Knowledge, Practices and Related Factors for Food Hygiene Among Street Food Vendors in Vientiane Capital, Laos

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ABSTRACT

Hygiene standards and practices for street food vendors constitute a significant part of food hygiene in many urban areas for developing countries. Food contamination is a major cause of death and illness due to diarrhea. This study assessed the knowledge, practices and their related factors for hygiene among street food vendors in four urban districts of Vientiane Capital, Laos.

A cross-sectional study using face to face interviews and observations of 196 street food vendors in four urban areas with respect to their handling of food in the main streets, fresh markets and public places was performed. The STATA 11 program was used to analyze the data for descriptive statistics such as frequency, percentage, mean, standard deviation and minimum and maximum values to find correlations among factors using multiple logistic regressions.

Most of the street food vendors are female (81.6%) with an average age of 39.07 (±10.6 years, min 14-max 61); with 63.2% of them have stationary food stalls; 78.1% of the street food vendors perform this as their main occupation; 70.9% of the vendors are regulated and licensed by the local government. Less than 50% of the vendors showed a good level of knowledge and one-third of them stated good hygiene practices and applied environmental sanitation for pre-processing, processing and preservation. The main factors associated with a good level of practice in food hygiene were being in possession of a health certificate (AOR=0.4, 95% CI=0.2-0.7), having a desire to know about food hygiene (AOR=0.4, 95% CI=0.2-0.9), being trained in food hygiene (AOR=0.4, 95% CI=0.2-0.8), making it their main occupation (AOR=0.5, 95%

CI=0.3-0.8), being regulated and licensed by the local government (AOR=2.3, 95% CI=1.2-4.6), and having a knowledge about the causes of food contamination (AOR=2.3, 95% CI=1.1-4.6).

The study found that the knowledge and practices of vendors were at a poor level. There is a need for educational programs to improve vendors' knowledge especially to emphasize translation of theory into practice.

Keywords: Knowledge, practices, street food vendors, food hygiene

Introduction

Street vendors provide a source of inexpensive, convenient and relatively nutritious food. They are characterized into two groups: mobile vendors and stationary vendors. Mobile vendors travel from place to place with prepared and packaged food intended for sale placed on their heads or on carts, bicycles, motorcycles or tricycles. Stationary vendors have fixed stalls where food is prepared, stored and served to consumers [1]. The street food vending sector of the economy has expanded in low and middle-income countries and provides access to a diversity of inexpensive foods for a variety of customers [1]. One of the frequent problems in the sale of street foods is their actual and potential hazards caused by bacterial contamination [2]. The conditions under which street vendors operate are often undesirable for both the preparation and the sale of food [3]. They are prepared in very dirty surroundings with waste water and garbage disposed nearby, providing nutrients and breeding grounds for rodents and vermin [4]. Food-borne related illnesses have increased over the years, and negatively affected the health and economic well-being of many developing nations [5]. There is inadequate supervision and proper monitoring by food safety officers and the enforcement of food hygiene regulations is weak [6]. Food-borne diseases are an important cause of morbidity and mortality worldwide with a significant public health impact. The global burden of food- borne diseases in 2010 was 33 million healthy life years lost (DALY) with about 600 million food-borne illnesses and 420,000 deaths, of which food-borne diarrheal diseases, the most frequent cause of food-borne illnesses, contributed about 230,000 deaths [7]. A lack of training in food safety and good hygiene practices is also rife among food handlers [8]. Investigations of outbreaks of food-borne disease throughout the world show that, in nearly all instances, they are caused by the failure to observe satisfactory standards in the preparation, processing, cooking, storing or retailing of food [9]. It is recognized that vendors are often poor, uneducated and lacking in knowledge and hygienic

practices for safe food handling. Consequently, they are perceived to be a major public health risk to the community [10].

In the Lao People's Democratic Republic, it has been estimated that 11% of the under-5 mortalities is due to diarrhea. Diarrhea remains a significant disease burden and one of the leading causes of death in children under age 5 in less developed countries, where there are ongoing problems with poor nutrition and sanitation, and access to safe food and water [11].

Therefore, poor knowledge and hygienic practices and inadequate sanitary conditions play major roles in the increased burden of communicable diseases within developing countries. This study evaluated the knowledge, practices and their related factors on hygiene among vendors in four districts in the Lao capital.

Methodology

Study design

The study applied the quantitative method using a cross-sectional study to describe the knowledge, practices and related factors of vendors, as well as conducting interviews and observations of 196 vendors.

Location and study duration

This study was conducted in four urban districts in Vientiane Capital, namely Chanthabouly, Sisattanak, Sikhottabong and Saysettha districts. The duration of the study was one year, from May 2018 to June 2019, which was periodically divided for example title selection, proposal defence, data collection, analysis and interpretation of data results, write up of thesis, and final submission.

