

# Strengthening Urban Food Security through Enhanced Food Safety Practices in West Bengal

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BACKGROUND

Street food vending is essential to West Bengal's urban food supply and economy, yet food safety remains a critical issue, as unsafe practices risk foodborne illness and nutritional insecurity. This study examines food safety and nutrition security among street food vendors, focusing on hygiene practices to support public health.

Collaborating with FOSTAC and local health authorities, the research underscores the need for improved food safety standards to protect community health.

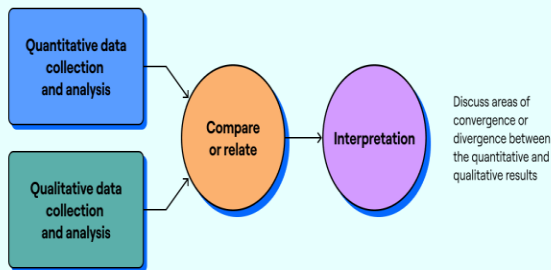
OBJECTIVES

- Evaluate food safety practices by assessing food handling and hygiene among street food vendors to identify knowledge and practice gaps.
- Understand challenges and training needs by documenting the difficulties vendors face in maintaining food safety and determining their specific training requirements.
- Provide insights for public health improvement by offering guidance for interventions aimed at enhancing food safety and public health in urban West Bengal.

METHODS

A mixed-method approach was used to assess food safety practices among 201 street food vendors in West Bengal, divided into FOSTAC-trained (80), Aspiring (71), Untrained (50), and Catering groups. Quantitative data were collected through structured surveys on demographics, hygiene practices, and compliance, while qualitative observations focused on real practices, particularly in the Catering group. Behavior Change Communication (BCC) workshops and demonstrations were conducted. Data were analyzed using descriptive statistics and ANOVA (SPSS) for quantitative data, and thematic analysis in Atlas.ti for qualitative data. The integration of findings combined both data types to address the study's objectives.

Fig 1 Study Framework



RESULT & DISCUSSION

Quantitative Exploration

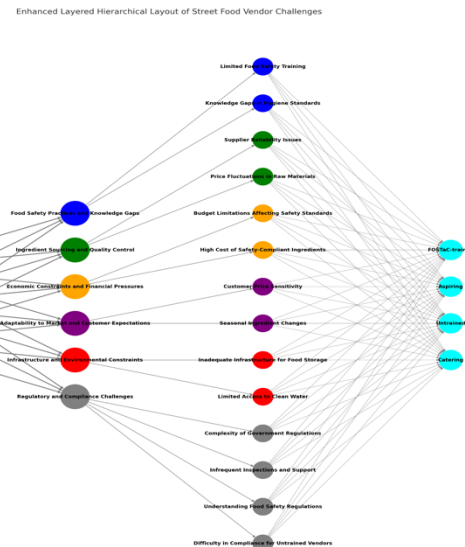
Fig 2 Comparative Demographic Profile of Street Food Vendors in West Bengal by Training Status: FOSTAC-Trained, Aspiring, and Untrained Groups



The demographic analysis (Fig 2) shows that untrained vendor groups are largely older males, while trained groups are primarily female. General caste vendors dominate trained groups, with SC and OBC more prevalent in untrained groups. All untrained vendors are Hindu, whereas trained groups have some Muslim representation. Most vendors are married, especially in the untrained group. Higher education levels are common in trained groups, while untrained groups have more basic literacy. Lower-income vendors and those with over five years of experience are mostly found in the untrained group.

Quantitative Exploration

Fig 4 Thematic Network Analysis of Challenges Faced by Street Food Vendors in Food Safety and Compliance



The network diagram (fig 4) demonstrates the interconnectedness of various themes and sub-themes impacting food safety practices among street vendors. Each layer from challenges to vendor categories is depicted, showing the influence of factors such as financial constraints, supplier reliability, and regulatory compliance.

