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Research Article

Knowledge and practices of processors about food poisoning and food-borne diseases of street food businesses in Thanh Xuan district, Hanoi city in 2024

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Abstract

Food poisoning and food-borne diseases are on the rise in developing countries and are a major threat to global health [1]. We conducted a cross-sectional descriptive study on 122 subjects with the goal of describing the knowledge and practices of food poisoning and food-borne diseases of street food businesses in Thanh District. Xuan, Hanoi. The results show that the general knowledge and practice of the main processors is still low. In which, up to 14.81% of processors are unaware of the risk factors for food poisoning. The subjects know the consequences of using unsafe foods that cause chronic diseases and genetic modification of less than 15%. Those who have the habit of washing their hands before processing Ho Chi Minh City accounted for 54.8% and after contact with cooked food accounted for 59.3%. The percentage of processors who only wash their hands with water accounts for 20% of the subjects. Thereby, management agencies need to strengthen inspection and supervision of the implementation of food safety procedures at restaurants in their management areas. Organize health examinations and training on food safety knowledge periodically.

Keywords: *Food poisoning, knowledge, practice, street food*

1. INTRODUCTION

Food poisoning (FPO) and foodborne diseases have been and are a health problem that governments and communities around the world are concerned about. Consuming spoiled, unhygienic food containing bacteria, parasites, viruses, infectious microorganisms or toxic substances is the main cause of FPO. According to the World Health Organization (WHO), each year there are about 1.5 billion cases of diarrhea in children due to eating contaminated food, leading to more than 3 million deaths [2]. According to the 2022 report, Vietnam recorded 59 cases of food poisoning, more than 1,400 people were poisoned and 28 died, mostly from collective kitchens and street food businesses [3].

Thanh Xuan District is one of the central districts of Hanoi. In April 2023, the food safety Interdisciplinary Teams inspected and supervised 227 producing, processing establishments, and trading food services and street food in the district. 23 establishments in violation were administratively fined and destroyed VND 57,200,000 in total value of goods that did not meet food safety and hygiene quality standards [4]. The fact indicated that the situation of unsafety food trading in Thanh Xuan district is still complicated and difficult to control. For the above reasons, a study was conducted to evaluate the knowledge and practices of food poisoning and foodborne diseases of street food establishments in Thanh Xuan district, Hanoi in 2024 with two objectives, firstly to describe the knowledge of food poisoning prevention and foodborne diseases of street food establishments in Thanh Xuan district and secondly to describe the practices of food poisoning prevention and foodborne diseases of street food establishments in Thanh Xuan district, Hanoi in 2024.

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2. MATERIALS AND METHODS

2.1. Objective

Main food processors of street food establishments operating in Thanh Xuan district, Hanoi city at the time of the study. The selection criteria were shop owners, stalls, food businesses and food processors working at food outlets who agreed to participate in the study. The exclusion criteria included subjects who are not able to communicate and answer research questions. Subjects who are not of working age (under 15 years old).

2.2. Research method

2.2.1. Research design

The study was designed using a cross-sectional descriptive method.

2.2.2. Sample size

Apply the sample size formula to a proportion in a population:

$$n = z^2_{(1-\frac{\alpha}{2})} \frac{p(1-p)}{(d)^2} = 1.96^2 \frac{0.644(1-0.644)}{(0.085)^2} = 122$$

In which: n: Minimum sample size required;

$z_{(1-\frac{\alpha}{2})}$: confidence coefficient level of 95%, the value is 1.96;

d: Acceptable error, selected d=0.085.

p = 0.644 (The rate of business people with knowledge about food safety according to the study of Nguyen Thi Thu Giang and colleagues in Kon Tum province in 2018) [5].

The minimum sample size calculated was 122. An additional 10% in case they refused to participate in the study resulted in a final sample size of 135.

2.2.3. Sampling method

The survey sample was selected using the simple random sampling method. First, a list of 11 administrative units at the ward level of Thanh Xuan district was made. Then, randomly selected establishments processing and trading street food in each ward. At each establishment, 1 processor was purposely selected to participate in the research interview.

2.2.4. Research variables

General information: including age, gender, education level, years in business, and training in food safety and hygiene. Describe the knowledge of food processors on food poisoning prevention: causes, risk factors, consequences, symptoms, treatment, and prevention measures. Describe practices on food poisoning prevention.

2.2.5. Information collection method

Collect interview data based on a pre-designed questionnaire, the structure was built based on previous studies related to the research topic in Vietnam. Specifically, the questionnaire is based on the study "Knowledge, attitude, practice on food poisoning of people in Hoa Mac town, Duy Tien district, Ha Nam province in 2013 and some related factors" by author Pham Thi Duyen [6].