Sample size and cluster

The males and females who were willing to give their consent to participate in this study handled foods in the main streets, the fresh markets and public places in four districts. These were Sikhottabong (Kokpho, Sikhay and Nongniew markets), Sisattanak (Thongphanthong and Souanmone markets), Saysettha (Nongnieng and Houakhoua markets), and Chanthabouly (Vangthong, Thongkhankham and Houayhong markets). The sample size was 196 vendors which was calculated from previous studies [12].

Tools for study

The study used interview and observation forms which consisted of six parts and included 79 questions. Part 1: included eight socio-demographic questions, Part 2: consisted of three personal information questions, Part 3: consisted of five social environmental factors and

other factors questions; Part 4: consisted of three accessibility to food information questions, Part 5: consisted of 41 questions about the knowledge of vendors about food hygiene according to 6 groups of knowledge and Part 6: consisted of 21 questions about practices for food hygiene which were divided into two groups. Before data collection, we tested the form's reliability using the Cronbach's Alpha method with test parameters greater than 0.7.

Analysis process

Data entry was done using EpiData software. The data was transferred to STATA software version 11.0 where it was cleaned and analyzed. The descriptive statistics were analyzed and for each part of the variables data were presented as percentages, frequencies, means, standard deviations (SD), and minimum and maximum values. Regarding the analysis of the factors that were associated with hygiene practices, a logistic regression analysis was performed. The p-value < 0.05 was considered as a significant association and it was generated with a 95% confidence interval (95% CI) and adjusted OR value.

Research ethics

The study was conducted after the approval of the University of Health Sciences Ethics Committee, Ministry of Health. It was important for this study to be fair to all parties and thus it obtained the informed written consent of all the participants.The study was given Authorization Number: 3809/UHS.15, Dated September 1, 2019.

The study results

Table 1 shows the socio-demographic characteristics of the vendors in the four districts. Almost half of the respondents were over 40 years of age (with ages ranging from 14 to 61), with a mean of 39.07 ±10.6 years. Among those surveyed there were four times more women than men. In terms of education, just under half of them had completed primary school and over a third had completed junior high school and more than three quarters of the respondents had food vending as their main occupation while less than 10% and slightly over 10% were employees in the private and government sectors respectively.

Table 1: Socio-demographic and other characteristics of participants

Variables	Frequency (n=196)	Percentage (%)
Age (mean=39.07, age range 14-61, SD ±10.6)		
Age group		

≤20 years	9	4.5
21-30 years	39	19.9
31-40 years	54	27.5
>40 years	94	47.9
Sex		
Female	160	81.6
Male	36	18.3
Education level		
Illiterate	4	2.0
Primary school	93	47.4
Junior high school	65	33.1
High school	29	14.8
College, University	5	2.5
Main occupation		
Street vendor	153	78.1
Business person (factory, company, etc.)	18	9.1
Public servant (government staff)	25	12.7

Table 2 shows the annual health checkup rate with less than 50% of the respondents being tested for health while more than half were not covered by any health certification. Almost two thirds of vendors wanted to know about food hygiene, and more than two thirds of respondents had not attended basic formal training in food hygiene. Nevertheless, almost three quarters of them were regulated or licensed by the local authorities to run their businesses, and just under 60% of respondents were aware of the causes of food contamination.

Table 2: Information about food hygiene factors for participants

Variable		Frequency (n=196)	Percentage (%)
Obtained health certificate	Yes	86	43.8
	No	110	56.1
Need to know about food hygiene	Yes	123	62.7
	No	73	37.2

Have been trained in food hygiene	Yes	64	32.6
	No	132	67.3
Regulated and licensed by local	Yes	139	70.9
government	No	57	29.0
Knowledgeable about causes of food	Yes	116	59.1
contamination	No	80	40.8

Factors affecting the practices of street food vendors

Table 3 shows the independent variables correlated significantly with the dependent variables, with a p-value of <0.05. A backward stepwise was performed to determine the association between factors and practices of street food vendors. The results were presented by adjusting the odds ratio (AOR) with a corresponding confidence level of 95%. The six variables included an issued health certificate (AOR=0.4, 95CI=0.2-0.7), a need to know more about food safety (AOR=0.4, 95CI=0.2-0.9), prior experience with food hygiene training (AOR=2.3, 95CI=1.1-4.6), occupational status (AOR=0.5, 95CI=0.3-0.8), supervised and licensed by the local government (AOR=2.3, 95CI=1.2-4.6) and a knowledge about the causes of food contamination (AOR=0.4, 95CI=0.2-0.8).

