

Two phases of online food delivery app users' behavior in Greater Jakarta during the second year of the COVID-19 pandemic: Perceptions of food safety and hygiene

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Abstract

Background: The ongoing COVID-19 pandemic affects several aspects of food safety and food delivery hygiene for online food delivery applications (OFDAs). Several previous studies conducted at various times during the COVID-19 pandemic have yielded interesting results. This study aimed to determine and analyze whether perceptions of food safety and food delivery hygiene are short-term and long-term predictors of behavioral intention to use OFDAs.

Methods: A quantitative approach and structural modeling were used in this study. SmartPLS is used to analyze five direct and two mediating effects of the variables used in this study. The data sample consists of OFDA users in Greater Jakarta during the second year of the COVID-19 pandemic.

Results: Perceived food safety has a significant effect on behavioral intention to use these applications but does not affect behavioral intention to continue using these applications. Perceived food delivery hygiene does not influence using these apps for either short-term or long-term behavioral purposes. Experience with these apps related to food safety and food delivery hygiene during a pandemic can be indicative of their long-term viability. The mediating effect of behavioral intention to use on behavioral intention to continue using these apps affects perceived food safety but not food delivery hygiene.

Conclusion: By emphasizing vaccination and boosting against COVID-19, providing hand sanitizer, and preserving the cleanliness and integrity of food packaging, the findings of this study can be put into practice towards the sustainable usage of OFDAs.

Keywords: Food safety, Food hygiene, Food packaging, COVID-19 pandemic, SARS-CoV-2

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Introduction

Online food delivery applications (OFDAs) are smartphone-based applications that allow users to search for restaurants and food, place orders, and pay for their food (1). OFDAs are thought to make online food purchases more efficient and less time-consuming (2). The online food purchasing and delivery industry has grown in line with the advancement of information technology (3,4). This industry has been studied and referred to using various terminology, including mobile food delivery apps (5), mobile food ordering apps (1), online food delivery

services (6), and online food delivery app (7). Today, the presence of these applications is no different from the presence of other social networks, which can lead to socio-psychological elements of society, one of which is reflected in attitudes or purchasing decisions (8,9). In Greater Jakarta, several OFDAs such as GrabFood, GoFood, and ShoppeFood are extremely popular. The COVID-19 pandemic has impacted people's food consumption habits (10). It has also impacted environmental health and hygienic behavior, such as increased attention toward disinfectant usage (11) and cleanliness of surfaces and



personal equipment (12-15). This implies that food purchase intentions during the pandemic are strongly influenced by current conditions, such as food safety concerns and food delivery staff hygiene concerns. As a result, OFDAs may present a solution to the issue of food availability during the pandemic.

Several studies have found inconsistent results concerning food-related safety and hygiene issues with OFDA use during the current pandemic (5,6,16,17). Many factors influence food safety in general (18). Food safety is frequently associated with service standards in implementing pandemic health protocols, such as the use of protective face masks or alcohol-based cleaning solutions (19,20). Furthermore, the use of OFDAs is determined by community behavior, which can change quickly. A change in this behavior is especially noticeable when there are concerns regarding food safety or the cleanliness of food delivery personnel during a pandemic. Khan et al (21) describe food safety and food hygiene guidelines for food product providers and customers, as shown in Figure 1. Several parts of the guidelines are relevant to OFDA conditions in Jakarta, Bogor, Depok, Bekasi, and Tangerang (Greater Jakarta) in general, such as paying attention to personal hygiene (appearance of equipment for food delivery workers according to the health protocols) and imposing restrictions on social services (instructions indicating whether the food will be given directly to the customer, left at a security desk, or left at the customer's door).

An increase in the number of COVID-19 cases in a region may alter attitudes toward the use of OFDAs. Since early in the pandemic, there has been evidence that the SARS-CoV-2 virus can survive on surfaces for several days. According to the report of the Centers for Disease Control and Prevention (CDC) (22), there have been several new SARS-CoV-2 variants of concern during this pandemic (Table 1). These facts trigger people's anxieties about ordering food online. Thus, it is necessary to investigate

the public's short- and long-term behavior toward the use of OFDAs, as measured by their perceptions of food safety and food delivery hygiene. The present study aimed to identify and analyze the behavioral determinants of the sustainability of online food purchasing during a pandemic using the variables of perceived food safety, perceived hygiene of food delivery, and behavioral intention to use. This study will also determine whether behavioral intent to use acts as a mediator of perceived food safety and perceived hygiene of food delivery. This study hopes to demonstrate that OFDA use can be altered by focusing on food safety and food delivery hygiene. The pandemic research period, when people's concerns about COVID-19 begin to fade, is also expected to reveal a new side of color, particularly when it comes to measuring important things like how people act.

