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Original Research

Food Handlers Hygiene of Balinese Traditional Food in Tourism Destination at Badung Regency

Ni Putu Ayu Wulan Noviyanti[1*], Putu Ratna Suprima Dewi[1], & Ni Putu Eka Febianingsih[1]

[1]*Sekolah Tinggi Ilmu Kesehatan Kesdam IX/Udayana, Denpasar, Indonesia*

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Abstract

Introduction: Food safety is the domain of public health problems which can be seen from the incidence of foodborne diseases that often occur in developing countries. Personal hygiene can prevent the occurrence of foodborne diseases and cross contamination. This study aims to describe the food handlers hygiene while processing Balinese traditional food.
Methods: Observational research with cross-sectional design. Respondents in this study are 90 food handlers in Badung Regency, obtained by purposive sampling. Descriptive statistical analysis and Chi-Square test was used in data analysis.
Results: 20% food handler had good practice in personal hygiene while processing traditional food. Less than 100% food handlers wash their hands before and after cooking, wash their hands with soap, sneeze not facing food, and keep their nails clean and not long. 22,2% food handlers use hair nets while processing food. 100% of food handlers are in good health and use clean clothes when processing food. There are differences in personal hygiene behaviour based on education level (p=0,042).
Conclusion: Traditional Balinese food handlers have low personal hygiene. Monitoring is needed to improve the hygiene of food handlers in the production processes. Analytical observational research is essential to understand the factors that influence food handler hygiene.

*Corresponding Author:
e-mail: wulann98@gmail.com

INTRODUCTION

The incidence of diarrhea in foreign tourists visiting Bali is 25.5%, from May to August 2013 [1]. One of the risk factors for diarrhea in travelers who come to Bali is consuming Balinese traditional food such as lawar, pork satay, and traditional barbecued pork [2]. Traditional food is made by mixing ingredients that are traditionally used and developed in the region [3]. Food safety is the domain of public health problems which can be seen from the incidence of foodborne diseases that often occur in developing countries. Extraordinary events originating from food not only infect the local community but also involve domestic and foreign tourists visiting Bali. One of the causes of foodborne diseases is bacteria such as E. coli, salmonella, and campylobacter [4]. Hands are one of media for transmitting diseases caused by bacteria [4]. To prevent transmission from hands, good personal hygiene is very important to prevent transmission of pathogens from food handlers to consumers. Good knowledge and implementation related to personal hygiene can prevent the occurrence of foodborne diseases and cross contamination [5].

Research conducted in Gianyar and Kuta showed that traditional Balinese foods such as *lawar* after being tested microbiologically depend on pathogenic bacteria such as E. coli [6, 7]. The presence of pathogenic bacterial contamination in food is caused by poor hygiene of food handlers and poor sanitation facilities [6, 7]. Personal hygiene that needs to be considered when processing food is cutting nails, washing hands with soap, and using head coverings [6], [8]. In addition to personal hygiene, sanitation facilities and environmental hygiene affect the microbiological quality of food [6]. There are many places to eat Balinese traditional food in Badung Regency and very accessible. Lawar is one of Balinese traditional food they are interested in [7]. Meanwhile, based on previous research, it was stated that traditional Balinese food such as lawar contains biological contaminants [6], [7]. The aim of this study was to describe personal hygiene of food handlers while processing Balinese traditional food.

METHODS

This study is an observational study using a cross-sectional design which was conducted from 1-22 September 2022 in Badung Regency. Respondents are food handlers processing Balinese traditional food. This research used purposive sampling with the criteria of food handlers who process Balinese traditional food such as *lawar*, pork satay, suckling pork, chicken with Balinese seasoning (*ayam betutu*), and Balinese traditional mix vegetables (*sayur urab*). Obtained 90 food handlers who participated in this research survey.

The questionnaire contains sociodemographic information such as gender, age, education level and time work experience. The hygiene practice was observed by form that had been built. Based on the category, hygiene is divided into 2, namely good and poor. There are eight statements regarding hygiene such as food handler must be in good health, food handler

must dress clean, food handler wears a hair net while cooking, food handler wears footwear while cooking, wash hand before and after cooking, washing hands with soap after using toilet, when sneeze don't face the food, and nails are always clean and not long. If all statements are fulfilled (score = 8) then hygiene is good.