2.2.6. Data processing and analysis methods

Daily review of information in the collected questionnaires to promptly detect and handle (collect additional survey forms) missing or incorrect information. Clean data and enter into the computer using Microsoft Excel 2010 software. Analyses are performed on STATA 14.2 software (100% of data is cleaned before analysis).

2.2.7. Research ethics

The study was conducted with the consent of the council through the thesis outline of Hanoi Medical University. The study was conducted on the basis of the voluntary participation of the research subjects, all subjects have the right to refuse to participate in the study. The subjects were clearly informed of the content and method of implementing the survey questionnaire. The information collected will only serve the purpose of research, all information of the research subjects will be kept absolutely confidential.

3. RESULTS AND DISCUSSION

3.1. General information about research participants

As shown in **Table 1**, through the study of 135 subjects, we found that the main processors of street food establishments are mostly women (60%). According to long-standing customs in our country, women are also the ones who take on the main housework in family meals. Therefore, improving knowledge and practice for research subjects not only contributes to ensuring food hygiene and safety criteria in food establishments, for people using that service, but also contributes to ensuring the health of themselves and their families. Thereby limiting the risks of food poisoning as well as food-borne diseases.

Table 1. *Personal information of research subjects*

General information		Number (n = 135)	Ratio (%)
Age	< 30 years old	20	14.8
	30 – 55 years old	83	61.5
	> 55 years old	32	23.7
Gender	Male	54	40.0
	Female	81	60.0
Education level	Primary school	5	3.7
	Secondary school	24	17.8
	High school	66	48.9
	College/ University	40	29.6
Street food business time	≤ 1 year	12	8.9
	2 – 5 years	57	42.2
	6 – 10 years	51	37.8
	> 10 years	15	11.1
Trained in food safety and hygiene	Yes	71	52.6
	No	64	47.4

The majority of the study subjects were between 30 and 55 years old (61.5%), with secondary education level and lower accounting for 21.5%, high school or higher education accounting for 78.5%. It can be seen that there has been an improvement in education among the selected subjects.

3.2. Current status of knowledge of subjects about food poisoning

Food containing natural toxins is the most commonly known cause in our study, accounting for 82.2%, spoiled food and food contaminated with microorganisms accounting for 56.3% and 51.9% (**Table 2**). Food contaminated with chemicals accounts for 34.1%; foreign objects and radiation contamination accounts for only 20.7%. Only 6.7% of subjects know all 5 causes of poisoning and no one does not know any causes. Le Hong Quang's study with food processors in the canteens of Thanh Hoa city's boarding schools in 2020 showed that the most commonly known cause is spoiled food and food contaminated with chemicals with a rate of 100% and 94.8%, while only 66.2% of people know about food containing natural toxins [7]. This difference may be due to the fact that Le Hong Quang's research subjects have a lower level of education than this study.

Knowledge of risk factors for FPO: the factor of using spoiled food is the most known, accounting for 57.8%, followed by improper food processing and preservation and unhygienic habits accounting for 48.2% and 46.7%. Expired food accounts for 36.3%, unsanitary water sources only 17.8%. The proportion of subjects who do not know any risk factors accounts for 14.8%. This result is lower than the study by Nguyen Ngoc Son in 2018 [8]. It is possible that due to the smaller sample size and research location of our study, there is a difference in knowledge of risk factors for food poisoning between the two studies.

Table 2. *Subjects' knowledge of FPO*

	Subject's knowledge of	Frequency (n)	Ratio (%)
Causes of FPO	Food contaminated with microorganisms	70	51.9
	Food contaminated with chemicals	46	34.1
	Foods with natural toxins	110	82.2
	Spoiled food	76	56.3
	Food contaminated with foreign objects and radiation	28	20.7
Risk factors for FPO	Improper processing and storage	65	48.2
	Unhygienic habits	63	46.7
	Unsanitary water source	24	17.8
	Expired food	49	36.3
	Use of spoiled food	78	57.8
	Do not know	20	14.8
Consequences of using unsafety food	Acute poisoning	135	100
	Chronic disease	19	14.1
	Genetic mutations	20	14.8
	Cancer	43	31.9
	Death	70	51.9

Regarding the consequences of using unsafe food, 100% of shop owners and processors know that unsafe food leads to acute poisoning. The rate of knowing that unsafe food causes death is 51.9%, and that it causes cancer is 31.9%. Few people know about deeper consequences such as causing chronic diseases or genetic mutations (only 14.1% and 14.8%). This is very important information when conducting health communication and education sessions, and needs to be emphasized because it easily hits the concerns of the general public.

