Exploring the Relationship Between Food Safety Practices, Sanitation Practices, and Customer Satisfaction in Nasi Kandar Restaurants in Penang, Malaysia

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ARTICLE INFO	ABSTRACT
Article history: Received 12 January 2025 Received in revised form 6 February 2025 Accepted 27 February 2025 Available online 15 March 2025 *Keywords:* Food safety practices; sanitation practices; customer satisfaction; hygiene standards; nasi kandar restaurants	Foodborne illnesses remain a global concern, with lapses in restaurant hygiene posing significant public health risks. In Malaysia, recent closures of prominent nasi kandar establishments due to severe hygiene violations have underscored food safety and sanitation inadequacies. This study, however, brings a ray of hope as it examines the impact of food safety and sanitation practices on customer satisfaction in nasi kandar restaurants in Penang, Malaysia. A quantitative research design was employed, using a structured questionnaire to gather data from 188 respondents through convenience sampling. The survey measured customers' perceptions of food safety practices, sanitation measures, and overall satisfaction. Data were analysed using SPSS to explore correlations between the variables. The findings reveal strong positive relationships between food safety practices ($r = 0.993$, $p < 0.01$), sanitation practices ($r = 0.984$, $p < 0.01$), and customer satisfaction. Key determinants include visible cleanliness, proper food handling, and adherence to hygiene protocols, which significantly influence customer trust and dining experiences. However, challenges persist in pest control and consistent regulatory compliance. This study emphasises the critical role of robust hygiene and sanitation standards in enhancing customer satisfaction and sustaining Malaysia's cultural and economic importance of nasi kandar restaurants. The findings offer actionable insights for restaurant operators and policymakers to foster a safer and more reliable dining culture by addressing operational challenges and aligning practices with consumer expectations.

1. Introduction

Each year, foodborne illnesses affect millions of individuals worldwide, with lapses in restaurant hygiene being a major contributing factor. In September 2024, Penang, Malaysia, witnessed the closure of several iconic nasi kandar restaurants due to severe hygiene violations, including rodent

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droppings, cockroach infestations, and unsanitary food handling practices [1-3]. These incidents rose to national attention, tarnishing the reputations of such culturally important establishments and simultaneously bringing to light fundamental shortcomings in existing food safety and sanitation management. The closure of these establishments, which are significant contributors to the local economy due to hygiene violations, underscores the severe implications for public health, consumer confidence, and business sustainability [4,5].

The hygiene standards of nasi kandar restaurants, emblematic of Malaysian cuisine, have thus become a national concern. These establishments draw local patrons and international visitors, making their upkeep vital to Malaysia's reputation as a global food destination. Media reports of hygiene lapses have prompted scrutiny of the adequacy of regulatory frameworks to ensure consistent and thorough inspections [1-3]. While Malaysia's Food Hygiene Regulations 2009 offer clear guidelines for restaurants, the recurrent violations highlight an urgent need for more effective hygiene practices to protect public health and preserve the standing of this cherished culinary tradition [6].

Food safety and sanitation are the cornerstones of operational excellence in the hospitality industry. Research highlights that personnel hygiene, proper food handling, and adequate storage play critical roles in ensuring food safety, directly influencing customer satisfaction and loyalty [7,8]. Certifications like ISO 22000 and Hazard Analysis and Critical Control Points (HACCP) have emerged as global benchmarks, enhanced operational efficiency and fostered consumer trust [9,10]. However, implementing these systems in casual dining establishments, where more resources and consistent staff training often impede uniform compliance, can take time and effort. For instance, the cost of training staff, the need for regular audits, and the difficulty in maintaining high standards during peak hours are some of the specific challenges faced in these settings [11].

Equally critical are sanitation practices, including maintaining spotless restrooms, eradicating pests, and creating welcoming dining environments. The hygiene of their surroundings significantly impacts customers' perceptions of food quality. When customers encounter pests or unclean surfaces, these negative experiences discourage repeat visits, harm the establishment's reputation, and threaten its financial sustainability [12]. This issue is particularly pertinent in Malaysia, where culinary tourism is a key economic driver. As customer hygiene awareness has increased, especially post-pandemic, visible safety measures and sanitation protocols have become critical in shaping dining preferences and behaviours [13,14].

