

ORIGINAL ARTICLE

Food Safety Compliance During Food Delivery: Food Riders Knowledge, Attitude, and Risk Perception

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ABSTRACT

Introduction: The prevalence of online food delivery service (OFDS) environments in many food service and retail contexts has an impact on how people order and access meals, that led to the emergence food delivery riders, whose numbers have increased significantly, particularly in Kuala Lumpur, Malaysia. However, there are challenges for OFDS providers in evaluating food safety and cleanliness to ensure that clients receive safe and high-quality meals. Therefore, the purpose of this study was to examine the food safety compliances among food riders in Kuala Lumpur.

Materials and methods: The Google Forms platform was used to conduct a quantitative e-survey. The data from 132 Kuala Lumpur food riders was then evaluated using a descriptive statistic, followed by correlation and multi-regression using the SPSS 26 edition. **Results:** Male food riders make up the majority of Grabfood's workforce in Kuala Lumpur (64%) and are more likely to have completed a food handling course and received typhoid vaccinations (20.5%) than female riders. The results also showed a significant positive link between food safety practices among the food riders in Kuala Lumpur for all three variables: food safety knowledge (FSK, $r=0.845$, $p0.001$), food safety attitude (FSA, $r=0.832$, $p0.001$), and risk perception (RP, $r=0.774$, $p0.001$). All three of the aforementioned components accounted for 76.5% of the variation ($R^2 = 0.770$, $F(3,131) = 143.00$, $p = 0.010$). **Conclusion:** To summarise, the majority of food riders have solid food safety knowledge, attitudes, and risk perception, and they follow best practices

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INTRODUCTION

The rapid expansion of online food delivery services (OFDS) has disrupted the offline restaurant industry (1). Chai and Yat explain that many people favour food delivery because it enables them to have access to fresh, healthy food at their offices or residences while continuing to work (2). In Malaysia, there are numerous food delivery companies, many of which offer online food delivery services.

OFDS are gradually but undoubtedly changing the food and beverage industry due to their capacity to increase revenue, guarantee higher employee efficiency, fulfil precise orders, and build sizable client databases (3). Despite not being as popular as alternative methods

of placing a meal order, OFD users are continuously growing (4). In Malaysia, there are numerous companies that offer meal delivery services, including FoodPanda, DeliverEat, Uber Eats, Grab meal, Lalamove, Honestbee, and Running Man Delivery (5).

Even though the platform economy has the ability to create jobs, it faces problems like low pay, no social security, and digital monitoring that makes jobs less secure. The COVID-19 pandemic and the lockdowns that followed have made food delivery workers even more vulnerable, leading to unemployment, lower earnings, increased health risks, social exclusion, and job stress (6,7).

Furthermore, there has been an increase in concern about the procurement of raw materials for food preparation and the safety evaluation of restaurant partners (8). Online food ordering organisations should prioritise openness in the food delivery process by enhancing information about the safety safeguards in place across the entire value chain (9). This guarantees

that critical information reaches clients quickly, while also allowing businesses to remain competitive in a highly competitive field.

The assessment and examination of the knowledge, attitude, and practise (KAP) of food runners with regards to safety are crucial in advancing the delivery of sanitary and nourishing food to patrons. The examination of Knowledge, Attitudes, and Practises (KAP) is of utmost importance for evaluating the efficacy of programmes related to nutrition education and communication (10). Based on the Knowledge-Attitude-Practice (KAP) theory, the evaluation of food delivery workers will encompass three fundamental elements: their comprehension of food safety principles, their disposition towards food safety, and their practical implementation of measures to uphold food safety standards. The achievement of a positive outcome in all of these aspects indicates the effective execution of a strong food safety system by the food delivery personnel, resulting in the provision of safe food to consumers.

The study employed a research framework based on an extended Knowledge, Attitude, Risk Perception, and Practices (KAP) model (11). The extended Knowledge, Attitude, and Risk Perception (KAP) model encompasses key factors that serve as variables influencing the food safety and hygiene practises of food riders during the process of food delivery.

Therefore, the objective of this research is to elucidate the significance of implementing knowledge, attitudes, and practises (KAP) in the evaluation of food delivery riders, specifically in relation to the domains of food safety and cleanliness.

MATERIALS AND METHODS

This research was conducted quantitatively. A cross-sectional design using a web-based survey based on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The Likert scale was chosen for its ability to capture nuanced responses and provide quantitative data on participant perceptions (12) was utilised to investigate the state of level of compliance of food safety Knowledge, Attitude, Risk Perception and Practices among food riders in Kuala Lumpur, Malaysia. The survey was disseminated via many social media sites that are connected to the respondents, including the official GrabFood Rider Community Malaysia and FoodPanda Riders Community Malaysia of the affiliated branch. The data were then analysed via the Statistical Package for the Social Sciences (SPSS) Version 26 software, following the acquisition of 132 valid questionnaire responses through the utilisation of online Google Forms. To analyses and develop the findings, a reliability analysis was performed, followed by descriptive, correlation and multi regression analyses.