Univariate analysis was used in this study, such as frequency and percentage, presented in the form of tables and graphs. The Chi-Square test was conducted to determine the difference between variables related to personal hygiene of food handler. Variables that have significant differences with $p < 0.05$ on the Chi-Square test.

Ethical Consideration

This research was declared ethically worthy by the Ethics Committee of Faculty of Medicine, Udayana University, and Sanglah General Hospital, Bali (No.2043/UN14.2.2.VII.14/LT/2022). The data collected is handled with care and confidentiality is guaranteed by only allowing research to access the raw data.

RESULTS

Socio-demographic Characteristic

Table 1 shows Most respondents who participated in this study are female (72,2%). 53,3% of respondents are in the age group of ≤45 years. The education completed by the respondents is high school and higher education (61,1%). Most of the food handlers have 3 years of work experience.

Food Handlers Hygiene

There are 20% of food handlers with good personal hygiene practices. This indicates that the food handlers perform all the personal hygiene criteria set out in this study. 80% of food handlers do not apply several personal hygiene criteria such as food handler wears a hair net while cooking, food handler wears footwear while cooking, wash hand before and after cooking, washing hands with soap after using toilet, when sneeze don't face the food and nails are always clean and not long, as shown in figure 1.

After observing the hygiene of food handlers, the majority of the criteria that must be carried out by food handlers have been carried out well. 100% of food handlers are in good health and use clean clothes when processing food. With a percentage less than 100%, food handlers wash their hands before and after cooking, wash their hands with soap, sneeze not facing food, and keep their nails clean and not long. The lowest personal hygiene performed by food handlers is to use a head covering while preparing food (22,2%).

The results of the Chi-Square test showed that there were differences in personal hygiene behaviour between the education level of food handlers with p-value= 0.042. There is no difference in personal hygiene behaviour based on the characteristics of gender, age, and time work experience with p-value >0.05.

Table 1

Socio-demographic characteristics of food handler

Variables	n (%) N (90)
Sex	
Female	65 (72,2)
Male	25 (27,8)
Age	
≤45	48 (53,3)
>45	42 (46,7)
Education	
Illiterate	7 (7,8)
Primary school	17 (18,9)
Junior secondary school	11 (12,2)
Senior secondary school	38 (42,2)
College/University	17 (18,9)
Work experience	
>3 years	67 (74,4)
≤3 years	23 (25,6)

