Public Health of Indonesia
E-ISSN: 2477-1570 | P-ISSN: 2528-1542

Original Research

Factors associated with Food Safety Practices (FSP) among visitors in the Depok Beach Area in Yogyakarta, Indonesia

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DOI: https://doi.org/10.36685/phi.v9i3.707
Received: 24 June 2023 | Revised: 5 August 2023 | Accepted: 1 September 2023

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Abstract

Background: The availability of safe, healthy, and clean food in tourism places is essential to ensure customers' satisfaction. Most previous studies focused on food safety practices among food handlers. However, personal food safety practices are needed to prevent foodborne diseases.

Objective: This study aimed to identify the factors associated with food safety practices among people who visited Depok Beach.

Methods: A quantitative approach was done on 211 Depok Beach visitors selected by the accidental sample method. This study was conducted from September to October 2022. Descriptive statistics, chi-square, and binary logistic regression were used for data analysis.

Results: This study found that factors such as marital status, knowledge, and attitude were 2.8, 1.2, and 2.2 times, respectively, more likely to practice poor food safety practices.

Conclusion: The food safety practice among visitors was less than average. The factors associated with food safety practices among visitors were marital status, knowledge, and attitude about food safety. Health promotion about food safety for customers is needed. Further studies could mix with the qualitative approach to get comprehensive findings.

Keywords: food safety; customers; visitors; Depok Beach; Indonesia

Background

Global health remains a threat due to infections and diseases because of food contamination. Poor food safety practices have many impacts, including food poisoning and foodborne diseases. Poor food safety is still a cause of food poisoning worldwide (Fung et al., 2018). Incredible incidents of food poisoning occur in various countries such as Italy (Guidi et al., 2018), India (Khare et al., 2018), Argentina (Manfredi & Rivas, 2019), Ethiopia (Kassahun & Wongiel, 2019), Japan (Suzuki et al., 2020), France (Velut et al., 2019), and Korea (Lee et al., 2020) to cause severe pain and death. It is estimated that 600 million people fall ill annually from contaminated food, resulting in 420,000 deaths worldwide and 170,000 in the Southeast Asian region (WHO, 2020). Food contamination is caused by various environmental factors such as toxic metals,

chemicals, pesticides, veterinary drugs, natural poisons of food, and some that are contaminated during cooking (Agneta, 2012). Therefore, food safety management is critical to preventing foodborne illness (Kamboj et al., 2020).

The tourism area is the destination area where most of the tourists visit. The availability of safe food in public places is essential to ensure customers' satisfaction regarding healthy, clean, and safe food. Moreover, food quality, cleanliness, and price are the things that visitors consider when visiting tourist attractions (Wiatrowski et al., 2021). The tiered role of the government to the local community in maintaining food safety in their place of residence (tourism area) needs to be taken seriously (Fakfare & Wattanacharoensil, 2021). Therefore, it is imperative to have location-based food safety planning, policies, and strategies in a tourism destination (Lee et al., 2019).

The excellent implementation of food safety is not only the responsibility of food handlers. As mentioned in a previous study, food handlers play the most important role in determining safe and healthy food for consumers (Kwol et al., 2020). The part of food handlers in tourist attractions greatly determines the food quality that will be produced, affecting the food safety for tourists (Hastuti et al., 2022). Therefore, implementing food safety practices will be optimal given the appropriate management culture and adequate resources (Suryani & Rustiawan, 2022).

However, the role of customers is also essential. This is because food safety practices consist of some practices that customers can do. Some of those points include paying attention to the expiration date, reading the label before purchase, using a clean hand before eating, and washing eggs before cooking. The importance of food safety practices among customers is interesting because most of the study only focused on food safety practices among food handlers.

During the COVID-19 pandemic from late 2019 to early 2023, the tourism sector experienced a significant decline. This is due to prevention regulations with PSBB (Pembatasan Sosial Berskala Besar), the application of protocols to prevent transmission in public places, and the limiting or closing of certain tourist attractions to prevent transmission of the COVID-19 virus between humans. This research was conducted during the COVID-19 pandemic and was carried out at the tourist spot Depok Beach in Yogyakarta. This well-known tourist spot has become a destination for national and international tourists when visiting the Special Region of Yogyakarta Province. The high coverage of the COVID-19 vaccination nationally and the reduced application of regulations to prevent COVID-19 in the community have made Depok Beach tourism increasingly crowded with tourists daily. Although visitors still come from local and national residents, food safety practices among tourists in the Depok Beach area must have good standards for food handlers and customers.