Existing studies have extensively explored food safety and hygiene practices across various restaurant types [15-19]. Research on street food vendors, fast-food chains, and healthy dining establishments underscores the diverse challenges and priorities within the industry [15,16]. For instance, while street food settings emphasise affordability and emotional value [17], fast-food outlets prioritise operational efficiency [18], and healthy restaurants focus on sustainability and aesthetics [19]. However, a notable gap exists in understanding how food safety and sanitation practices impact customer satisfaction in culturally significant dining spaces like nasi kandar restaurants.

This research addresses this gap by analysing the relationship between food safety practices, sanitation measures, and customer satisfaction in nasi kandar restaurants in Penang. It investigates the effects of personnel hygiene, food handling, and facility maintenance on customers' perceptions and experiences. By incorporating insights from global best practices and contextualising them within local dining traditions, this study seeks to offer actionable recommendations for restaurant operators and policymakers. The findings are expected to improve hygiene standards, restore consumer trust, and enhance the overall dining experience in Malaysia's iconic culinary establishments. The research will bridge the gap between regulatory frameworks and operational realities by providing practical

strategies and guidelines to implement in these establishments, fostering a safer and more reliable dining culture that supports Malaysia's vibrant restaurant industry's sustainability and cherished culinary traditions.

2. Literature Review

2.1 Hygiene and Sanitation Issues in Malaysian Nasi Kandar Restaurants

Hygiene and sanitation issues in Malaysian nasi kandar restaurants have become a growing concern, particularly due to frequent reports of regulatory breaches. These restaurants, known for their cultural significance and flavourful cuisine, have faced scrutiny for lapses such as pest infestations, improper waste management, and unclean facilities. Recent closures of prominent nasi kandar establishments in Penang highlighted systemic hygiene violations, including rodent droppings and cockroach infestations, which raised questions about the industry's compliance with food safety standards [1-3].

Lapses such as these are not unique to nasi kandar establishments but reflect broader issues in Malaysia's food service sector. Previous research highlighted that inadequate knowledge and training among food handlers are central to poor hygiene practices in catering services [20]. Similarly, the lack of uniform enforcement of regulations creates opportunities for noncompliance [21]. Visible lapses, such as unclean restrooms and dining areas, significantly influence customers' decisions to patronize these iconic establishments [13].

These hygiene concerns extend beyond merely provoking customer dissatisfaction and significantly affect public health and the prospects of culinary tourism. While the Malaysian Food Hygiene Regulations 2009 provides a legal framework, there is an urgent need to strengthen monitoring and penalties for noncompliance [6]. These challenges are imperative in the survival of nasi kandar restaurants, the preservation of our culinary heritage, and providing excellent preoccupations for both nasi kandar visitors and clients [22].

2.2 Customer Satisfaction in Nasi Kandar Restaurants

In the restaurant industry, customer satisfaction is a critical variable affecting customer loyalty, word-of-mouth referrals, and repeat visits [23]. In Penang's nasi kandar restaurants, the service quality, hygiene standards, operational efficiency and convenience contribute positively or negatively to customer satisfaction. Research shows that customers find cleanliness, prompt services, convenience, and a pleasant dining environment, which together contribute to the perception of the restaurant [5,8,24].

Links between food safety certifications, such as HACCP and ISO 22000, and increased customer satisfaction have been well established, as these systems provide a structured approach to ensuring food quality and safety [10,21]. Similarly, sanitation practices, such as maintaining clean restrooms and pest-free dining areas, significantly influence customer perceptions. Previous findings highlight that cleanliness in shared spaces is critical in shaping the overall customer experience [12].

Furthermore, implementing hygiene training for food handlers is crucial for maintaining high service standards by equipping staff with the necessary skills and knowledge [4]. To address these challenges, nasi kandar establishments can focus on continuous staff development, strict adherence to safety regulations, and improving customer convenience. These strategies align with prior findings and can help nasi kandar restaurants sustain their cultural and economic importance in Malaysia's food service sector.

2.3 Food Safety Practices and Customer Satisfaction

Operational excellence is essential to the hospitality industry, and food safety practices are vital components of it. These practices include almost all the activities, such as personnel hygiene, food handling, cooking techniques and storing practices to control the contamination risks and ensure food safety [25]. Failure of effective food safety management means potential risk to public health but entails no less than loss of customer satisfaction and loyalty. Indeed, in several studies, customers consistently prioritise selecting dining places for clean and safe dining [5,8].

The role of certifications such as HACCP (Hazard Analysis and Critical Control Points) and ISO 22000 has been widely recognized in ensuring food safety compliance [9,10]. These frameworks provide systematic approaches to identifying and managing food safety risks, thereby enhancing operational reliability and consumer confidence [10,26]. The significance of HACCP training for food service staff lies in its ability to reduce contamination risks and improve overall food quality [9].

