Does Food Safety Build Customer Trust? The Mediating Role of Perceived Risk in Food Delivery Service in Bangkok during the COVID-19 Pandemic

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Abstract

This research investigated the role of perceived food safety on customer trust and its mechanism via perceived risk in the food delivery service business during the COVID-19 pandemic. Survey data were collected from 600 food delivery customers in the Bangkok area. However, only 505 sets of questionnaires were completed and returned to the researcher with a response rate of 84.16%. The data were proceeded using WarpPLS 7.0 program to perform partial least squares Structural Equation Modeling (SEM), which was proven suitable for this research. The results showed that perceived food safety could directly promote customer trust (β=0.528; p<0.001). On the other hand, it can also indirectly foster customer trust by decreasing perceived risk (β=-0.123; p=0.003), which will eventually promote customer trust (β=-0.179; p<0.001). In other words, perceived risk partially mediates the association between perceived food safety and customer repurchase intentions (t=2.273; p=0.022). Therefore, customers' trust can be built by providing food safety standards to foster their confidence and perceive minimal risk levels. The findings provided additional empirical evidence of marketing knowledge that the social exchange theory can explain. The results can be applied as a guideline for food delivery service businesses to escalate their service and standards to build customer trust and gain competitive advantages, particularly during pandemics when customers are more health-conscious than ever.

Keywords: Food safety, Customer trust, Perceived risk, Food delivery, COVID-19

Introduction

The food delivery service has grown significantly in popularity worldwide in response to the shift in people's lifestyles, especially in big cities. As the capital of Thailand, Bangkok is one of the most populated cities in the ASEAN. People of Bangkok spend hours in heavy traffic daily commuting between home and work. Thus, food delivery service in Bangkok has been growing extensively in demand. In this light, the food delivery business has emerged and

is now getting more intense competition. In particular, with the impacts of COVID-19, people are prohibited from eating out since they have to work from home. In such a crisis, food delivery service seems to be a safe choice for many consumers. Unlike other businesses struggling to survive the impacts of the pandemic, food delivery service businesses are a fast-growing section that has gained tremendous popularity among consumers. According to the Office of Trade Competition Commission (2020), due to the COVID-19 pandemic, restaurants were limited to operating picking up and delivery service. The food delivery business volume in 2019 was 35 million baht. It was projected to expand to 66 to 68 million baht or 78 to 84% by 2020 (Kasikorn Research Center, 2020). Hence, they must gain a competitive edge to achieve sustainable business success. One of the essential factors that can lead to many other businesses' preferred outcomes is customer trust. It is believed that once businesses gain customer trust, they can achieve several positive business outcomes, such as customer satisfaction and customer loyalty (Glaveli, 2020; Rafiq et al., 2020). However, gaining trust from customers is not an easy task in a crisis like this. People are alert to possible channels that can cause infection and other health concerns. Even though they feel safer eating at home, there are possibilities of getting infected since they still need to be in contact with food deliverers during the transferring process. Thus, understanding customers and knowing how to promote their trust is crucial to food delivery and other related businesses. Even though many scholars have examined customer trust in many industries and contexts, it is still very limited in the food service industry (Iglesias et al., 2020; Leninkumar, 2017).

This research will investigate the impact on customer trust of customers' food safety perception, one of the most critical foodservice industry issues (Ha et al., 2019; Liao et al., 2020). Food safety is essential for consumers in evaluating their restaurant options associated with perceived food and service quality (Cha & Borchgrevink, 2019). However, customers' food safety perception has been limitedly explored in foodservice industry studies, particularly as the antecedent of customer trust. Besides, this research will examine their mechanism via customer risk perception.

Literature review

This study investigates the roles of perceived food safety on customer trust and the mediating role of perceived risk under assumptions derived from the concept of the social exchange theory.

Social exchange theory

The social exchange theory's main idea is based on the concept that a relationship between two parties is developed through cost-benefit analysis (Cook et al., 2013). This theory does not measure a relationship based on emotions. Instead, it relies on empirical methods, mathematics, and logic to determine the balance between risks and benefits within a relationship. It can measure the balance of various relationships, such as romantic relationships, friendships, and even business relationships, to determine the effort put in by a party in a relationship. The foundation of social exchange theory stands on various assumptions focusing on human nature and the nature of different types of relationships. This theory assumes that

people always seek rewards while avoiding punishment. Hence they tend to interact and develop relationships to maximize their benefit with minimal cost. They analyze their costs and benefits before engaging with others, varying from person to person. As long as their benefit outweighs their cost, the relationship remains. Researchers widely adopt the social exchange theory to explain relationships and phenomena in business and marketing (Paparoidamis et al., 2019; Ratasuk, 2021). In many business contexts, the social exchange theory has been applied to explain the relationship between organizations and their customers developed from the exchange of benefits between the two parties (Paparoidamis et al., 2019; Ratasuk & Buranasompob, 2021). According to the theory, this study chose this theory to explain the relationship between perceived food safety and customers' trust and the mediating role of perceived risk in the food delivery business because trust is a desired positive relationship with customers that businesses need for their long-term success.