Globally, previous studies found up to 20% of diarrhea among travelers, mostly due to poor hygiene and food safety (Steffen et al., 2015). Acute diarrhea is common during travel, especially in low-middle-income countries, including Indonesia. Based on a study in Bali, Indonesia, *E.Coli* was found positively in restaurants with not good hygiene food handlers (Purnama & Subrata, 2020). The same research in Bali found that hand-washing behavior significantly correlates to traveler's diarrhea (Ani & Suwiyoga, 2016).

Implementing hygiene and safe food in all tourist areas is essential to prevent traveler's diarrhea. However, there is a lack of studies conducted on tourism in Yogyakarta. Moreover, among all the beaches in Yogyakarta, Depok Beach is one famous beach that local and global tourists visit. The implementation of food safety management is needed for both food handlers and consumers. Furthermore, this study aimed to examine the factors influencing food safety practices among tourists in the Depok Beach tourism area, Yogyakarta, Indonesia.

Methods

Study Design

A cross-sectional study design was used in this study to examine the influence of socio-demographic, knowledge, and attitude factors on the food safety practices of tourists in Depok Beach, Kretek Sub-district, Bantul District, Yogyakarta, which is one of the famous beaches with various culinary tourism.

Samples/Participants

The study was conducted from September to October 2022. The population of this study were all visitors to Depok Beach during the data collection. The sample was determined randomly using an accidental sampling technique on the most visited day by tourists (respondents). The willingness of tourists to be included as respondents determines the number of samples. So, until the last day of data collection, the number of samples in this study was 211 respondents.

Instrument

The questionnaire used in this study comprised 18 questions developed based on previous studies (Farahat et al., 2015; Hassan & Dimassi, 2014; Odeyemi et al., 2019; Sani & Siow, 2014; Stratev et al., 2017; Zhang et al., 2015). The questionnaire was translated into Bahasa Indonesia by the Ahmad Dahlan Language Center (ADLC). It consists of several question items, including sociodemographic characteristics, criteria for respondents choosing where to eat, food safety knowledge, food safety attitudes, and food safety practices.

The sociodemographic questionnaire includes age, gender, education, marital status, occupation, and area of origin. The food safety knowledge questionnaire has 18 questions, using a 2-1 Guttman scale with “true” and “false” answers. The practice safety attitude questionnaire has 15 questions, using a 4-1 Likert scale with the answers “Strongly Agree”, “Agree”, “Disagree”, and “Strongly Disagree”. Furthermore, the food safety practice questionnaire has 15 questions, using a 3-1 Likert scale with the answers “Always”, “Sometimes”, and “Never”.

The questionnaire is reliable and has been validated through initial testing of 30 respondents at the Baru Bantul beach tour area. The tests were carried out for food safety knowledge questionnaires, food safety attitudes, and food safety practices, which then obtained Cronbach alpha values of 0.83, 0.86, and 0.76, respectively.

Data Collection

Data were collected every weekend (Saturday and Sunday) face-to-face for one month in the entire Depok Beach area. The researcher was assisted by two enumerators whose perceptions had been equalized beforehand. Researchers and enumerators collected data on tourists who voluntarily be able for being respondents and filled out informed consent. Questionnaires were distributed to be filled in by respondents while still being accompanied by researchers or enumerators. The researcher and enumerator then rechecked the completed questionnaire to ensure the completeness of the filling.

Data Analysis

This study used three stages of analysis, starting with univariate analysis to describe the characteristics of the subject, then bivariate analysis with the Chi-Square test was done to identify the relationship between each variable with a 95% CI ($\alpha = 0.05$). Next, a binary logistic regression test was used to determine the most influential variables with the direction and magnitude after adjusting to all other independent variables. All data analysis was performed using SPSS Version 25 software.

Ethical Considerations

Each respondent signed informed consent prior to data collection. Ethical Approval for this study was obtained from the Ahmad Dahlan University Yogyakarta ethics committee office (Certificate of Approval No. 012208112). The entire research process carried out the standard protocol for preventing the transmission of COVID-19 from the Indonesian Ministry of Health Indonesia.

