

Food Safety and Perceived Risk: A Case Study of Khao San Road, Bangkok, Thailand

Siripen Yiamjanya, and Kevin Wongleedee

Abstract—Food safety is an important concern for holiday makers in foreign and unfamiliar tourist destinations. In fact, risk from food in these tourist destinations has an influence on tourist perception. This risk can potentially affect physical health and lead to an inability to pursue planned activities. The objective of this paper was to compare foreign tourists' demographics including gender, age and education level, with the level of perceived risk towards food safety. A total of 222 foreign tourists during their stay at Khao San Road in Bangkok were used as the sample. Independent-samples t-test, analysis of variance, and Least Significant Difference or LSD post hoc test were utilized. The findings revealed that there were few demographic differences in level of perceived risk among the foreign tourists. The post hoc test indicated a significant difference among the old and the young tourists, and between the higher and lower level of education. Ranks of tourists' perceived risk towards food safety unveiled some interesting results. Tourists' perceived risk of food safety in established restaurants can be ranked as i) cleanliness of dining utensils, ii) sanitation of food preparation area, and iii) cleanliness of food seasoning and ingredients. Whereas, the tourists' perceived risk of food safety in street food and drink can be ranked as i) cleanliness of stalls and pushcarts, ii) cleanliness of food sold, and iii) personal hygiene of street food hawkers or vendors.

Keywords—Food Safety, Foreign Tourists, Perceived Risk, Khao San Road.

I. INTRODUCTION

KHAO San Road, located in Bangkok, Thailand is a famous touristic enclave in which many first time travelers to Thailand stop and spend approximately two to seven days before moving on to other locations of Thailand or nearby countries. Khao San Road is therefore usually occupied by a number of tourists year round. This small street is dotted with small guesthouses and lodgings, travel agencies, pubs, and restaurants, including street vendors who cater to tourists. Both male and female tourists from various nationalities and different ages gather and enjoy eating and drinking, both in established restaurants and with mobile street food vendors. The possibility of risk received from the consumption of unsafe food and drink is higher away from home. Food service providers and food sellers try to fulfill customers' satisfaction with fast service and food decoration. Nevertheless, with a number of tourists consuming at the same time, hygiene may be overlooked in the process of food preparation. The matter of physical health risk is important to

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tourists since health problems from unsafe food can lead to an inability to pursue their planned activities [1].

II. LITERATURE REVIEW

A. Food Safety

According to Food and Agriculture Organization of the United Nations in Collaboration with the World Health Organization (FAO/WHO) [2], the main goal of food safety and risk management is to protect public health by controlling food risks as effectively as possible through the selection as well as the implementation of appropriate measures. Kleef [3] stated that the way to increase consumers trust in food safety was to maintain these three practices: good risk assessment, risk management, and risk communication. Lepp and Gibson [4] explained that there are seven risk factors perceived by international tourists which are health, political instability, terrorism, strange food, cultural barriers, a nation's political and religion dogma, and crime. Food risk perception was defined in K. Hohl and G. Gaskell [5] by identifying three factors including adulteration and contamination, health effects, and production and hygiene. In the tourism industry, the food sector is one of the main facilitating sectors that support tourists' in situ experience. In many countries, food becomes the core tourism product that attracts tourists and can satisfy them. Wongleedee [6] has studied international senior tourists in Thailand and his findings revealed that the majority of international senior tourists were apprehensive of their susceptibility to high risk of food and beverages in a foreign land. Nevertheless, the majority of international senior tourists rated the quality of food and beverage in Thailand as their highest level of satisfaction. However, food menus, sources of food and cooking premises may pose challenges to this industry, due to the heterogeneity of tourists' demographics. Health and hygiene factors become mattered and perceived differently by different demographics. S. Miles et al [7] studied about the public concern towards food safety by comparing the different opinions on food safety issues, and investigating whether there were any differences in demographic factors. The result regarding demographic differences revealed that there were differences among different genders, ages, and social classes. The research by A. Worsley and E. Lea [8] examined the relationships between consumers' concerns about food and health and their personal values and demographic characteristics in South Australia. The findings showed a statistically significant relationship between the specific concerns and personal values, with an emphasis on the fact that demographic characteristics were important predictors. In Germany, J. Roosen, S. Thiele and K.