Perceived food safety

Food safety is the primary and essential factor required for food products (Fung et al., 2018). Consumers primarily expect all food they buy to be safe to consume, and thus, a severe negative feeling is generated once food safety is absent (Bouranta et al., 2019; Ilie & Georgescu, 2019). It concerns physical, chemical, and biological hazards that can cause foodborne illness (Wang & Tsai, 2019). Food safety is an important topic centered on several parties, including governmental organizations, food producers, and consumers. In particular, food service businesses are often criticized once consumers face food safety issues; therefore, they should maintain positive consumer perceptions of food safety. The concept of food safety has been applied widely throughout the food supply chain in food industries worldwide (Kumar et al., 2017). Many studies explore food safety's roles in food production (Carvalho, 2017; Liao et al., 2020). Food safety has also been investigated in the food delivery service, yet it is still limited (Hodges Jr, 2020). For example, Aprilianti and Amanta (2020) investigated how to promote food safety in Indonesia's online food delivery.

Customer trust

Trust is a vital factor that maintains the relationships in society, enabling it to function irregularly (Leninkumar, 2017). Trust refers to individuals' positive attitude or expectancy to rely on others to fulfill their obligations (Leninkumar, 2017; Ratasuk & Charoensukmongkol, 2019). In business, customer trust is the optimistic feeling of customers towards products and services or companies that will provide the quality they expect (Ye et al., 2019). According to Glaveli (2020), trust can be broadly categorized into individual and organizational levels. The organizational level of trust covers customers' trust in companies and their products and services, and it is interpersonal trust between a customer and a company representative that eventually becomes organizational trust. A company's overall trustworthy behavior is communicated through its representatives, especially in the service industry like hospitals that gain customer trust via their doctors' and nurses' performance and behavior and airlines that

depend on their staff's performance and behavior (Božič et al., 2020; Glaveli, 2020; Li et al., 2020).

In contrast, the absence of customer trust in a company can negatively impact a customer's interpersonal trust in a company's staff. This customer trust is complex and requires a certain period to develop, and it is built through customers' satisfactory experience with products and services (Jalilvand et al., 2017). Customer trust can lead to preferred outcomes, such as customer loyalty, repurchase intentions, and customer satisfaction (Iglesias et al., 2020; Lam et al., 2016; Setiawan & Sayuti, 2017).

Perceived risk

Customers' perceived risk refers to their expectation of losses and undesired outcomes of buying a product or service (Ariffin et al., 2018). Perceived risk plays a vital role in consumer decision-making; their perception of risk is critical in their alternative evaluation and purchasing actions. Consumers perceive a higher risk when facing unstable or negatively unexpected situations. Perceived risks in products and services discouraged business intentions and activities (Ariffin et al., 2018; Casidy & Wymer, 2016; Hussain et al., 2017). For example, Pattanapomgthorn et al. (2020) revealed that perceived risk decreases customers' buying intention toward GM food.

Hypotheses development

Perceived food safety and customer trust

According to the social exchange theory, customers' trust in an organization can be firmly developed on the ground of confidence, reliance, and expectation of the organization's performance, which plays a crucial role in developing decent experience and perception and supportive environments for a preferable relationship between them (Paparoidamis et al., 2019). Customers' good experience with products and services would create positive feelings towards companies and develop trust (Leninkumar, 2017). Food safety, which can lead to customer satisfaction and a pleasant experience with products and services, should also foster customer trust (Cha & Borchgrevink, 2019; Mittendorf & Ostermann, 2017). Hence, the following hypothesis is proposed.

H1: Perceived food safety has a positive association with customer trust

Perceived food safety and perceived risk

Unlike non-food hazards, food safety can lead to severe foodborne illness; thus, unhygienic conditions and environments can risk consumers (Pattanapomgthorn et al., 2020). Food safety concerns, such as food temperature, hygiene of food handlers, and the environment customers perceive when receiving their food, can determine the perceived risk to their health (Ha et al., 2019; Nam et al., 2019; Nguyen & Huynh, 2018). Thus, the following hypothesis is proposed.