Figure 3: Comparative Analysis of Food Safety Practices, Challenges, and Public Health Insights Across Vendor Groups

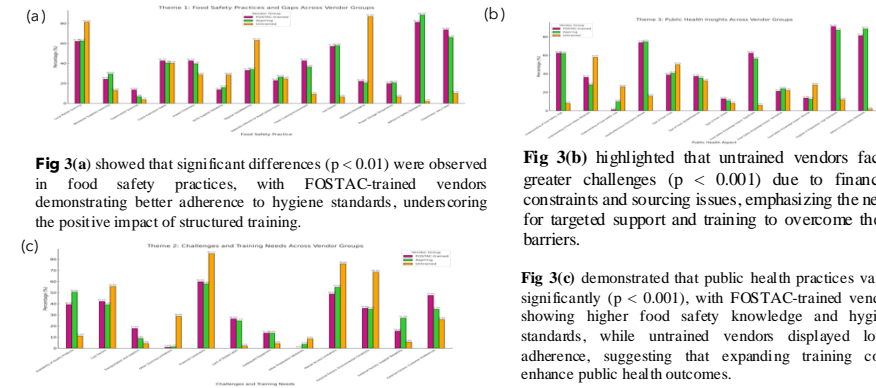


Fig 3(a) showed that significant differences ( $p < 0.01$ ) were observed in food safety practices, with FOSTAC-trained vendors demonstrating better adherence to hygiene standards, underscoring the positive impact of structured training.

Fig 3(b) highlighted that untrained vendors faced greater challenges ( $p < 0.001$ ) due to financial constraints and sourcing issues, emphasizing the need for targeted support and training to overcome these barriers.

Fig 3(c) demonstrated that public health practices varied significantly ( $p < 0.001$ ), with FOSTAC-trained vendors showing higher food safety knowledge and hygiene standards, while untrained vendors displayed lower adherence, suggesting that expanding training could enhance public health outcomes.

Integrated Quantitative and Qualitative Findings

Table 1: Integrated Quantitative and Qualitative Findings on Food Safety Themes

Theme	Focus Group	Quantitative Score of Compliance Phase	Qualitative Key Findings	Qualitative Insight
Food Safety Practices and Gaps	FOSTAC-trained	4.5	85% adherence to regular handwashing and hygiene practices.	High adherence due to structured training; regularly follow hygiene practices like handwashing and safe sourcing.
	Aspiring	3	40% follow basic hygiene practices, though gaps exist in food safety adherence.	Moderate adherence with limited resources; hygiene practices are observed but require further training.
	Untrained	2	Only 30% report consistent hygiene practices; financial and knowledge limitations hinder adherence.	Low adherence due to financial constraints and a knowledge gap; hygiene practices are inconsistent.
Challenges and Training Needs	Catering	4	60% report stable access to quality ingredients due to established supplier relationships.	Good adherence to sourcing but impacted by customer demands; balance cost with quality sourcing.
	FOSTAC-trained	3.5	78% report stable access to quality ingredients due to established supplier relationships.	Effective quality control due to training and established relationships with suppliers maintaining ingredient quality.
	Aspiring	2.5	50% face issues accessing high-quality ingredients, often compromising on quality.	Financial limitations restrict access to high-quality ingredients, compromising on quality control.
Public Health Improvement	Untrained	1.5	Only 20% have reliable access to quality ingredients, with reliance on low-cost options due to budget constraints.	Severe challenges in obtaining quality ingredients due to cost constraints; reliance on low-cost options.
	Catering	3	90% maintain high safety standards that align with public health objectives.	Maintains quality control but impacted by price fluctuations and supplier reliability.
	FOSTAC-trained	4.5	95% maintain high safety standards that align with public health objectives.	Strong financial planning and training support as high-quality practices aligning with public health goals.
Public Health Improvement	Aspiring	3	55% follow safe practices but face budget constraints impacting ingredient quality and portion control.	Struggles with portion control and ingredient quality; leans towards higher cost with effective choices.
	Untrained	2	Only 25% meet basic safety standards; financial and knowledge limitations pose risks to public health.	Limited planning skills and inconsistent safety practices due to budget constraints, posing risks to public health.
	Catering	4	80% adhere to safety standards, demonstrating a strong commitment to public health.	Prioritizes safe food practices within budget limits but occasionally influenced by customer demands and expectations.

The integration table 1 combines quantitative and qualitative data, highlighting key challenges faced by vendor groups. FOSTAC-trained vendors showed high adherence to food safety, while untrained vendors struggled with financial and knowledge limitations. Aspiring vendors performed moderately, indicating the need for targeted interventions. Overall, the findings stress the importance of training and financial support to improve food safety compliance.

Significance and Application

Training programs like FOSTAC play a crucial role in enhancing food safety practices among street food vendors, improving hygiene standards and food safety knowledge. Addressing challenges like financial constraints and sourcing limitations, especially for untrained vendors, is essential for long-term public health and food security improvements. Targeted interventions and community engagement are key to ensuring safer food practices.