Hansen [9] studied about food risk perception of German consumers during 1992 and 2002. They analyzed the consumers' general risk attitudes and their specific perceptions of food risks. The research discussed the socio-demographic variables, stating that female respondents were significantly more likely to be in the cluster of being concerned about natural food risks, while men judged risks as less important. Despite the fact that there are many studies discussing food safety in the literature, studies about food safety in the tourism industry are still limited. Moreover, little research regarding the extent of perceived risk in food products has been conducted [10].

In regard to the fact that tourism is one of the industries in which diverse contacts between people appear. Many tourists from various countries gather together in particular places and do activities such as going out, having parties, eating and drinking. In this regard, it is essential to address the issue of tourists' health, food safety and hygiene.

B. Perceived Risk

Perceived risk is part of the consumers' behaviour and marketing principles. It is a psychological factor that characterizes a buyer and determines the buyer's decision in the decision making process. There are many past studies in tourism that try to investigate the perceived risk of customers in order to reduce risk perception [11]. The literature mostly consists of studies on tourism risks in traveling aspects and risks related to diseases such as SARS, natural disasters such as Tsunami, and terrorism such as the 9/11 attack.

Perceived risk has been defined in various academic fields and contexts of study. Moreover, perceived risk depends on individual consumer's engagement with a particular product or service purchase. It has been described from the simple definition to a more elaborated definition, especially when it is applied in the purchases of different kinds of products and services. Some academics defined perceived risk by pointing to its importance and role in the consumers decision making process; as such, Reichel, Fuchs and Uriel [12] defined perceived risk as an influential determinant that affects consumer behaviour despite the fact that it may not be real. Some others have tried to narrow down the concept of perceived risk to their study contexts. Perceived risk can also be applied in the service industry as in the study by B.C. Bao [13], in which it was explained as an influence on the level of perceived service quality, which afterwards shapes customer satisfaction. The later studies relevant to perceived risk propose perceived risk frameworks with a generation of different types of risks and risks in different types of products and services. M.S. Carroll [14] studied about the spectators' perceived risk during their attendance of a sport event, proposing the definition of perceived risk as an individual's perceptions of the uncertainty and negative consequences constructed during attending a sport event, and will have impacts on future intentions to visit. The definition is broken down into psychosocial risk, physical risk, time risk, performance risk, and financial risk. Griffin and Viehland [15]

in their study defined perceived risk in the context of online shopping by product categories assessed with demographic factor. From the review of the literature in Table I, the perceived risk in this paper can be defined as individual tourist's perception of uncertainty during their experiencing of food and drink on Khao San Road, Bangkok.

TABLE I
 DEFINITION OF PERCEIVED RISK

Author	Year	Definition
K. A. Nyako and A. Thompson [16]	1999	Perceived risk influences risk reduction behaviour.
L.F. Cunningham, H. Gerlach, M.D. Harper, and C.E. Young [17]	2005	Perceived risk is defined as a determinant that lasts from the stage of information search, the purchase action of customers and the delivery of the service.
A. Reichel, G. Fuchs, and N. Uriely [12]	2007	Perceived risk is defined as an influential determinant that affects consumer behavior despite the fact that it may not be real.
M. S. Carroll [14]	2009	Perceived risk can be defined as an individual's perceptions of the uncertainty and negative consequences constructed during experiencing of some things or some places and will have impacts on future intention to purchase or visit. These perceived risks include psychosocial risk, physical risk, time risk, performance risk, and financial risk.
B. C. Bao [13]	2009	In service quality, perceived risk is defined as a determinant that influences the level of perceived service quality which afterward shapes customer satisfaction.
A. Griffin and D. Viehland [15]	2011	Perceived risk is defined as a determinant associated with demographic factors.

