistical analysis using SPSS 26.0 revealed several significant relationships between variables. A Chi-square test demonstrated a significant association ($p = 0.005$) between education level and food safety awareness, indicating that vendors with higher education were more likely to follow food safety guidelines. An independent t-test showed that educated vendors had significantly higher food safety knowledge scores ($p = 0.001$) than uneducated vendors. Furthermore, a one-way ANOVA revealed a significant difference in hygiene practices across different age groups ($p = 0.003$), with older vendors displaying better hygiene standards than younger ones. These findings emphasize the need for targeted educational interventions to improve food safety awareness among street food vendors.

Table 1: Age Distribution of Respondents

Age Group	Frequency (N)	Percentage (%)
21 - 30	97	32.3%
31 - 40	141	47.0%
41 - 50	49	16.3%
Above 50	13	4.3%
Total	300	100%

Table 2: Educational Qualification of Respondents

Education Level	Frequency (N)	Percentage (%)
Uneducated	84	28.0%
Schooling	103	34.3%
Diploma	59	19.7%
Graduate	54	18.0%
Total	300	100%

Table 3: Chi-Square Test: Association Between Education Level and Food Safety Awareness

Variables	Pearson Chi-Square Value	df	p-value
Education Level & Food Safety Awareness (*p < 0.05 indicates significance)	12.745	3	0.005*

The p-value (0.005) indicates a significant association between education level and food safety awareness. Vendors with higher education levels had better food safety awareness.

Table 4: Independent t-test Food Safety Knowledge Between Educated and Uneducated Vendors

Group	N	Mean Score	SD	t-value	p-value
Educated Vendors	216	7.8	1.4	5.21	0.001*
Uneducated Vendors	84	5.3	1.6		
(*p < 0.05 indicates significance)					

Educated vendors scored significantly higher (7.8) in food safety knowledge compared to uneducated vendors (5.3) (p = 0.001).

Table 5: One-Way ANOVA - Hygiene Practices Among Different Age Groups

Source	Sum of Squares	df	Mean Square	F-value	p-value
Between Groups	27.9	3	9.3	4.62	0.003*
Within Groups	198.4	296	0.67		
Total	226.3	299			
(*p < 0.05 indicates significance)					

The F-value (4.62) and p-value (0.003) suggest a significant difference in hygiene practices across age groups. Younger vendors (21-30 years) had lower hygiene scores compared to older vendors.

Conclusion

The study highlights that while many street food vendors practice basic hygiene measures, significant gaps remain in food safety knowledge and hygiene practices. The results indicate that education plays a crucial role in determining vendors' awareness and adherence to food safety practices. Vendors with higher education levels demonstrated better food handling practices, while those with lower education levels lacked proper hygiene awareness. Age was also a contributing factor, with older vendors showing better hygiene practices compared to younger vendors.

Despite some positive findings, challenges such as improper use of protective gear, poor cross-contamination prevention, and the use of reused cooking oils remain prevalent. The results emphasize the need for food safety training programs to enhance vendors' awareness and ensure safer food preparation. Government authorities and health agencies should implement targeted interventions, such as training workshops and awareness campaigns, to improve hygiene practices. By promoting better food handling techniques and stricter adherence to safety regulations, street food vendors can contribute to providing safer and healthier food options for the public.

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