In casual dining settings, visible adherence to food safety practices strongly influences customer perceptions. Diners are more likely to feel satisfied when they observe restaurant staff adhering to hygiene standards, such as wearing clean uniforms, using proper utensils, and maintaining sanitary service areas [5]. Conversely, lapses in practices like improper food handling or the presence of pests can lead to negative customer experiences and erode trust [13]. The hypothesis is as follows:

Hypothesis 1:
A significant positive relationship exists between food safety practices and customer satisfaction in nasi kandar restaurants.

2.4 Sanitation Practices and Customer Satisfaction

Sanitation practices are vital to the restaurant customer experience, encompassing clean restrooms, dining areas, kitchen spaces, pest control, and waste management. These practices not only ensure a clean facility but also create a healthy working environment for employees, reflecting the restaurant's commitment to their well-being [12,14]. Moreover, they serve as proxies for food quality and safety, significantly influencing customer perceptions and the likelihood of repeat visits.

The importance of sanitation training for food handlers cannot be overstated. Well-trained staff are not only better equipped to maintain cleanliness and adhere to safety standards, but they also feel more empowered and capable in their roles [11]. Effective sanitation practices, such as regularly cleaning restrooms and dining areas, have also significantly enhanced customer satisfaction, particularly in speciality food shops [8]. Similarly, sanitation measures are particularly crucial in street food settings, where customers often base their dining decisions on visible cleanliness cues [4].

In Malaysia, recurring hygiene violations in nasi kandar restaurants underscore the need for stricter sanitation standards enforcement. Lapses, such as unclean restrooms or pests, not only deter customers and harm the establishment's reputation but also erode the trust that customers have in the restaurant [20,21]. Maintaining high sanitation standards is, therefore, not just about customer satisfaction, but also about fostering trust and loyalty. Thus, the hypothesis is as follows:

Hypothesis 2:
A significant positive relationship exists between sanitation practices and customer satisfaction in nasi kandar restaurants.

3. Methodology

3.1 Research Design

This study adopted a quantitative research design to investigate the relationship between food safety practices (independent variable), sanitation practices (independent variable), and customer satisfaction (dependent variable) in nasi kandar restaurants in the Bukit Jambul area of Penang. A survey approach was employed to collect measurable data on customers' perceptions and experiences, aligning with the previous framework [5].

3.2 Sampling Technique

Convenience sampling was utilised to recruit participants among patrons dining at nasi kandar restaurants in the Bukit Jambul area. The sample size was determined using G*Power Analysis, based on a medium effect size (0.3), a significance level (α) of 0.05, and a statistical power (1−β) of 0.80. The analysis recommended a minimum of 85 respondents. To ensure data reliability, researchers increased the target sample size to 188 respondents to account for non-responses and incomplete data, ensuring robust and meaningful results.

To address potential biases, efforts were made to minimise selection bias by sampling diverse customer groups and assuring anonymity to reduce response bias. While this method limits generalizability, it provided valuable insights into food safety practices, sanitation, and customer satisfaction. Limitations and biases were explicitly acknowledged to ensure greater methodological clarity.

3.3 Instrument

The questionnaire was divided into three sections. The first section focused on demographics, gathering information such as age, gender, frequency of visits, and dining preferences. The second section assessed independent variables. These included food safety practices, evaluation of food handling, personnel hygiene, adherence to safety protocols, sanitation practices, and addressing restroom cleanliness, pest control, and the overall dining environment. The final section evaluated the dependent variable, Customer Satisfaction, using a 5-point Likert scale to measure perceptions of food safety, sanitation, and overall satisfaction with the dining experience.

3.4 Data Collection

Data were collected using a structured questionnaire distributed via Google Forms to customers who had dined at nasi kandar restaurants in the Bukit Jambul area within the past month. The questionnaire focused on assessing Food Safety Practices, Sanitation Practices, and Customer Satisfaction. Convenience sampling was utilized for its practicality and accessibility, resulting in 188 successful responses. This approach ensured efficient data collection from a relevant target group that was aligned with the study's objectives.

3.5 Pilot Study

The pilot study was conducted to evaluate the reliability of the survey constructs—Food Safety Practices, Sanitation Practices, and Customer Satisfaction. Table 1 presents the reliability statistics, with Cronbach's alpha values for all constructs exceeding 0.98, indicating excellent internal

consistency. These results confirm that the survey instrument is reliable and appropriate for the main study [27].