III. METHODOLOGY

The population for this paper was foreign tourists who were visiting Khao San Road, Bangkok, Thailand during June 1-June 30, 2012. Since the population was estimated to be roughly 500 members or less per day, the sample size of 222 was calculated by using Yamane table with 5 percent of sampling errors [18]. Random sampling method was utilized to make certain that each member of the population had an equal chance of being selected. The tool of this research paper was a self-administrated questionnaire, which was divided into 2 main parts: first, the respondents' demographic and general travel information, and second, the level of perceived risk towards food safety based on 12 hygiene variables. The respondents were asked to mark their perceived risk along a five-point, Likert-type scale from very low risk to very high risk. The test of mean difference was subjected to

independent- samples t- test for gender variable. And analysis of variance (ANOVA) was tested on age and education. A Least Significant Difference or LSD post hoc test was also conducted.

IV. FINDINGS

The findings of this research paper can be encapsulated into 4 groups.

A. Demographic and Travel Profile

A total of 230 questionnaires were distributed for this research. After eliminating 8 ineffective questionnaires, 222 effective samples were usable. Table II describes the demographic and general travel information of the foreign tourists. The gender mix is well balanced with 110 males (49.5 percent) and 112 females (50.5 percent). The majority of the respondents, 49.5 percent, were between the age of 21 and 30. The second and third largest age group was between 31 and 40 (17.1 percent), and 41 and 50 years old (15.3 percent) respectively. It is interesting to note that the education is mainly college/ university (54.5 percent) whereas graduate school also shares a secondarily high percentage of 27.0. Regarding the question "Have you been to Thailand before?" the most common group is *First time* which is 53.6 percent, followed by *A few times* (27.5 percent), and *Many times* (18.9 percent). Most tourists planned their trip by themselves (93.7 percent) rather than buying a packaged tour (6.3 percent). For the question of how many days they have been in Bangkok, the highest percentage falls to the 3- 4 days group (36.5 percent), followed by 1- 2 days (28.4 percent), and more than 6 days (22.1 percent). The most common answer for the question "Have you ever been sick during your visit/ stay at Khao San Road?" is "No" which is 90.5 percent, whereas "Yes" accounts for only 9.5 percent. The last question of the first part of the questionnaire addresses the information of whether they found any difficulty in finding a pharmacy store to buy medicine if they became sick from food. A notably high number of 207 respondents present the answer "No" (93.2 percent).

TABLE II
DEMOGRAPHIC AND GENERAL TRAVEL INFORMATION OF FOREIGN TOURISTS

	Frequency	Percent	N
Gender			222
Male	110	49.5	
Female	112	50.5	
Age			222
Below 20 – 20 years old	23	10.4	
21 – 30 years old	110	49.5	
31 – 40 years old	38	17.1	
41 – 50 years old	34	15.3	
More than 50 year old	17	7.7	
Education			222
Primary school	6	2.7	
High school	35	15.8	
College/ University	121	54.5	
Graduate school	60	27.0	

Have you been to Thailand before?			222
First time	119	53.6	
A few times	61	27.5	
Many times	42	18.9	
How did you plan for your trip to Thailand?			222
I planned the trip by myself	208	93.7	
I bought packaged tour	14	6.3	
How many days have you been in Bangkok?			222
1-2 days	63	28.4	
3-4 days	81	36.5	
5-6 days	29	13.1	
More than 6 days	49	22.1	
Have you ever been sick during your visit/ stay at Khao San Road?			222
Yes	21	9.5	
No	201	90.5	
Do you find any difficulty / or do you think it is difficult in finding pharmacy store to buy medicine if you get sick from food?			222
Yes	15	6.8	
No	207	93.2	

B. Perceived Risk for Food Safety by Hygiene Variables

Table III reports levels of perceived risk for food safety using 12 hygiene variables and overall perceived risk. Mean (*M*) and standard deviation (*SD*) of the 12 variables is shown for the sample population of 222 foreign tourists. Across all hygiene variables in the set of food and drink in established restaurants, *Cleanliness of dining utensils* has the highest risk score ($M = 2.89, SD = 0.923$), which is above the mid- point ($M = 2.86, SD = 1.004$) of the 5- point Likert scale. Hygiene in the set of street food and drink reveals *Cleanliness of stalls and pushcarts* has perceived a highest risk ($M = 3.05, SD = 0.952$) with the score higher than the mid- point.

