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# Determinants of personal hygiene behavior amongst food handlers in fast food restaurants in South Jakarta, Indonesia

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## Abstract

**Purpose:** This study aimed to analyze the association between hygiene and sanitation facilities, food handler knowledge, health checks, and uniform conditions with personal hygiene behavior among food handlers in fast food restaurants in South Jakarta. **Methods:** A cross-sectional study was conducted using secondary data from 102 fast food restaurants inspected by the South Jakarta Health Office in 2021. Variables were constructed from standardized environmental health inspection forms. Chi-square tests and logistic regression were used to analyze the relationships between variables. **Results:** The majority (93.1%) of food handlers exhibited good personal hygiene behavior. Multivariate analysis revealed that the quantity and quality of handwashing facilities (adjOR: 6.64; 95% CI: 1.14–38.74) and the condition of work uniforms (adjOR: 8.48; 95% CI: 1.43–50.12) were significantly associated with personal hygiene behavior. Other variables, such as knowledge and health checks, showed no significant association despite low implementation rates. **Conclusion:** Ensuring the availability of proper handwashing facilities and appropriate work uniforms can significantly improve food handlers' hygiene behavior, thereby reducing the risk of foodborne illnesses. These findings underline the importance of infrastructure, routine inspections, and hygiene monitoring in fast food settings as part of a broader public health strategy to enhance food safety.

**Keywords:** fast food restaurant; food handlers; food safety; personal hygiene; public health; sanitation

## INTRODUCTION

Food is a basic human need that must be safe and free from contamination to prevent illness. Despite its nutritional content and appealing appearance, food contaminated by biological, chemical, or physical hazards becomes unsafe for consumption [1]. Foodborne diseases, such as diarrhea and parasitic infections, remain a major global public health concern, causing high morbidity and mortality. The World Health Organization (WHO) estimates that foodborne illnesses affect 600 million people and result in 420,000 deaths annually, with the majority occurring in Africa and Asia [2,3].

In Indonesia, foodborne illness prevalence is reported at 7%, with a Case Fatality Rate (CFR) of 0.4% [4]. Most outbreaks are caused by food poisoning, with a fluctuating but concerning trend over the years [5,6]. Jakarta ranks among the top provinces with the highest food poisoning cases, many of which originate from fast food restaurants due to poor hygiene practices, a lack of food safety knowledge and improper food hand-

-ling methods [7–10]. Despite the public's perception that fast food is hygienic, the WHO has noted an increase in cases of foodborne illness linked to these establishments [11,12].

Fast food consumption in Indonesia is high, and the rapid growth of fast food outlets—especially in urban areas like South Jakarta—presents both economic opportunity and public health challenges [13,14]. Many of these restaurants fail to meet hygiene and sanitation standards, risking food contamination and public health safety [15,16]. Government regulations, such as the Ministry of Health Regulation No. 1098/2003, have been established to monitor food hygiene, but enforcement remains inconsistent [6,17].

Maintaining personal hygiene among food handlers is crucial for preventing foodborne disease transmission. Facilities such as handwashing stations, protective clothing, and regular health checks, along with proper food safety knowledge, are essential [18–20]. However, previous studies have mainly focused on knowledge and attitudes, with limited evidence on the actual environmental conditions that support hygiene behavior. This study aims to address that gap by examining how hygiene infrastructure and institutional practices affect personal hygiene behavior among food handlers in fast-food restaurants. Unlike previous research, this study integrates observational data and logistic modeling to identify key determinants of hygiene behavior, offering evidence-based insights for improving food safety interventions in urban food service settings.

## METHODS

This study employed a cross-sectional design using secondary data obtained from the Jakarta Province Health Office. Administratively, Jakarta comprises five cities—South Jakarta, North Jakarta, West Jakarta, East Jakarta, and Central Jakarta—and one district, Kepulauan Seribu. For this study, data were drawn explicitly from South Jakarta. South Jakarta is one of five cities within the Jakarta Province. The area of South Jakarta is 141.37 square kilometers, accounting for 21.29% of Jakarta Province's total area. The population in South Jakarta is 1,191,213 people, with a population density of 16,865.17 persons per square kilometer [18]. South Jakarta became the most popular center of civilization in Jakarta. This area offers various conveniences, such as shopping centers, children's recreation centers, and open spaces. With the growth of South Jakarta as an increasingly popular city, there is potential for the number of fast-food restaurants to increase in this area. Therefore, the sanitary hygiene conditions of fast-food restaurants are important to draw attention to.