Table 3: Bivariate and multivariate logistic regression analysis of the factors associated with the practices

Variables	**Practice in food hygiene**		**P-value**
	COR (95% CI)	**AOR (95% CI)**	
Multivariate analysis of factors associated with practices of personal hygiene and environmental sanitation			
Obtained health certificate			
No			
Yes	0.4 (0.2-0.8)	0.4 (0.2-0.7)	0.007**
Need to know about food hygiene			
No	1	1	
Yes	0.5 (0.2-1.0)	0.4 (0.2-0.9)	0.03**

Multivariate analysis of factors associated with practices of pre-processing, processing and preservation

Have been trained in food hygiene			
No	1	1	
Yes	1.9 (0.9-3.9)	2.3 (1.1-4.6)	0.014**
Main occupation			
Street food vendor	1	1	
Business person	0.5 (0.1-1.4)	1	
Public servant	0.2 (0.08-0.7)	0.5 (0.3-0.8)	0.018**
Regulated and licensed by local government			
No	1	1	
Yes	2.0 (1.0-4.1)	2.3 (1.2-4.6)	0.012**
Knowledge about causes of food contamination			
Poor	1	1	
Good	0.5 (0.2-1.0)	0.4 (0.2-0.8)	0.010**

*****Statistically significant odds ratios (P <0.05)

Discussion

This was the premier study on the knowledge, practices and related factors for food hygiene among street food vendors in Vientiane Capital. This study reported on the degree of knowledge regarding food hygiene as well as the contributing factors among vendors in urban Vientiane**.**

Overall, the results of this study showed that there were two factors associated with practices of personal hygiene and environmental sanitation, and four factors associated with practices of pre-processing, processing and preservation which shared a p-value of < 0.05.

The majority of vendors did not check their health annually and were lacked health certification. These factors which showed a statistically significant correlation with practices of personal hygiene and environmental sanitation (p=0.007). One of the common ways of regulating street food vendors in developing countries is through a medical examination of vendors, as mentioned in a study done in Ghana [13]. In this study, more than half of the respondents did not undergo the required medical examination. This is probably due to the lack

of awareness, a dislike of additional costs or associated inconveniences, especially when the vendors felt healthy.

For the aspects concerning hygiene training, this study found that almost a third of respondents had previously attended educational sessions pertaining to cleanliness and this had a significant association with the practice of pre-processing, processing and preserving food. It seems that training in hygiene influences sanitary practices, as affirmed by the study done in primary schools in Jos, Nigeria, in which the majority of respondents did not attend hygiene training and experienced problems with contaminated food. Similar results were gained in Malaysia, Thailand and Ethiopia, where a large number of respondents had not attended hygiene seminars [12].

With regard to the influence of occupational status, the study revealed a statistically significant relationship for food vendors. The vendors who worked in the government were associated with the practices of pre-processing, processing and preserving food. This is probably due to the fact that these vendors have easier access to food information than the street food vendors who work in private enterprises. However, variations exist according to the specific foods vendors market to particular clients from different career sectors.

Being regulated and licensed by the local government to run a business was statistically significant in its association with hygiene practices ($p<0.01$). This finding concurs with the study done in Alexandria, Egypt, in which more than two thirds had no support or documented approval from the district administrators [14].

The knowledge of street food vendors has a highly significant role in their practices for food hygiene. Such knowledge can directly or indirectly transmit values to hygiene practices. Vendors with a good knowledge would consciously try to help improve and develop the quality of their food hygiene practices. In general, practices refer to the ways in which people demonstrate their knowledge through their actions. In the present study, all of the knowledge groups for the vendors were poor in relation to hygiene practices and their compliance. However, there was a noticeable awareness of the causes of food contamination which was associated and statistically significant with practices of pre-processing, processing and preserving ($p<0.01$). This pattern is similar to other studies done in countries such as Thailand, where less than 20% of food handlers had good food hygiene practices [15]. In Bangladesh, most of the food vendors had poor knowledge and practices in food safety [16], and in Turkey, the results presented a majority of food vendors who had poor levels of understanding [17]. In contrast, a study carried

out in Nigeria showed that the street food vendors displayed a good knowledge for the maintenance of safe, healthy food [12] .

This study also has some limitations because some street food outlets were narrow, which made not easy to collect data, especially the investigator's questions and answers of food vendor were unclear and inaccurate and sometimes may barrier or interrupt food buyers during the interview.

Recommendation

This study has shown that the knowledge and practices for food hygiene among street food vendors are poor and this surprisingly is the first such study in the Lao PDR. The factors related to food hygiene practices consist of health certification, a sense of urgency to know about food sanitation, up-skills training for food hygiene, occupational dispositions, engagement with local authorities and a depth of knowledge about the causes of food poisoning. According to the findings, the following actions are suggested:

The responsible parties should take care to organize regular training programs to raise the vendors' knowledge and practical abilities when seeking to maintain food hygiene. At the same time, local authorities and relevant stakeholders should support regular monitoring and inspections to resolve issues in a timely manner, such as annual health checks of vendors or performing an inspection based on a checklist to ensure food safety. This will protect food consumers from risky food intakes and prevent food-borne illness outbreaks.

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