TABLE III
PERCEIVED RISK FOR FOOD SAFETY BY HYGIENE VARIABLES

	Mean	SD	Rank
Hygiene variables of food and drink in established restaurants			
1. Cleanliness of dining location	2.86	0.993	4
2. Cleanliness of dining utensils	2.89	0.923	1
3. Personal hygiene of staff working in the restaurant	2.84	1.028	5
4. Sanitation of	2.89	0.955	2

5. Cleanliness of food preparation area	2.87	1.030	3
6. Cleanliness of food seasoning and Ingredients	2.81	1.093	6
6. Cleanliness of food and drink that are served	2.81	1.093	6
Overall	2.86		

Hygiene variables of street food and drink

1. Cleanliness of stalls and pushcarts	3.05	0.952	1
2. Personal hygiene of street food hawkers/vendors	2.94	0.952	3
3. Disease history of street food hawkers or vendors	2.86	1.033	5
4. Cleanliness of food cooking method	2.88	1.033	4
5. Cleanliness of food that is sold	2.98	1.065	2
6. Cleanliness of drinks that are sold	2.72	1.025	6
Overall	2.91	1.040	

C. Difference on Tourists' Perceived Risk for Food Safety by Gender

An independent- samples t- test indicates that there is no difference between male and female in their perceived risk for safety of food and drink served in established restaurants (see Table IV). The findings indicate the same with street food and drink (see Table V). Only the variable of cleanliness of drinks that are sold shows a difference between male and female at the 0.05 confidence level.

TABLE IV
FOREIGN TOURISTS' PERCEIVED RISK TOWARDS HYGIENE OF FOOD AND DRINK IN ESTABLISHED RESTAURANTS ON KHAO SAN ROAD

HYGIENE VARIABLES	MALE	N =	FEMALE	N =	t	SIG.
	MEAN	110	MEAN	112		
1. Cleanliness of dining location	2.86	0.953	2.87	1.035	-0.018	0.985
2. Cleanliness of dining utensils	2.84	0.883	2.94	0.961	-0.816	0.415
3. Personal hygiene of staff working in the	2.81	1.009	2.88	1.049	-0.477	0.634

4. Sanitation of food preparation area	2.84	0.924	2.95	0.985	-0.858	0.392
5. Cleanliness of food seasoning and ingredients	2.83	1.030	2.92	1.032	-0.667	0.505
6. Cleanliness of food and drink that are served	2.81	1.071	2.81	1.119	-0.023	0.982

TABLE V
FOREIGN TOURISTS' PERCEIVED RISK TOWARDS HYGIENE OF STREET FOOD AND DRINK ON KHAO SAN ROAD

HYGIENE VARIABLES	MALE	N =	FEMALE	N =	t	SIG.
	MEAN	110	MEAN	112		
1. Cleanliness of stall or pushcart	3.00	0.986	3.10	0.920	-0.768	0.444
2. Personal hygiene of street food hawkers or vendors	2.94	1.025	2.95	0.879	-0.079	0.937
3. Disease history of street food hawkers or vendors	2.84	1.027	2.98	1.043	-0.407	0.685
4. Cleanliness of food cooking method	2.85	1.051	2.91	1.018	-0.470	0.639
5. Cleanliness of food that is sold	2.96	1.083	2.99	1.053	-0.191	0.848
6. Cleanliness of drinks that are sold	2.77	1.246	2.66	1.167	0.691	0.049

D. Difference on Tourists' Perceived Risk towards Food Safety by Age and Education Level

An analysis of variance (ANOVA), with the mean difference significance at the 0.05 level, was used to test significant variation of perceived risk between sets of demographic variables (age groups and education level) with all hygiene variables of food and drinks in established restaurants and street food and drink on Khao San Road. The analysis shows no significance between variables ($p > 0.05$).