3.3. Current practice

Regular hand washing with soap and clean water is fundamental to reducing the risk of food contamination. In this study, 80% of people washed their hands properly. Most of the subjects practiced the correct timing of hand washing after going to the toilet (96.3%), after touching garbage (91.9%), before eating (82.2%), and before handling cooked food (71.1%) (**Table 3**). The proportion of subjects practicing hand washing for personal hygiene was quite high, but it is worth noting that hand washing before preparing food was quite low (only 54.8%). This result is much lower than the study by Nguyen Van Tu in a kitchen in Bac Ninh (91.7%) [9]. It is possible that our sample size was smaller. In addition, the processors explained that because they wore gloves and had washed their hands once during the food preparation process, washing their hands again before preparing food was not necessary, so there was such a big difference. This is a misconception, so this issue also needs to be addressed in health education communication sessions.

Table 3. *Hand hygiene practices of food handlers*

	Feature	Frequency (n)	Ratio (%)
Wash hands after (n = 135)	Going to toilet	130	96.3
	Contacting with raw food	80	59.3
	Contacting with bodily fluids	44	32.6
	Touching the garbage	124	91.9
	Scratching, picking ears, picking nose	27	20.0
	Touching animals	38	28.2
	Counting money	13	9.6
Wash hands before (n = 135)	Food processing	74	54.8
	Before eating	111	82.2
	Contact with cooked food	96	71.1
How to wash your hands (n = 135)	Wash with soap and clean water	108	80.0
	Wash with clean water only	27	20.0
How to dry your hands (n = 135)	Use disposable paper towels, clean towels or a blow dryer	92	68.2
	Wipe on clothes, apron	29	21.5
	Do not wipe	14	10.4

Regarding hygiene practices for eating utensils, chopstick holders, spoons, bowls, and plates: meeting all criteria of being dry, clean, and made of waterproof materials only accounts for 30.4%. The rate of processing utensils used specifically for raw and cooked food is still low at 42.2% (**Table 4**). Up to 73.3% of establishments have separate, dry, and clean dish racks/cupboards. Regarding the environment around the kitchen of establishments with kitchen floors (110 restaurants), 91.8% have high, dry floors. Our research results are lower than Dang Quang Tan's research on the status of food hygiene and safety in the collective kitchens of primary schools in Hanoi in 2018 [10]. Clean eating utensils have a direct impact on the health of customers, so it is necessary to ensure that they are cleaned to remove residual grease, starch, etc. These substances will be contaminated with microorganisms over time, and will change in nature, becoming a risk factor for FPO.

Table 4. *Processor practices on hygiene of business establishments*

Feature		Frequency (n)	Ratio (%)
Cleaning for chopsticks, spoons, bowls, plates (n = 135)	Dry	53	39.3
	Clean	51	37.8
	Made of waterproof material	134	99.3
	Not meeting all 3 requirements above	1	0.7
Kitchenware (n = 135)	Used exclusively for raw and cooked food	57	42.2
	Clean	51	37.8
Dish rack (n = 135)	Yes	99	73.3
	No	36	26.7
Kitchen background (n = 110)	Dry	101	91.8
	Wet	9	8.2
	Water spill on floor	0	0.0
Waste treatment (n = 135)	Have a bin, cover, empty daily	77	57.0
	There is a container, with a lid, backlog	0	0.0
	Have a container, no lid, empty daily	49	36.3
	There is a container, without a lid, backlog	0	0.0
	No trash can	9	6.7

Regarding the practice of garbage and waste storage: 57% of places have garbage bins with lids and are emptied daily, this result is lower than Nguyen Ngoc Son's study on four districts of Hanoi in 2018 (90.8%) [9]. There is still a small percentage (6.7%) of establishments that do not have garbage bins, leave garbage in the wrong place, leave it in easily torn plastic bags, in some cases leave it right in front of the shop or in the kitchen, in the dining room or some have garbage bins but they are not sealed (36.3%) which looks very unhygienic and unsightly. This needs to be addressed and resolved promptly because if not handled properly according to regulations, garbage will become a common source of dangerous diseases. It can be seen that although our research sample size is small and the research time is short, the research results have somewhat reflected the current situation of food safety and hygiene at street food processing establishments in Thanh Xuan district, Hanoi city.

4. CONCLUSION

The general knowledge and practice of FPO among main processors is still low. Of which, up to 14.81% of processors do not know the risk factors for FPO. The subjects who know the consequences of using unsafe foods that cause chronic diseases and genetic mutations are less than 15%. Subjects who have the habit of washing their hands before processing food account for 54.8% and after contact with cooked food account for 59.3%. The proportion of processors who only wash their hands with water accounts for 20% of the subjects. Therefore, management agencies need to strengthen inspection and supervision of the implementation of food safety procedures of restaurants in the management area. Organize health check-ups and training on food safety knowledge periodically. Facility owners and processors need to strictly implement the requirements on facility hygiene and personal hygiene. During processing, adhere to the following principles: maintain hygiene, separate raw and cooked food, old and new food, prepare and process properly, store at safe temperatures, use clean water and safe ingredients. It is necessary to ensure food safety in your business and regularly proactively access the latest information on food hygiene and safety.

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