Ethical Clearance

This study was approved by Universiti Teknologi MARA (UiTM) Branch Ethics Research Committee (BERC) with approval code BERC/6/2023 (UG/MR/184).

RESULTS

Reliability Analysis

The internal consistency of items during the reliability test was assessed using Cronbach’s alpha value (13). According to Nunnally, it was posited that an alpha coefficient of 0.6 would be satisfactory for the initial phases of study (13). The Cronbach’s alpha ratings obtained in this study were above the threshold of 0.6 which range from 0.945 to 0.981, suggesting that all the items demonstrated satisfactory reliability and can be utilized to conduct additional hypothesis testing.

Factors Influencing the Food Riders’ Food Safety Practices

The link between food safety knowledge, food safety attitude, risk perception towards food safety practices among food riders in Kuala Lumpur is presented in Table I below. All variables showed strong positive correlation as followed, food safety knowledge (FSK, r=0.845, p0.001), food safety attitude (FSA, r=0.832, p0.001), and risk perception (RP, r=0.774, p0.001).

Table I: Pearson’s Correlation Coefficients Among Variables Related to Food Safety Compliance, Knowledge, Attitudes, and Risk Perceptions of Food Delivery Riders in Kuala Lumpur

		Food Safety Knowledge (FSK)	Food Safety Attitude (FSA)	Risk Perception (RP)	Intention to Practice Food Safety (IPS)
FSK	Pearson Correlation	1	0.857**	0.836**	0.845**
	Sig. (1-tailed)		<.001	<.001	<.001
	N	132	132	132	132
FSA	Pearson Correlation	0.857**	1	0.735**	0.832**
	Sig. (1-tailed)	<.001		<.001	<.001
	N	132	132	132	132
RP	Pearson Correlation	0.836**	0.735**	1	0.774**
	Sig. (1-tailed)	<.001	<.001		<.001
	N	132	132	132	132
IPS	Pearson Correlation	0.845**	0.832**	0.774**	1
	Sig. (1-tailed)	<.001	<.001	<.001	
	N	132	132	132	132

** Correlation is significant at the 0.01 level (1-tailed Pearson).

Predictors of Food Safety Compliance: A Multiple Regression Analysis

The study utilized multiple regression analysis to assess the extent to which compliance with food safety

practices among food delivery riders in Kuala Lumpur is predicted by their knowledge, attitudes, and risk perception as shown in Table II below.

Table II: Multiple Regression Analysis of Food Safety Knowledge, Attitudes and Risk Perception on Food Safety Practices Among Food Delivery Riders in Kuala Lumpur

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.845 ^a	0.714	0.712	0.26616	0.714	324.637	1	130	<.001
2	0.871 ^b	0.758	0.754	0.24571	0.044	23.531	1	129	<.001
3	0.878 ^c	0.770	0.765	0.24039	0.012	6.771	1	128	.010

Predictors: (Constant), Food Safety Knowledge (FSK)

a. Predictors: (Constant), Food Safety Knowledge(FSK), Food Safety Attitude (FSA)

b. Predictors: (Constant), Food Safety Knowledge(FSK), Food Safety Attitude (FSA) Risk Perception (RP)

c. Dependent Variable: Intention to Practices Food Safety (IPS)

DISCUSSION

The demographic profile provides valuable insights into the characteristics of food delivery riders in Kuala Lumpur. A significant proportion of food delivery riders employed by Grabfood are male, comprising 64% of the total. The predominance of male riders reflects broader gender trends in the gig economy, where men often dominate delivery service roles due to various socioeconomic factors (14). Furthermore, a majority of these riders have undergone the food handling training, but a smaller percentage, specifically 20.5%, have received a typhoid shot. The low rate of typhoid vaccination among riders raises significant public health concerns, given their direct involvement in handling and delivering food to consumers (15). Research underscores the importance of vaccination coverage to mitigate foodborne illness risks, indicating a need for targeted health interventions within food delivery services. Furthermore, a significant majority of the individuals engaged in food delivery services are employed on a part-time basis, comprising around 79% of the workforce. Moreover, the prevalence of part-time employment among food delivery riders highlights the flexible nature of gig economy jobs but also raises issues of job security, benefits, and income stability (16). Part-time employment in the gig economy may contribute to financial vulnerability and limited access to social protections, necessitating further examination of economic conditions and welfare among these workers (17). These workers typically earn an average monthly wage ranging from RM2001 to RM3000. Furthermore, the average monthly earnings among food delivery riders in Kuala Lumpur underscore their socioeconomic status and economic contributions. However, disparities in income distribution within this range may impact overall financial well-being and job satisfaction among riders (18).