The pilot test involved 30 respondents, selected using convenience sampling due to its practicality and accessibility. A sample size of at least 30 is sufficient for pilot studies to provide initial reliability testing and identify any issues with the survey instrument [28]. Convenience sampling was employed as it allows for quick data collection and aligns with the exploratory nature of pilot studies [29].

Table 1
Pilot test - reliability analysis

Construct	Cronbach's Alpha	Number of Items (N)
Food safety practices	0.981	10
Sanitation practices	0.982	10
Customer satisfaction	0.982	5

3.6 Data Analysis

Data analysis was conducted using SPSS version 29. Descriptive statistics were used to summarise respondents' demographic data and overall responses. Correlation analysis examined the strength and direction of relationships between food safety practices, sanitation practices, and customer satisfaction.

3.7 Ethical Considerations

Participation in the study was voluntary, and respondents provided informed consent before completing the survey. All responses were anonymised to protect participant confidentiality, and data were used solely for research purposes by ethical research standards in the hospitality field.

4. Results
4.1 Descriptive Statistics of Demographic Profile

Table 2 presents the demographic characteristics of respondents. The gender distribution is pretty even, with males slightly dominating (52.1%). Most respondents are 31–40 (43.6%), followed by 21–30 (38.8%). The majority are employed (54.8%), with students (24.5%) and self-employed individuals (16.0%) comprising significant proportions. Retired and unemployed groups are minimal.

Table 2
Demographic characteristics of respondents

Variable	Category	N	%
Gender	Female	90	47.9
	Male	98	52.1
Age	Below 20 years	30	16.0
	21–30 years	73	38.8
	31–40 years	82	43.6
	Above 40 years	3	1.6
Occupation	Student	46	24.5
	Employed	103	54.8
	Self-employed	30	16.0
	Retired	2	1.1
	Unemployed	7	3.7

4.2 Descriptive Statistics of Respondents' Behaviour

Table 3 shows that weekly visits (34.6%) and 2–3 times a month (27.7%) are the most common, while less frequent visits (22.9%) and more than once a week (14.9%) are less common, indicating a preference for moderate dining frequency.

Table 3
Frequency of visits to nasi kandar restaurants

Variable	Category	N	%
Frequency of visits to nasi kandar restaurants	Once a month or less	43	22.9
	2–3 times a month	52	27.7
	Weekly	65	34.6
	More than once a week	28	14.9

Table 4 highlights the reasons for dining at nasi kandar restaurants. Family gatherings are the most common reason (42.6%), followed by business meetings (27.7%) and personal enjoyment (16.5%). A smaller proportion (13.3%) dines for other reasons, showing the prominence of social and professional purposes.

Table 4
Reason for dining

Variable	Category	N	%
Reason for dining	Personal enjoyment	31	16.5
	Family gatherings	80	42.6
	Business meetings	52	27.7
	Other	25	13.3

4.3 Descriptive Analysis of Study's Scales

Table 5 presents ranked descriptive statistics for food safety practices. The highest-rated item ensures that food is cooked and served at appropriate temperatures (M = 3.90, SD = 1.47). Items covering food, using proper utensils, and maintaining hygiene share similar mean scores (M = 3.80, SD = 1.43). Lower-rated items include cleaning storage areas (M = 3.61, SD = 1.19) and discarding leftovers appropriately (M = 3.74, SD = 1.28). The data highlights positive practices, with room for improvement in pest control and cleaning areas.

Table 5
Ranked descriptive statistics for food safety practices

Rank	Item	Mean	Standard deviation
1	Food is cooked and served at appropriate temperatures	3.90	1.47
2	All prepared food is covered and protected from contamination	3.80	1.43
	Food is handled using proper utensils to avoid direct contact	3.80	1.43
	Food handlers maintain proper personal hygiene, such as clean hands	3.80	1.43
5	Food handlers avoid wearing jewellery or accessories while preparing food	3.77	1.29
6	Leftover food is discarded appropriately and not reused	3.74	1.28
7	Handwashing facilities for food handlers are readily available	3.72	1.26
	Food handlers wear clean and appropriate uniforms	3.72	1.26
	Smoking is strictly prohibited in food preparation and serving areas	3.72	1.38
10	Food storage areas are clean and well-maintained	3.61	1.19

Table 6 summarises ranked descriptive statistics for sanitation practices. The highest-rated practice is regularly emptying trash bins in dining and kitchen areas (M = 3.85, SD = 1.34). Adequate dining area ventilation and clean, functional handwashing facilities follow closely (M = 3.72, SD = 1.26). Lower-rated practices include implementing proper pest control measures (M = 3.45, SD = 1.19) and sanitising kitchen and food preparation areas (M = 3.56, SD = 1.28). The results suggest a general emphasis on visible cleanliness, with opportunities to improve pest control and sanitation standards.