In 2021, the South Jakarta Health Office recorded a total of 2,662 restaurants. Of these, 253 restaurants had undergone environmental health inspections conducted by environmental health officers. The inspections were conducted using a standardized inspection form in accordance with Ministry of Health Regulation No. 1098 of 2003. This form included both structured questions and items for direct observation, all of which the inspector had to complete. Out of the 253 inspected restaurants, only 102 had fully completed inspection forms and were therefore included in the analysis.

The independent variables (quantity and quality of clean water, quantity and quality of handwashing facilities, availability of waste bins, knowledge of food handlers, health checks for food handlers, and conditions of work uniforms) and the dependent variable (personal hygiene behavior) were constructed based on some inspected items. This study assessed several variables related to restaurant sanitation and hygiene, each consisting of specific items with assigned scores. The total score for each variable was calculated by multiplying the item scores by a weight. Variables included clean water, handwashing facilities, waste bins, food handler knowledge, health checks, work uniforms, and personal hygiene behavior. Each had a different maximum score, ranging from 20 to 70. If a restaurant reached the maximum score for a variable, it was categorized as "good"; otherwise, it was labeled "not good."

Data were then analyzed using SPSS with Chi-Square and logistic regression tests to determine variables associated with the personal hygiene behavior of food handlers. The study has been reviewed by the Research and Ethics Committee of the Faculty of Public Health, Universitas Indonesia (letter number: Ket-119/UN2.F10.D11/PPM.00.02/2022).

## RESULTS

Table 1 provides an overview of the distribution of hygiene-related conditions and behaviors among fast food restaurants in South Jakarta. The data suggest that most establishments demonstrated strong compliance in areas such as personal hygiene behavior, handwashing facilities, waste management, and uniform standards. However, knowledge of food safety and the implementation of routine health checks among food handlers remained notably limited, indicating potential areas for targeted public health interventions.

Table 2 presents the bivariate analysis of the relationship between each independent variable and personal hygiene behavior. The study identified significant associations with handwashing facility adequacy and the condition of work uniforms, both of which were linked to better hygiene practices among food handlers. Other variables, including access to clean water, waste bin availability, food safety knowledge, and health checks, showed no statistically significant associations, highlighting the dominant role of infrastructure and attire in influencing hygiene behavior.

Table 3 summarizes the multivariate logistic regression model, which confirmed that handwashing facilities and work uniform conditions remained significantly associated with personal hygiene behavior after adjusting for other variables. These findings underscore the importance of accessible sanitation infrastructure and proper attire in shaping food handlers' practices, reinforcing the need for focused improvements in these areas to enhance food safety outcomes in fast food settings.

**Table 1. Hygiene practices and facility conditions among food handlers in South Jakarta (n=102)**

| Variable | Good | | Not good | |
|---|---|---|---|---|
| | n | % | n | % |
| Personal hygiene behavior | 95 | 93.1 | 7 | 6.9 |
| Quantity and quality of clean water | 80 | 78.4 | 22 | 21.6 |
| Quantity and quality of handwashing facilities | 89 | 87.3 | 13 | 12.7 |
| Availability of waste bins | 93 | 91.2 | 9 | 8.8 |
| Knowledge of food handlers | 29 | 28.4 | 73 | 71.6 |
| Health checks for food handlers | 4 | 3.9 | 98 | 96.1 |
| Conditions of work uniform | 91 | 89.2 | 11 | 10.8 |

**Table 3. Multivariate analysis**

| Variable | p-value | $_{adj}$OR | 95% CI |
|---|---|---|---|
| Quantity and quality of handwashing facilities | 0.04 | 6.64 | 1.14 – 38.74 |
| Condition of work uniforms | 0.02 | 8.48 | 1.43 – 50.12 |