Using two phases of OFDA usage behavior and the second year of the COVID-19 pandemic as a sample period is a novel aspect of this study. Since the COVID-19 pandemic has not completely subsided, using this sample period will provide insight into whether the public still considers the food safety and food hygiene aspects of OFDAs to be important. In addition, these results can be used to supplement research on how the public felt about food safety and hygiene at various times during the pandemic.

Hypothesis development

The concept of food safety can be explained by consumer perceptions of food safety concerns such as food safety in packaging, food safety procedures, and food hygiene (16). Substandard food safety can endanger consumers' health in certain circumstances (17). This viewpoint is consistent with the results reported by Nyawo et al (23). They reported that food safety is closely related to the burden of public health and economic conditions on long-term impacts. Food safety is a major public concern, especially during the COVID-19 pandemic when the

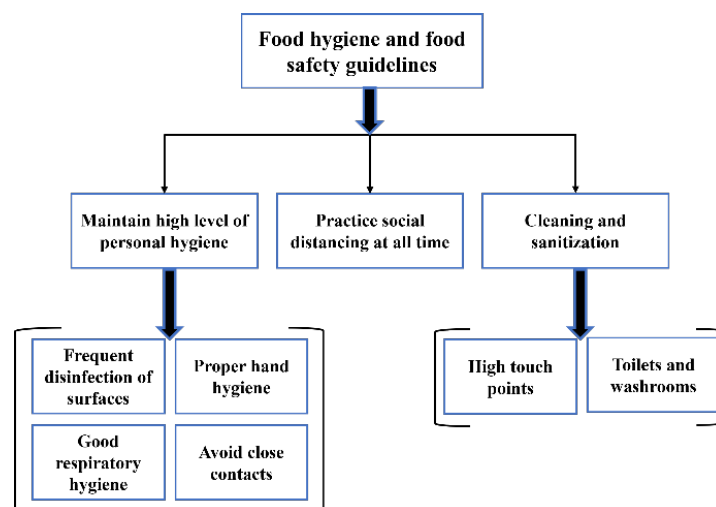


Figure 1. Food hygiene and safety guidelines

Table 1. SARS -CoV2 variants

The WHO Label	Pango lineage	Date of designation
α (Alpha)	B.1.1.7 and Q lineages	VOC: December 29 th , 2020 VBM: September 21 st , 2021
β (Beta)	B.1.351 and descendent lineages	VOC: December 29 th , 2020 VBM: September 21 st , 2021
γ (Gamma)	P.1 and descendent lineages	VOC: December 29 th , 2020 VBM: September 21 st , 2021
δ (Delta)	B.1.617.2 and AY lineages	VOC: June 15 th , 2021 VBM: April 14 th , 2022
ε (Epsilon)	B.1.427 B.1.429	VOC: March 19 th , 2021 VOI: February 26 th , 2021; June 29 th , 2021 VBM: September 21 st , 2021
η (Eta)	B.1.525	VOI: February 26 th , 2021 VBM: September 21 st , 2021
ι (Iota)	B.1.526	VOI: February 26 th , 2021 VBM: September 21 st , 2021
κ (Kappa)	B.1.617.1	VOI: May 7 th , 2021 VBM: September 21 st , 2021
N/A	B.1.617.3	VOI: May 7 th , 2021 VBM: September 21 st , 2021
ζ (Zeta)	P.2	VOI: February 26 th , 2021 VBM: September 21 st , 2021
μ (Mu)	B.1.621, B.1.621.1	VBM: September 21 st , 2021

VOI, Variant of interest; VBC, Variant being monitored; VOC, Variant of concern.