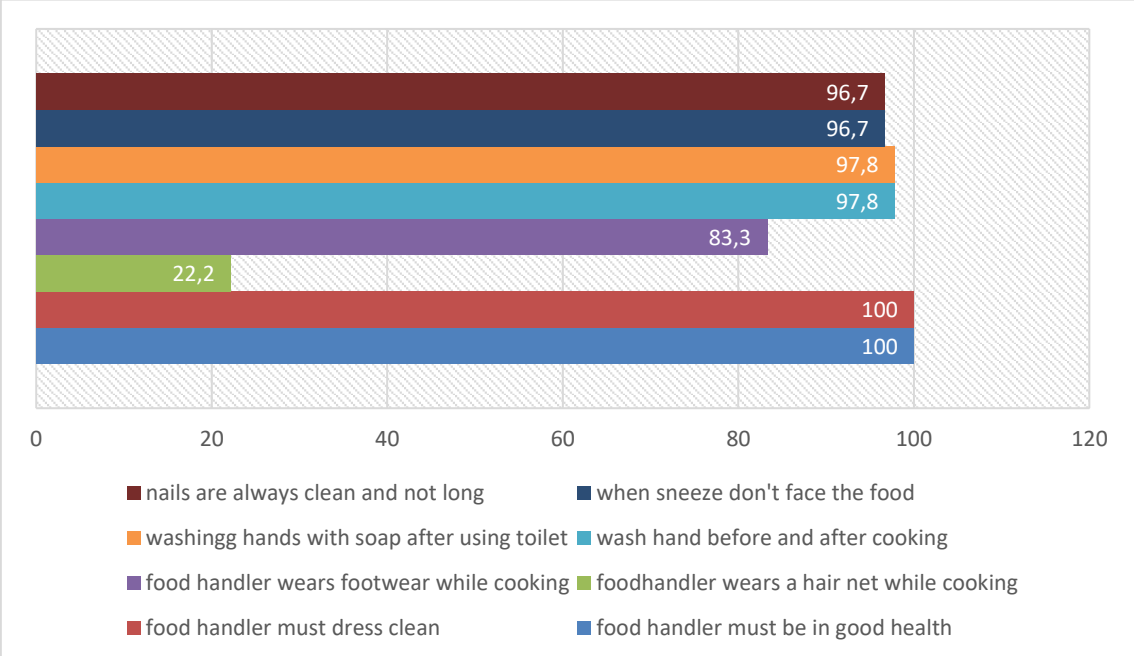

Figure 1. Hygiene practice of food handler

Table 2

Personal Hygiene of food handler based on socio-demographic characteristics

Variables	Personal Hygiene N (%)		p-value
	Good	Poor	
Sex			
Female	13 (20,0)	52 (80,0)	1,000
Male	5 (20,0)	20 (80,0)	
Age			
≤45	6 (12,5)	42 (87,5)	0,057
>45	12 (28,6)	30 (71,4)	
Education			
College/University	8 (47,1)	9 (52,9)	0,042
Senior secondary school	6 (15,8)	32 (84,2)	
Junior secondary school	1 (9,1)	10 (90,9)	
Primary school	2 (11,8)	15 (88,2)	
Illiterate	1 (14,3)	6 (85,7)	
Work experience			
>3 years	13 (19,4)	54 (80,6)	0,809
≤3 years	5 (21,7)	18 (78,3)	

DISCUSSION

Good personal hygiene is very important to prevent transmission of pathogens from food handlers to consumers [5]. This study found that level of knowledge had difference perform of personal hygiene behaviour, it is because food handlers who have a good level of knowledge have a higher chance of applying hygiene when processing food [9]. So, food handlers are expected to have basic knowledge and skills in handling food hygienically. Lack of knowledge and understanding in the application of food hygiene can be a major barrier to effective implementation of HACCP implementation in small food businesses [10].

On the other hand, there are studies that found different results, although food handlers have good knowledge related to food safety, they rarely apply the knowledge they have [11]. It was also found that knowledge gained through indirect training can change attitudes and behaviour [12]. With the knowledge and training provided to food handlers, it is recommended that owners and managers proactively support food handlers to apply the acquired knowledge into food safety handling practices by providing the necessary resources and needs to assist food handlers in implementing food safety behaviours [13]. Research conducted in Semarang showed that buying food at roadside eateries or mobile food vendors increased the risk of developing typhoid fever (OR=3.86; 95% CI 1.30±11.48) [14]. Research conducted in Jakarta at street food stalls and sellers found behaviours that increase the risk of foodborne illness, these behaviours are not washing hands before preparing food (OR = 4.20; 95% CI 1.97–8.93), touching food directly with hands (OR). =2.54; 95% CI 1.22–

5.29), male gender (OR=5.45; 95% CI 2.59–11.48) and low level of education (OR=2.35; 95% CI 1.13–4.88) [15].

The literature shows that proper hand washing is one of the most effective measures to control the spread of pathogenic bacteria in food processing, and the use of rings reduces the benefits of hand washing [16]. Hands are an effective means of transmitting diseases caused by organisms such as Salmonella, Campylobacter and Escherichia coli, which are sourced from feces, nose, skin or other surfaces to food, so washing hands with soap and running water is important [4]. Handling food with bare hands without hand gloves has a high risk of contamination by staphylococci bacteria, which can later lead to food poisoning due to staphylococci bacteria [17]. This study found that poor personal hygiene of food handlers was due to the low use of hair coverings when processing food. Similar result was found that behaviour of food handlers who are at risk of increasing the incidence of foodborne disease are not using hair coverings, not having access to good water, food providers not having cold storage areas during transportation, not washing hands and washing hands using water only [8]. It is important to use a head cover when processing food because it can prevent food from physical contaminants such as hair [18].

CONCLUSION

Traditional Balinese food handlers have low personal hygiene, especially in the use of head coverings. Analytic observational research is needed to understand the factors that influence the implementation of personal hygiene. Good commitment from the owner in providing resources to be able to apply the principles of hygiene and sanitation is important. For the health care, it can be used for designing training that fit on the characteristics of food handler and monitor the implementation of personal hygiene periodically.

CONFLICT OF INTEREST

In this research, there is no conflict of interest between any parties.

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