Recent studies advocate for improving health and safety measures, enhancing job conditions, and addressing financial stability for gig workers in urban settings (19).

Future research could explore strategies to enhance vaccination uptake among food delivery riders,

The correlation coefficient as shown in Table I above, for food safety knowledge has a strong positive correlation suggests that food riders who possess greater knowledge about food safety practices are more likely to implement these practices effectively. Knowledge about safe food handling, storage, and hygiene practices is crucial in preventing foodborne illnesses and ensuring the safety of delivered food. This finding aligns with previous research indicating that education and training in food safety significantly enhance compliance with safety protocols (20). It underscores the importance of comprehensive training programs for food delivery riders to ensure they are well-informed about the critical aspects of food safety.

While the strong positive correlation for food safety attitude indicates that riders who hold positive attitudes towards food safety are more likely to engage in safe food handling practices. Attitudes towards food safety reflect the riders' beliefs and values regarding the importance of maintaining high standards of hygiene and safety in their work. Positive attitudes can be fostered through continuous education, reinforcement of the significance of food safety, and recognition of good practices. Studies have shown that when individuals understand the benefits of food safety and believe in its importance, they are more likely to adhere to safety guidelines (21).

Further, the strong positive correlation of risk perception (RP, $r=0.774$, $p<0.001$) signifies that riders who perceive higher risks associated with food safety violations are more diligent in practicing safe food handling. Risk perception involves recognizing the potential consequences of neglecting food safety measures, such as foodborne illnesses or customer dissatisfaction. Higher risk perception motivates food riders to prioritize safety practices to mitigate these risks. This finding is consistent with research suggesting that individuals who

are aware of the potential hazards and consequences are more likely to adopt precautionary measures (22).

A multiple regression analysis to assess the extent to which compliance with food safety practices among food delivery riders in Kuala Lumpur is shown in Table II. The results of the regression analysis are quite revealing, with the model explaining 76.5% of the variance in food safety compliance ($R^2 = 0.770$, $F(3,131) = 143.00$, $p < 0.001$). This high R^2 value indicates a strong predictive relationship between the independent variables (knowledge, attitude, and risk perception) and the dependent variable (compliance with food safety practices).

The substantial R^2 value suggests that knowledge, attitudes, and risk perception are significant determinants of food safety compliance. This finding aligns with existing literature, which emphasizes that well-informed individuals with positive attitudes towards food safety and a high perception of related risks are more likely to adhere to safe practices (18,21). The strong predictive power of these variables underscores the importance of targeted educational and training programs to enhance food safety compliance among food riders.

Food safety knowledge was found to be a crucial predictor of compliance. This aligns with studies that indicate individuals with higher knowledge levels are better equipped to implement safety practices (21). Knowledgeable riders are likely more aware of the consequences of unsafe food handling, which motivates adherence to proper procedures. Therefore, increasing food safety knowledge through comprehensive training programs can significantly improve compliance.

Attitude towards food safety also emerged as a significant predictor. This finding is consistent with the theory of planned behavior, which posits that positive attitudes towards a behavior increase the likelihood of its execution (18). Riders who value food safety and understand its importance are more inclined to follow safe practices. Interventions that foster positive attitudes towards food safety, perhaps through motivational incentives and highlighting the benefits of compliance, could further enhance adherence.

Risk perception's role as a significant predictor highlights the importance of riders understanding the risks associated with non-compliance. Riders who perceive higher risks related to food safety violations are more cautious and diligent in their practices. This finding supports previous research that links risk perception with precautionary behavior (22). Enhancing risk perception through realistic risk communication and case studies of foodborne illness outbreaks could therefore be an effective strategy to improve compliance.

In conclusion, the multiple regression analysis highlights

the significant role of knowledge, attitude, and risk perception in predicting food safety compliance among food delivery riders in Kuala Lumpur. By addressing these factors through targeted interventions, it is possible to improve food safety standards in the food delivery industry, thereby protecting public health and ensuring consumer trust.

CONCLUSION

Food safety is an essential component of the food industry, encompassing the proactive measures taken to mitigate the occurrence of foodborne illnesses and minimise the hazards connected with the consumption of food. The food rider's responsibility to ensure the prevention of potential contamination, this study suggests the potential factors that may impact the quality of the consumer's food and beverages. The use of the Knowledge, Attitude, and Practise (KAP) theory enables the assessment of the necessity to develop customised food safety protocols within the academic and industrial domains. Furthermore, the OFDS sector has the capacity to provide the protection of its personnel and customers against a range of potential risks that may occur during their activities.

For the future research could explore the long-term impact of enhanced training programs on food safety compliance. Longitudinal studies could provide insights into how sustained education affects compliance over time. Additionally, research could investigate other potential predictors of compliance, such as organizational culture and support, to develop a more holistic understanding of the factors influencing food safety practices among food delivery riders.

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