Table 6
Ranked descriptive statistics for sanitation practices

Rank	Item	Mean	Standard deviation
1	Trash bins in dining and kitchen areas are emptied regularly	3.85	1.34
2	Ventilation in the dining area is adequate to maintain a comfortable atmosphere	3.72	1.26
	Handwashing facilities for customers are clean and functional	3.72	1.26
	Restrooms are regularly cleaned and adequately stocked with essentials	3.72	1.38
5	All cleaning equipment (e.g., mops, cloths) is adequately stored and maintained	3.69	1.37
	The restaurant exterior, including parking areas and entryways, is clean	3.69	1.37
	The walls, floors, and ceilings of the restaurant are visibly clean	3.69	1.37
8	Dining tables and chairs are cleaned immediately after use by customers	3.64	1.21
9	The kitchen and food preparation areas are sanitised regularly	3.56	1.28
10	Proper pest control measures are implemented (e.g., no cockroaches)	3.45	1.19

Table 7 displays ranked descriptive statistics for customer satisfaction. The cleanliness of the restaurant, which enhances the dining experience, is rated the highest (M = 3.96, SD = 1.38), followed by hygiene practices that meet expectations (M = 3.85, SD = 1.34). Overall cleanliness and maintenance (M = 3.77, SD = 1.29) rank third. The restaurant's ability to meet expectations for a safe and hygienic dining environment (M = 3.72, SD = 1.38) and confidence in food safety standards (M = 3.66, SD = 1.35) are rated lower. The results highlight the importance of visible cleanliness for customer satisfaction.

Table 7
Ranked Descriptive Statistics for Customer Satisfaction

Rank	Item	Mean	Standard deviation
1	The cleanliness of the restaurant enhances my dining experience	3.96	1.38
2	The hygiene practices of food handlers meet my expectations	3.85	1.34
3	I am satisfied with the overall cleanliness and maintenance of the restaurant	3.77	1.29
4	The restaurant meets my expectations for a safe and hygienic dining environment	3.72	1.38
5	I feel confident in the food safety standards of this restaurant	3.66	1.35

4.4 Hypotheses Testing

Table 8 presents the correlation analysis between food safety practices and customer satisfaction in nasi kandar restaurants. The Pearson correlation coefficient indicates a solid positive relationship (r = .993, p < .01) between the two variables. This suggests that as food safety practices improve, customer satisfaction increases significantly. The significance value (p < .01) confirms that the

relationship is statistically significant at the 99% confidence level, providing strong evidence to reject the null hypothesis. Additionally, the covariance values (1.597 for food safety practices and 1.605 for customer satisfaction) and the robust sample size (N = 188) further support the reliability of the findings. These results validate Hypothesis 1, establishing that food safety practices are critical drivers of customer satisfaction in nasi kandar restaurants.

Table 8
Correlation between food safety practices and customer satisfaction

Variable	Food safety practices	Customer satisfaction
Food safety practices	1	.993**
Customer satisfaction	.993**	1
Sum of Squares and Cross-products	298.638	300.061
Covariance	1.597	1.605
N	188	188

*Note. * Pearson correlation coefficients are reported. **p < .01 (1-tailed).

Table 9 presents the correlation analysis between sanitation practices and customer satisfaction in nasi kandar restaurants. The Pearson correlation coefficient indicates a strong positive relationship (r = .984, p < .01) between the two variables. This result implies that improved sanitation practices significantly enhance customer satisfaction. The significance value (p < .01) confirms that the relationship is statistically significant at the 99% confidence level, providing evidence to reject the null hypothesis. The covariance values (1.508 for sanitation practices and 1.545 for customer satisfaction) and a robust sample size (N = 188) further validate the reliability of the analysis. These findings support Hypothesis 2, establishing that sanitation practices are critical to customer satisfaction in nasi kandar restaurants.

Table 9
Correlation between sanitation practices and customer satisfaction

Variable	Sanitation practices	Customer satisfaction
Sanitation practices	1	.984**
Customer satisfaction	.984**	1
Sum of Squares and Cross-products	281.932	288.842
Covariance	1.508	1.545
N	188	188

*Note. * Pearson correlation coefficients are reported. **p < .01 (1-tailed).