Results

Table 1 describes the general information about the study’s samples. Among 211 respondents, the majority of them were of adult age (89.57%). More than half were female (65.88%), and almost all had a low educational level (95.26%). About half of the respondents were unmarried (56.40%) and came from Central Java Province (47.87%). Regarding working status, most of them were working (89.57%), considering the cleaning factor for choosing the restaurant (50.71%). According to KAP (Knowledge Attitude Practice) about food safety, more than half of them had poor knowledge (54.03%), poor attitude (57.82%), and good practice (57.35%), respectively.

Table 1 Characteristics of respondents

Variables (n = 211)	Frequency	Percentage
Age		
Adolescent	22	10.43
Adult	189	89.57
Sex		
Female	139	65.88
Male	72	34.12
Level of education		
High	10	4.74
Low	201	95.26
Marital status		
Unmarried	119	56.40
Married	92	43.60
Area of origin		
Yogyakarta	59	27.96
Central Java	101	47.87
West and East of Java	30	14.22
Outside of java	21	9.95
Working status		
Working	189	89.57
Not working	22	10.43
The reason for choosing the restaurant		
Food taste	59	27.96
Food display	6	2.84
Price	31	14.69
Clean environment	107	50.71
Others	8	3.79
Level of knowledge		
Good	97	45.97
Poor	114	54.03
Level of attitude		
Good	89	42.18
Poor	122	57.82
Food safety practice		
Poor	90	42.65
Good	121	57.35

The result of the bivariate analysis, which has been done using the simple logistic regression test, is shown in **Table 2**. It showed that some variables correlate with food safety practices while others do not. The variables significantly associated with food safety practices were age, sex, marital status, knowledge level, and attitude. However, other variables, including education level and working status, found no association with food safety practices.

The binary logistic regression was done to examine the correlation of each independent variable by adjusting to other predictors. The result revealed that marital status, level of knowledge, and level of attitude were found to be significantly associated with food safety practices. In detail, after adjusting to other independent variables, marital status significantly correlates with food safety practice. Those who were unmarried were 2.8 times more likely to practice poor food safety practices than married ones. According to the level of knowledge and attitude, it was found those who had poor knowledge and attitude had odds 1.2 and 2.2 times more likely to practice poor food safety compared to good ones after adjusting with other independent variables. However, other variables, including age, sex, level of education, and working status, were not significantly associated with food safety practices (**Table 3**).

Table 2 Bivariate analysis of food safety practice among respondents

Independent variables	N	Food safety practice		COR (95% CI)	p-value
		Good	Poor		
Age					
Adult	189	133	76	2.602 (1.04-6.50)	**0.041**
Adolescent	22	8	14		
Sex					
Female	139	87	52	1.870 (1.05-3.33)	**0.033**
Male	72	34	38		
Level of education					
High	201	115	86	0.891 (0.24-3.26)	0.862
Low	10	6	4		
Marital status					
Married	92	67	25	3.226 (1.80-5.79)	**0.000**
Unmarried	119	54	65		
Working status					
Working	22	14	8	1.341 (0.53-3.35)	0.530
Not working	189	107	82		
Level of knowledge					
Good	114	70	44	1.435 (0.83-2.48)	**0.015**
Poor	97	51	46		
Level of attitude					
Good	122	80	42	2.230 (1.27-3.90)	**0.005**
Poor	89	41	48		

Table 3 Binary logistic regression analysis of poor food safety practices among respondents

Independent variables	Adj. OR	95% Confidence Interval		p-value
		Lower	Upper	
Age (ref. Adult)				
Adolescent	1.777	0.651	4.851	0.262
Sex (ref. female)				
Male	1.369	0.735	2.548	0.322
Level of education (ref. High)				
Low	0.849	0.190	3.807	0.831
Marital status (ref. Married)				
Unmarried	2.779	1.473	5.241	**0.002**
Working status (ref. Working)				
Not working	1.087	0.402	2.943	0.869
Level of knowledge (ref. Good)				
Poor	1.227	0.667	2.256	**0.031**
Level of attitude (ref. Good)				
Poor	2.190	1.187	4.042	**0.012**