H2: Perceived food safety has a negative association with perceived risk

Perceived risk and customer trust

When individuals detect particular risks from their purchase, they tend to feel skeptical and develop negative attitudes towards products, services, and companies; hence, the negative feelings will destroy trustworthiness (Marriott & Williams, 2018). Prior research found a negative association between perceived risk and customer trust (Damghanian et al., 2016; Mittendorf & Ostermann, 2017). Hence, the following hypothesis is proposed.

H3: Perceived risk is negatively associated with customer trust

Perceived food safety, perceived risk, and customer trust

To summarize all variables' proposed relationships, customers' food safety perception can influence their repurchase intentions because low food safety can cause foodborne illness and risk their life. Once risk is perceived, customers feel threatened, distrust service providers, and switch to other companies. Therefore, the following mediation hypotheses are proposed.

H4: Perceived risk positively mediates the relationship between perceived food safety and customer trust

Methodology

Sample and data collection procedure

The context of this study focuses on customers of food delivery service companies who reside in the Bangkok area. These customers must regularly use food delivery services carriers provide via their mobile applications. This research employed a quantitative approach by conducting a survey. A self-administered questionnaire survey was used for data collection. The samples were selected using a purposive and stratified random sampling method. A total of 500 food delivery customers from 50 districts of Bangkok were initially approached. Ten qualified customers who use food delivery service at least three times a week were selected and approached with the survey in each district. The survey will be conducted starting from mid of January and ending in late February 2021. It will be distributed randomly, asking whether they are qualified to participate in the study. Participation in the survey will be voluntary. The questionnaire includes a cover letter stating clearly the research objectives and instructions. The participants were informed about the anonymity of the data collection. The questionnaires contain two main parts: participants' characteristics and question sets measuring participants' attitudes towards latent variables in the research model.

Measures

All variables will be measured using proven valid and reliable scales adapted from previous studies.

Customer trust will be measured using the three-item scale adapted from Leninkumar (2017). All items will be rated on five-point Likert scales ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Sample question items are "Overall, I have complete trust in the food delivery company". And "The food delivery company honestly treats me in every transaction".

Perceived risk will be measured using the four-item scale adapted from Yu et al. (2018). All items will be rated on five-point Likert scales ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Sample question items are "Using food delivery service of this company exposes me to overall risk". and "I do not feel safe using food delivery service of this company".

Perceived food safe will be measured using the six-item perceived scale adapted from Bouranta et al. (2019); Cha and Borchgrevink (2019). All items were rated on five-point Likert scales ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Sample items are "this food delivery company is capable of ensuring food safety" and "Food deliverer keeps hygiene mask on at all times".

All question items were translated and presented in Thai to suit the sample group and the scope of the study.

Control variable

This study included five control variables, including gender, education, income, and age. These variables were found in previous research as factors affecting consumer behaviors in business and management contexts, and these control variables were added to the research model to be alternatives to the main variables. In addition, even though they are interested in the research's aims, they are controlled because they could affect the results.

Data analysis

This study will use partial least square structural equation modeling (PLS-SEM) to analyze the proposed research model. PLS combines a principal component analysis, path analysis, and a set of regressions to generate estimates of the standardized regression coefficients for the model's paths and factor loadings for the measurement items (Chin, 1998; Lin et al., 2020). Additionally, PLS does not require a large sample size and normally distributed data, and it produces less bias than other structural equation modeling techniques if the sample size is small or the data is not normally distributed (Hair et al., 2012). WarpPLS 7.0 program is selected because it is the latest version that has been improved from previous versions in many functions. Before the PLS-SEM proceeds, descriptive statistics, validity and reliability tests, normality tests, multicollinearity tests, and model-fit indices will be conducted to evaluate the model quality.

The data collection methodology and a self-administered questionnaire have been reviewed and met all Research Ethics Committee (REC) requirements, granting a reference number of PIM-REC 036/2563.

Results

The sample of 505 food delivery customers who participated in this study and the descriptive statistics of their characteristics, including gender, age, income, and education, are presented in Table1.