5. Discussion

This study explores the significant connection between food safety practices, sanitation measures, and customer satisfaction in nasi kandar restaurants. The findings reveal strong positive correlations between food safety (r = .993, p < .01) and sanitation practices (r = .984, p < .01) with customer satisfaction, emphasizing the importance of these elements in shaping dining experiences. These results align with prior research that highlights hygiene and sanitation as key drivers of customer satisfaction in the foodservice industry [12,21].

The findings of this study show a strong correlation (r = .993) between effective food safety practices and high customer satisfaction. Customers highly value visible and consistent food safety efforts, such as proper food handling and maintaining hygiene standards, which build trust and improve their dining experience. These results are consistent with previous findings, highlighting that customers respond positively to measures ensuring food is cooked and stored safely [8]. Similarly, the importance of structured frameworks like HACCP in managing risks and maintaining consistent

quality has been emphasized in earlier studies [9]. Additionally, the adoption of systematic approaches like the PDCA (Plan-Do-Check-Act) framework has been shown to help identify root causes of noncompliance and improve adherence to food safety plans [30].

The correlation between sanitation practices and customer satisfaction (r = .984) was also strong. Visible cleanliness, such as maintaining clean restrooms and trash disposal areas, significantly influences how customers perceive the professionalism of operations. These findings are consistent with previous research, which emphasizes the importance of perceived cleanliness in fostering customer loyalty [13]. However, challenges in hygiene practices persist, particularly in adhering to pest control regulatory standards. Earlier studies noted similar challenges, highlighting the reputational risks associated with inadequate compliance [22].

In summary, the results reveal the intricate relationship between food safety, sanitation, and customer satisfaction. While visible efforts dominate customer perceptions, addressing less apparent hygiene measures remains critical for sustaining public trust and regulatory compliance.

6. Conclusions

This study's results offer a detailed examination of food safety practices, sanitation measures, and customer satisfaction in nasi kandar restaurants. Examining these interrelated processes enables an understanding of the influence of hygiene practices on operational success and customer perceptions. The findings reveal that preserving cleanliness and hygiene practices is essential for establishing confidence, attracting customer loyalty, and maintaining the reputation of these cultural hubs.

Challenges of regulatory enforcement and operational adherence are shown in the study as well, in the case of less visible issues, such as pest control. Such findings underscore the need to pay more attention to systemic issues constraining consistent adherence to hygiene standards. Nasi kandar restaurants are a highly differentiated space in Malaysia's culinary heritage and the tourism industry. Therefore, its importance cannot be overstated to individual businesses, and maintaining high food safety and sanitation standards overall makes Malaysia a global food hub.

The study provides a detailed view of how hygiene practices impact the dining experience and restaurant sustainability. It connects customer insights with operational realities and presents the findings in the broader Malaysian context. However, the research also highlights the global relevance of the findings, drawing attention to local regulatory frameworks and reflecting on challenges common to the global hospitality industry. The study concludes that hygiene and safety are imperative, preserving the dignity of the food services industry by ensuring that establishments are safe, hygienic, and resilient for centuries to come.

6.1 Limitations

This study has several limitations. First, the use of convenience sampling limits the generalizability of the findings to a broader population, as the sample is specific to patrons of nasi kandar restaurants in the Bukit Jambul area. Second, the reliance on self-reported data introduces the potential for response bias, as participants may exaggerate positive or negative experiences. Additionally, this research adopts a cross-sectional design, which captures customer perceptions at a single point in time, making it difficult to establish causality between food safety, sanitation practices, and customer satisfaction.

6.2 Recommendations for Future Research

Future research could investigate the causal relationships between sanitation practices and customer satisfaction using longitudinal studies or experimental designs. The findings from these studies could have practical implications for the hospitality industry. Longitudinal studies allow researchers to track changes in customer perceptions over time in response to sustained hygiene improvements. Experimental designs could isolate and measure the impact of specific sanitation practices, such as visible cleanliness and pest control, on customer satisfaction and loyalty.

Furthermore, future studies could broaden the scope by inclusively including various types of restaurants, such as fast-food outlets or fine-dining establishments, and examining regions beyond Penang. This comprehensive approach ensures that all aspects of the hospitality industry are considered, incorporating the perspectives of restaurant staff and management to enrich an understanding of operational challenges and compliance strategies.

Acknowledgement

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