Discussion

According to the findings of this study, it was found that the prevalence of visitors who had poor food safety practices was about half. The factors associated with food safety practices were marital status, knowledge, and attitude toward food safety practices. However, other factors are not significantly associated with food safety practices, such as age, sex, level of education, and working status. This study's findings align with the previous study comparing food safety knowledge, attitude, and practice in Cameroon and Iran (Odeyemi et al., 2019). The different results from the study in North Jakarta found a correlation between knowledge and attitude toward food safety practices (Putri & Susanna, 2021). Among the food handlers, the results of this study were not in line with the study in Tobago; it was found that education level, knowledge, and working status have a correlation with food safety practices WEBB. The study in Haiti brought out the customers and food handlers at the

same time. The findings of that study revealed that the knowledge and attitude between them were average, and factors such as gender, training, and education level did not correlate with food safety knowledge (Samapundo et al., 2015). Different from the result of this study, the study among Lebanese students found that gender, living with parents, and knowledge level correlated with food safety practices (Hassan & Dimassi, 2014).

In terms of the outcome of poor food safety practices, there is a direct impact on health, commonly called foodborne diseases. One study in the Capital City of Jakarta found that food safety and hygiene were associated with diarrhea among children under two years old (Agustina et al., 2013). The importance of food safety concerns was found to have a correlation with eating choices based on the study among students in Ghana (Adam et al., 2014). Furthermore, food safety, food fraud, and food defense were considered for the risk assessments (Manning & Soon, 2016).

In terms of the limited studies conducted among customers of the general population, poor food safety practices are also impacted on industrial sectors. One industrial sector mentioned in a previous study was palm oil. Awareness of customers is needed to implement food and nutrition safety in the palm oil industry (Hariyadi, 2020). Apart from that industry, there is a packaging industry that was also mentioned by the study in Indonesia that the implementation of a food safety management system (FSMS) is required (Purwanto, 2020). The tourism industry also needs more attention to food safety management, especially mentioned in a street food study in Penang, Malaysia (Mohamad et al., 2022).

Food safety practice training is also needed for food handlers and customers. The previous food safety training course developed knowledge and attitudes about food safety (Putri & Susanna, 2021). Furthermore, the concern of food safety is essential not only for food servers, food handlers, or food vendors but also for individual homes because there is always any risk of foodborne disease (Ababio & Lovatt, 2015).

This study can contribute to providing data that could improve food safety practices among visitors to prevent the spreading of communicable diseases in tourism areas. This study has limitations, such as the result could not be generalized to other tourism areas. In the local context, this study can give a clear understanding of food safety among visitors in the beach area. In the global context, this study can contribute a general description of food safety practices among local tourists so international tourists can practice more food safety, especially in tourism areas in Indonesia.

Conclusion

The factors that were found to be associated with food safety practices were marital status, knowledge, and attitude toward food safety. The strongest factor was marital status, which mentioned that unmarried ones tend to practice poor food safety. In terms of the lack of previous studies on the relationship between marital status and food safety practices, it might be assumed that having a partner will lead people to practice more appropriately, including food safety. The knowledge and attitude were also significantly associated with food safety practices, which means there is a need for more health promotion that food safety is essential for both food handlers and customers. Further study can do the mixed method to comprehensively find the factors associated with food safety practices among food handlers and customers.

Declaration Conflicting Interest

All of the authors stated no conflict of interest in this research.

Funding

This study was funded by Lembaga Penelitian dan Pengabdian Kepada Masyarakat (LPPM) Ahmad Dahlan University, Yogyakarta, Indonesia.

Acknowledgment

We appreciate all stakeholders who contributed and completely participated in this study as well as the Ahmad Dahlan University, Yogyakarta for all support throughout this study.

Author Contribution

Dr. Dyah Suryani led this research, and all the authors significantly contributed to this study according to authorship criteria.

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Cite this article as: Suryani, D., Rustiawan, A., & Jannah, A. A. (2023). Factors associated with Food Safety Practices (FSP) among visitors in the Depok Beach Area in Yogyakarta, Indonesia. *Public Health of Indonesia, 9*(3), 105-112. https://doi.org/10.36685/phi.v9i3.707