Table 1 Sample characteristics

	Characteristics	Descriptive statistics
Gender	Male	230 (45.54%)
	Female	275 (54.46%)
Age	18 to 20 years old	115 (22.77%)
	21 to 30 years old	289 (57.23%)
	31 to 40 years old	78 (15.45%)
	41 to 50 years old	12 (2.38%)
	51to 60 years old	7 (7.3%)
	Older than 60 years old	1 (0.20%)
Income	Less than 10,000 Baht	141 (25.94%)
(per month)	10,001 to 20,000 Baht	200 (39.60%)
	20,001 to 30,000 Baht	130 (25.74%)
	30,001 to 40,000 Baht	30 (5.94%)
	40,001 to 50,000 Baht	5 (0.99%)
	More than 50,000 Baht	4 (0.79%)
Education	Lower than high school	14 (2.77%)
	High school	72 (14.26%)
	Associate degree	72 (14.26%)
	Undergraduate degree	296 (58.16%)
	Master degree	45 (8.91%)
	Doctoral degree	4 (0.79%)

According to Table 1, the sample includes 275 female participants (54.46%) and 230 male participants (45.54%). Two hundred eighty-nine participants (57.23%) are 21 to 30 years old, and 115 (22.77%) are 18 to 20. Two hundred participants (39.60%) earn from 10,001 to 20,000 Baht per month, and 141 (25.94%) earn less than 10,000 Baht per month. Two hundred ninety-six participants (58.16%) have an undergraduate degree, 72 (14.26%) have an associate degree, and the same number have a high school diploma.

Table 2 Indicator loadings and cross-loadings of latent variables

Variables	FSafety	CTrust	Risk
FSafety1	(0.811)	-0.025	-0.050
FSafety2	(0.811)	0.031	-0.035
FSafety3	(0.828)	-0.040	0.062
FSafety4	(0.811)	-0.029	-0.026
FSafety5	(0.740)	0.069	0.052
CTrust1	0.069	(0.771)	-0.036

Variables	FSafety	CTrust	Risk
CTrust2	-0.024	(0.779)	0.001
CTrust3	0.027	(0.784)	0.006
CTrust4	-0.069	(0.814)	0.027
Risk1	0.007	-0.019	(0.914)
Risk2	-0.041	0.031	(0.903)
Risk3	0.024	0.006	(0.904)
Risk4	0.010	-0.017	(0.923)

Note: FSafety= perceived food safety intention, CTrust= customer trust, and Risk= perceived risk

The model quality was tested in various dimensions: First, its convergent validity was ideal if its factor loadings were at least 0.7 (Hair, 2011). In Table 2, all factor loadings of all variables were above 0.7, indicating that the model's convergent validity was ideal.

Table 3 Correlation among variables and the square root of the average variance extracted

Variables	Cronbach's alpha coefficient	Composite reliability Coefficient	FSafety	CTrust	Risk	Gen	Age	Income	Edu
FSafety	0.860	0.899	(0.801)						
CTrust	0.795	0.867	0.637**	(0.787)					
Risk	0.932	0.951	-0.027	-0.070	(0.911)				
Gen	1.000	1.000	-0.140**	-0.153**	0.129**	(1.000)			
Age	1.000	1.000	-0.043	-0.020	0.033	0.050	(1.000)		
Income	1.000	1.000	0.135**	0.117**	-0.143**	0.010	0.600**	(1.000)	
Edu	1.000	1.000	0.121**	0.113*	-0.074**	-0.007	0.249**	0.431**	(1.000)

Note: * p- value of <0. 05, * * p- value of <0. 01; FSafety= perceived food safety, CTrust= customer trust, Risk= perceived risk, GEN= gender, Age= age of participant, Income=income; the square root values of the AVE are presented in parentheses.

Second, the model has tested its discriminant validity by comparing its square root values of the average variance extracted (AVE) with other relevant correlations of each variable (Ab Hamid et al., 2017). Table 3 shows that the AVEs of all variables are higher than their relevant correlations indicating a satisfying level of discriminant validity of the model. Third, Cronbach's alpha and composite reliability coefficients were used to verify the model's reliability, which both are suggested to be no less than 0.7 to be acceptable (McNeish, 2018). The lowest coefficient is 0.795, which means the model's reliability was satisfied, as shown in Table 3. Fourth, the model's multicollinearity was tested using the complete variance inflation factor (VIF) values, which should not be over 3.3 to be ideal and 5 to be maximum to accept (Kock & Lynn, 2012; Senaviratna & Cooray, 2019). The model's highest full VIF was 2.192, lower than 3.3 indicating no sign of a severe multicollinearity issue. Finally, the model was tested for a possibility of common method bias (CMB), which can also be identified when the

full collinearity VIFs are higher than 3.3 (Hair et al., 2017; Kock, 2015); thus, the CMB is not a critical issue.