**Table 2. Bivariate analysis of hygiene-related factors and personal hygiene behavior among food handlers**

| | Personal hygiene behavior | | | | Total | OR | 95% CI | p-value |
|---|---|---|---|---|---|---|---|---|
| | Good | | Not good | | | | | |
| | n | % | n | % | | | | |
| Quantity and quality of clean water | | | | | | | | |
| Good | 76 | 74.5 | 4 | 3.9 | 80 | 3.00 | 0.62-14.55 | 0.17 |
| Not good | 19 | 18.6 | 3 | 2.9 | 22 | | | |
| Quantity and quality of handwashing facilities | | | | | | | | |
| Good | 85 | 83.3 | 4 | 3.9 | 89 | 6.38 | 1.24-32.67 | 0.04 |
| Not good | 10 | 9.8 | 3 | 2.9 | 13 | | | |
| Availability of waste bins | | | | | | | | |
| Good | 86 | 84.3 | 7 | 6.9 | 93 | 0.93 | 0.87-0.98 | 1.00 |
| Not good | 9 | 8.8 | 0 | 0 | 9 | | | |
| Knowledge of food handlers | | | | | | | | |
| Good | 27 | 26.5 | 2 | 2.0 | 29 | 0.99 | 0.18-5.43 | 1.00 |
| Not good | 68 | 66.7 | 5 | 4.9 | 73 | | | |
| Health checks on food handlers | | | | | | | | |
| Good | 4 | 3.9 | 0 | 0 | 4 | 1.08 | 1.02-1.14 | 1.00 |
| Not good | 91 | 89.2 | 7 | 6.9 | 98 | | | |
| Conditions of work uniforms | | | | | | | | |
| Good | 87 | 85.3 | 4 | 3.9 | 91 | 8.16 | 1.55-43.02 | 0.03 |
| Not good | 8 | 7.8 | 3 | 2.9 | 11 | | | |

## DISCUSSION

This study found that the availability of adequate handwashing facilities and proper work uniforms had a significant influence on personal hygiene behavior among food handlers in fast-food restaurants. Handwashing facilities that meet regulatory standards—such as separate stations, running water, soap, and appropriate placement—play a key role in enabling hygienic practices [19,20]. When accessible and functional, these facilities promote frequent handwashing, which is essential in preventing the spread of pathogens during food preparation [21].

Similarly, proper work attire serves as a protective barrier, reducing the risk of contamination from external sources. Uniforms that are clean, designated for work, and complete contribute to better food safety

outcomes [22]. These findings align with earlier studies that emphasize the importance of uniforms and physical cleanliness in minimizing food contamination [23].

Although the variables related to clean water, food safety knowledge, waste bin availability, and health checks were not statistically significant, their implementation remains essential. Inadequate clean water can hinder personal hygiene and food preparation processes, and poor waste management can create an unsanitary environment [6,17]. Low knowledge and lack of regular health checks among food handlers—despite not showing a strong association statistically—are still risk factors that require public health attention through ongoing training and health monitoring programs [16,24].

These results are consistent with previous studies in Indonesia and other countries, which reported that infrastructure and hygiene enforcement are more influential than knowledge alone in shaping safe food handling behavior [25–27]. Comprehensive food safety measures must integrate facility improvements with behavior-focused interventions to effectively reduce the burden of foodborne diseases.

The personal hygiene of food handlers plays a crucial role in preventing foodborne diseases. Poor personal hygiene among food handlers poses a significant public health risk, as it can potentially contaminate food and lead to foodborne illnesses. Good personal hygiene practices, such as thorough handwashing and wearing clean clothes, are crucial for preventing the spread of pathogens and protecting consumers. To preserve consumer confidence in the food safety system and create a sound regulatory foundation, assessing the degree of food hygiene practice is critical. Improving modifiable risk factors, such as food handler training, attitude, and awareness among food handlers, plays a role in decreasing foodborne illness [28].

The findings of this study highlight critical public health implications regarding food safety in urban settings. The significant association between the availability of adequate handwashing facilities and proper work uniforms with personal hygiene behavior of food handlers demonstrates that improvements in basic infrastructure and enforcement of hygiene standards can substantially reduce the risk of foodborne illnesses. Although some variables such as knowledge and health checks did not show statistical significance, their low implementation rates suggest a need for sustained public health interventions, including education, periodic training, and routine medical screening. Strengthening regulatory oversight and expanding inspections in fast-food establishments are essential strategies to prevent disease outbreaks, protect consumer health, and promote a safer food environment. These measures not only enhance food handler practices but also reinforce the broader public health goal of reducing morbidity and mortality related to foodborne diseases in densely populated urban areas.

## CONCLUSION

This study highlights that the availability of adequate handwashing facilities and proper work uniforms are key determinants of personal hygiene behavior among food handlers in fast food restaurants in South Jakarta. While other factors such as clean water, waste management, knowledge, and health checks, did not show statistically significant associations, their implementation remains critical to overall food safety practices. Ensuring proper infrastructure and hygiene protocols can help minimize the risk of foodborne illness and improve public health outcomes in urban food service settings.

To improve food safety, the South Jakarta Health Office should strengthen routine inspections, especially for restaurants that fail to meet hygiene standards. Targeted training programs on food hygiene should be provided to food handlers, including refreshers for those already in service. Additionally, policies that mandate regular health checks and enforce uniform standards should be implemented and monitored consistently. These combined efforts will support a safer food environment and reduce the risk of foodborne disease transmission in high-density urban areas.

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