Tourists' perceived risk towards food safety does not seem to differ significantly by age and education level. Thus, the author used LSD (Least Significant Difference) post hoc test with the mean difference significance at the 0.05 level, to detect which of the specific groups differ in mean difference significance and how. The post hoc test shows that some pairs of means are different (see Table VI – XI).

E. Multiple Comparisons by Least Significant Difference Post Hoc Test

1. Comparisons Among Age Groups and Perceived Risk towards Cleanliness of Dining Utensils

By the Post Hoc test, Table VI shows that the age group of below 20 - 20 years old and 31 - 40 years old (*Sig.* = 0.016), and the age group of below 20 - 20 years old and above 50 years old (*Sig.* = 0.036) are statistically significant in terms of perceived risk towards cleanliness of dining utensils.

TABLE VI
PERCEIVED RISK TOWARDS DINING UTENSILS (AGE FACTOR)

	Below 20 - 20	21 - 30	31 - 40	41 - 50	Above 50
Below 20 - 20		0.016*			0.036*
21 - 30					
31 - 40					
41 - 50					
Above 50					

* Significant at $\alpha = 0.05$

2. Comparisons Among Age Groups and Perceived Risk towards Sanitation of Food Preparation Area

Table VII illustrates a significant difference in perceived risk towards sanitation of the food preparation area between the age groups of 21 - 30 years old and above 50 years old (*Sig.* = 0.048), and the age group of 41- 50 years old and above 50 years old (*Sig.* = 0.004).

TABLE VII
PERCEIVED RISK TOWARDS SANITATION OF FOOD PREPARATION (AGE FACTOR)

	Below 20 - 20	21 - 30	31 - 40	41 - 50	Above 50
Below 20 - 20					
21 - 30					0.048*
31 - 40					
41 - 50					0.004*
Above 50					

* Significant at $\alpha = 0.05$

3. Comparisons Among Education Level Groups and Perceived Risk towards Cleanliness of Dining Location

Table VIII demonstrates a significant difference in perceived risk towards cleanliness of the dining location between the respondents who hold grade school and high school (*Sig.* = 0.043).

TABLE VIII
PERCEIVED RISK TOWARDS CLEANLINESS OF DINING LOCATION (EDUCATION FACTOR)

	Grade School	High School	College/University	Graduate School
Grade School		0.043*		
High School				
College/University				
Graduate School				

* Significant at $\alpha = 0.05$

4. Comparisons Among Education Level Groups and Perceived Risk Towards Personal Hygiene of Staff Working in Restaurant

Table IX demonstrates a significant difference in perceived risk towards personal hygiene of staff working in restaurant. The respondents who are in grade school and in high school are statistically significant (*Sig.* = 0.043).

TABLE IX
PERCEIVED RISK TOWARDS PERSONAL HYGIENE OF STAFF WORKING IN RESTAURANT (EDUCATION FACTOR)

	Grade School	High School	College/University	Graduate School
Grade School		0.043*		
High School				
College/University				
Graduate School				

* Significant at $\alpha = 0.05$

5. Comparisons Among Education Level Groups and Perceived Risk Towards Sanitation of Food Preparation Area

Table X shows that there is a significant difference in perceived risk between the respondents who are in grade school and in graduate school (*Sig.* = 0.045) as well as between the respondents with high school and graduate school education level (*Sig.* = 0.044). Table X also reports a significant difference between those with college or university and graduate school education level (*Sig.* = 0.036).