Table 4 PLE-SEM model fit indices

Model fit indices	Coefficient	Result
Average path coefficient (APC)	0.140**	Significant
Average R-square (ARS)	0.185**	Significant
Average adjusted R-square (AARS)	0.180**	Significant
Average variance inflation factor (AVIF)	1.123	Ideal
Average full variance inflation factor (AFVIF)	1.477	Ideal
Tenenhaus GoF index (GoF)	0.401	Large
Simpson's paradox ratio (SPR)	0.909	Acceptable
R-square contribution ratio (RSCR)	0.999	Acceptable
Statistical suppression ratio (SSR)	1.000	Acceptable
Nonlinear bivariate causality direction ratio (NLBCDR)	0.909	Acceptable

Note: ** and * mean a p-value of <0.01 and ≤0.05, respectively.

Moreover, the model's overall quality was tested using the ten model-fit indices from the PLS-SEM analysis presented in Table 4 (Kock, 2017). The results show that all indices were satisfied, which means this research model has sufficient quality.

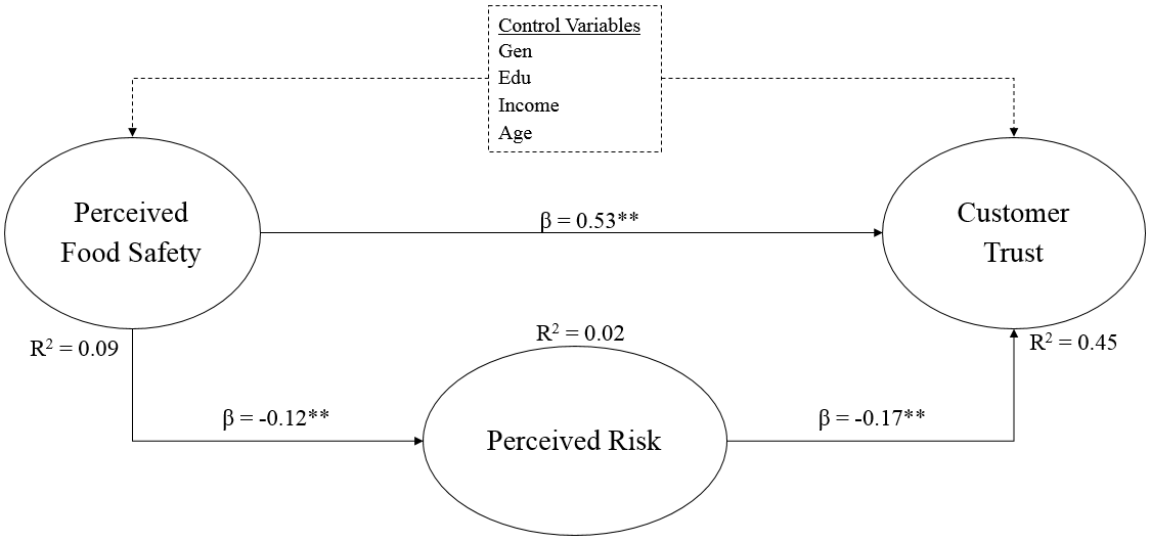

Figure 1 Structural equation model results
Note: ** and * mean a p-value of <0.01 and ≤0.05, respectively.

Figure 1 presents the PLS-SEM analysis results as follows:

Hypothesis 1 Perceived food safety has a positive association with customer trust. The results showed a significant positive relationship between the two variables ($\beta = 0.528$; $p<0.001$). Thereby, hypothesis 1 was supported.

Hypothesis 2 Perceived food safety has a negative association with perceived risk. The results revealed a significant negative relationship between the two variables ($\beta = -0.123$; $p=0.003$). Thereby, hypothesis 2 was supported.

Hypothesis 3 Perceived risk is negatively associated with customer trust. The results showed a significant negative association between perceived risk and customer trust ($\beta=-0.179$; $p<0.001$). Thereby, hypothesis 3 was supported.

Hypothesis 4 Perceived risk positively mediates the relationship between perceived food safety and customer trust. According to the Sobel test results suggested by Hayes and Preacher (2014), perceived risk has significant positive mediation on the relationship ($t = 2.273; p = 0.022$), indicating that perceived risk mediated the relationship. Therefore, hypothesis 4 was supported.

Furthermore, the results also showed that none of the control variables was statistically associated with customer trust, but there were significant associations between all control variables and perceived food safety. The findings indicated that gender ($\beta=-0.135$; $p<0.001$), age ($\beta=-0.074$; $p=0.047$), income ($\beta=0.166$; $p<0.001$), and education ($\beta=0.159$; $p<0.001$) were empirically associated with customers' perceived food safety.

Discussion and conclusion

This research investigated the role of perceived food safety on customer trust and its mechanism via perceived risk of the food delivery business in Bangkok during the COVID-19 outbreak. The research findings showed that perceived food safety promoted customer trust directly and indirectly by reducing perceived risk.

Finally, the findings presented that perceived food safety positively impacts customer trust. Perceived food safety's positive effect on customer trust is in line with prior studies by Mittendorf and Ostermann (2017) that retail stores' customers in Istanbul, Turkey feel more trust when they perceive a higher degree of food safety and healthiness. In the food delivery context, customers' high level of food safety would create a decent experience and make them feel confident and trust in the food carried by the delivery company and tend to repeat their support to the company.

According to the results, perceived food safety was negatively associated with perceived risk, concurrent with prior research (Rossi et al., 2017; Shim & You, 2015; Yu et al., 2018). In the context of food delivery service in Bangkok, customers who perceive more food safety tend to perceive less risk to their health.

The findings also indicated that perceived risk harmed customer trust. Nguyen and Huynh (2018) found that received risk negatively impacts customer trust of e-payments in Ho Chi Minh City, Vietnam. The impact is concurrent with prior research (Marriott & Williams, 2018; Mittendorf & Ostermann, 2017). In this context, customers with a high perceived risk

level tend to have low trust in a food delivery company. This may be because perceived risk makes customers feel uncertain about delivered food that may cause them illness, making them view food delivery companies as less trustworthy.

Lastly, the results demonstrated that perceived risk partially mediates between perceived food safety and customer trust. This mechanism can explain that, even though customers' high level of perceived food safety can directly create trust in food delivery companies, it can lower their perceived risk to their health and successfully build their trust.

Considering the effects of control variables, female customers seem more sensitive to food safety issues than male customers. Young customers tend to pay more attention to food safety issues than older ones, and customers with higher income tend to focus on food safety more than those with lower income. Lastly, customers with higher education tend to care more about food safety.

Academic contributions

The research's findings provide new knowledge in food safety and customer trust study fields since both concepts, particularly in the light of the social exchange theory concept, have never been investigated in the food delivery business context. Also, their association and the mechanism behind their relationship have never been empirically examined. The results also provide new knowledge and evidence of the mediating role of perceived risk on the relationship between customer perceived food safety and customer trust.

Practical contributions and suggestions

Besides, the research findings provide practical contributions to food delivery companies' management, restaurants providing their food delivery service, and other stakeholders, such as participating restaurants, to cooperate with qualified service providers who professionally provide high food safety standards. Managers can use this research's results to improve their service, develop competitive advantages and enhance their delivery service, particularly during the COVID-19 pandemic where dine-in service is still limited. Many people are scared to dine out in a restaurant. According to the results, managers are suggested to pay much more attention to the prevention of food, such as for example, proper food temperature and contamination, and provide their employees with food safety knowledge and training. Support their employees to undertake food safety courses or programs for certificates. Also, enact strict policies, rules, and regulations controlling employees' practices as professional food handlers. Regularly monitor and provide their employees with clean, and good-conditioned uniforms, and equipment. Ensure quality communication channels with customers. Always obtain customer feedback and take serious actions when a problem is detected. Promote food safety as a business feature. These are supposed to make customers perceive a minimal level of risk, gain their confidence, and eventually promote their trust in food delivery companies and restaurants.

Limitations and recommendations for future studies

Even though this research contributes to various new knowledge and evidence supporting the existing related literature, especially in the food delivery and restaurant industry, there are still some limitations. First, the data were collected from only ten samples for each district that may not be a good representative of others in the same district, limiting the findings' generalizability. A future study is suggested to increase each district's sample size or study each district separately because each has different characteristics. Secondly, this research collected only cross-sectional data, so the ability to analyze and identify causal relationships and directions were limited. Hence, the findings could only be interpreted regarding association but not causation. A future study is suggested to plan a more extended period for data collection. Finally, the self-administered survey used in the research may have caused a subjective bias in the results. Future research is suggested to collect data from various sources and other stakeholders to vary the data sources.

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