TABLE X
PERCEIVED RISK TOWARDS SANITATION OF FOOD PREPARATION AREA (EDUCATION FACTOR)

	Grade School	High School	College/University	Graduate School
Grade School				0.045*
High School				0.044*
College/University				0.036*
Graduate School				

* Significant at $\alpha = 0.05$

6. Comparisons Among Education Level Groups and Perceived Risk Towards PERSONAL Hygiene of Street Food Hawkers or Vendors

Table XI reports that there is a significant relationship between the respondents with grade school and graduate school education level (*Sig.* = 0.034) in perceived risk towards personal hygiene of street food hawkers or vendors.

TABLE XI
PERCEIVED RISK TOWARDS PERSONAL HYGIENE OF STREET FOOD HAWKERS OR VENDORS (EDUCATION FACTOR)

	Grade School	High School	College/University	Graduate School
Grade School				0.034*
High School				
College/University				
Graduate School				

* Significant at $\alpha = 0.05$

V. DISCUSSION

A. Gender Factor

Several studies [7], [9], [19], [20] revealed that gender was associated with food safety perceived risk. Some [7], [8] indicated that women were more concerned, sensitive or anxious about food safety than men. The findings of this study did not coincide with these previous findings [7], [8], [19]. The findings suggested that there was no significant difference between male and female tourists in terms of perceived risk towards food safety on Khao San Road. Nevertheless, it was comparable to some other studies [21], [22] that indicate little or no difference in risk perception between genders.

B. Age Factor

With respect to the age factor, quite a few studies [20], [23], [24] found that consumers' age groups showed significant influence on how they perceived the probability of risk in food. A research by J. Roosen, S. Thiele and K. Hansen [9] found that older consumers were more likely to be aware of food risk such as food poisoning. But this research revealed the opposite result, as no significant correlation appeared between perceived risk and age demographic. Conversely, our findings seemed to concur with some findings [16], [24] which reported that demographic factors such as age and gender may not be able to predict precisely consumers' perception about food safety such as safety of drinking water and uncertainty about food content.

C. Education Factor

Degree and non-degree holders were found to have different perceived risk and concern towards food safety-related risk (i.e. chicken meat) [23]. The education factor, in other studies [17], [24] was presented as the determinant in consumers' risk perception of food. A study [25] found that less educated people seemed to have higher perceived risk in food safety. However, the findings of this research found that different levels of education among the sample tourists showed no relation with their level of perceived risk towards food safety.

Previous studies in the food safety literature mainly showed the results and discussed in general food product consumer viewpoints. This study is useful in that it addresses food safety and perceived risk in the context of tourists. The findings may not be able to be generalized in other contexts. Yet it suggests that further studies of food safety and consumers in the tourism industry may be conducted with an emphasis on socio-demographic and psychological factors such as types of tourists, which would be able to give a more clear answer of tourist risk perception on food and drink consumption during their holiday.

Food is part of the service industry whose inherent properties are heterogeneity and intangibility, implying that these properties can undermine consumers' confidence and result in an increased perceived risk [26]. Restaurants' owners, managers, and tourism authorities may need to take this fact as an important matter and pay enough regard to

cleanliness, even with small things as such the dining utensils or equipments and create a food safety atmosphere with physical evidence of cleanliness to food outlet. Furthermore, an open cooking area which is more exposed to diners' scrutiny may help reduce their perceived risks and increase the confidence of dining, as well as influence a positive behaviour of restaurant staff [27]. Increasing higher standards on hygiene and making it tangible in the food preparation process, dining location and selling stalls, dining and cooking equipments, as well as increasing hygiene knowledge and grooming of food and drink sellers and service providers, can ultimately be a way of enhancing the tourists' confident enjoyment and thereby generating income to this small sector of food service.

VI. LIMITATION AND FUTURE RESEARCH

Limitation of this paper concerns a question of whether the sample is representative of the total population. Further research may compare foreign tourists' income level, travel purposes, types of tourist, or existing knowledge of food safety with the level of perceived risk towards food safety. The use of different tourist sites for collecting data would add some value to tourism literature. Additional studies should be focused on an exploratory research on what truly helps mitigate risk perception in the food sector, especially in respect to consumers in tourism industry, as well as on senior consumer market which will have an immense merit in the ageing society phenomenon.

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