public has become more aware of the dangers of SARS-CoV-2 exposure. People are less likely to buy food from a location if there are indicators or cases of food safety problems. Roh and Park (24) discovered that people, particularly Asians, were very concerned about food safety inspections and violations, even though the food was eventually found not to be a source of SARS-CoV-2 infection (25). People also express concerns regarding the safety of manufactured food (17). Another example is that health risks are not spared in foods commonly consumed by humans may come with health risks due to contamination or manufacturing processes; rice may contain cadmium, lead, and arsenic (26), and salted fish may suffer from quality assurance issues due to the questionable safety of the salting process (27). According to the study of Al Amin et al (16), there is a link between food safety and customer behavior when purchasing food online. They also stated that if an OFDA is deemed safe, consumers will continue to use the application. This indirectly explains the opposite effect; thus, more research is needed to demonstrate that, in addition to food safety concerns during a long pandemic, behavioral intentions to use OFDAs are influenced by food safety perceptions. As a result, the following hypotheses are proposed:

H1: The perception of food safety has a significant impact on behavioral intention to use.

H2: The perception of food safety has a significant impact on continuance behavior.

According to the study by Nyawo et al (23), food

hygiene is associated with clean and sanitary cooking facilities and utensils. This study defines food delivery hygiene as the cleanliness of food delivery. This demonstrates the safe and sanitary food delivery services of food delivery personnel (16). Food must be served with a consistent level of food safety and hygiene because a lack of cleanliness from the kitchen to delivery is common (28), where delivery service is one of the most important factors in maintaining consistency of service quality (29). This is also consistent with the notion that good service quality can lead to satisfied users (30). According to the report of the French Agency for Food, Environmental, and Occupational Health and Safety (ANSES), which was emphasized in the research of Cable et al (25), the process of cooking food itself can aid in the inactivation of SARS-CoV-2. Maintaining consistent hygiene in food delivery has become more difficult during the COVID-19 pandemic. Health protocols must be implemented and followed in accordance with food delivery standard operating procedures. Furthermore, consumer expectations regarding the hygienic appearance of food delivery vary greatly. This is another reason why a health protocol process is required to meet food delivery hygiene service standards. However, differences in customer perceptions and expectations frequently influence the decision to use OFDAs in the short- and long-term, as well as on an ongoing basis. This serves as the foundation for the following hypotheses:

H3: The perception of food delivery hygiene has a significant impact on behavioral intention to use.

H4: The perception of food delivery hygiene has a significant impact on continuance behavior.

Behavioral intentions are highly likely to influence the long-term use of technology applications (31). Lee et al (32) explained that people's behavior can influence their next phase of usage (i.e., the long-term intention to use). The prolonged COVID-19 pandemic may impede the formation of intentions to use OFDAs indefinitely if conditions or perceptions about food safety or food delivery hygiene deteriorate. Thus, the following hypothesis is proposed:

H5: Behavioral intention to use has a significant impact on continuance behavior.

As previously stated, there is a link between public perceptions of food safety and food delivery hygiene and behavioral intentions to use OFDAs in the short and long term. The use of these applications is heavily influenced by community behavior (33), both for low and high frequency of use (34). These OFDA service providers continue to adapt their services to the public's conditions and preferences. This becomes important in determining the level of customer loyalty required to continue using OFDAs. Forming an intention to use an application and maintaining consistent OFDA usage behavior are difficult, especially during a pandemic. An application's

ease of use influences customer purchasing decisions (35). Based on this information, the following hypotheses are proposed:

H6: The perception of food safety mediated by behavioral intention to use has a significant impact on continuance behavior.

H7: The perception of food delivery hygiene mediated by behavioral intention to use has a significant impact on continuance behavior.

Materials and Methods

Data for this quantitative study were collected through a random distribution of online questionnaires. Participants were asked to give consent before filling out the questionnaires, and they were given the option to quit at any moment if a question made them feel uncomfortable. Participants were also asked if they were in good health status at the time of filling out the questionnaire and could continue to do so. As a result, participants in this study may be involved. No data were collected that could be used to identify a specific individual and all data were kept anonymous.

The instrument for this study, as shown in Figure 2, was developed using three exogenous variables and one endogenous variable. The exogenous variables are the perception of food safety, food delivery hygiene, and behavioral intention to use (employed as the mediator variable); and the endogenous variable is continuance behavior. Al Amin et al (16), Tran (5), and Wang & Tsai (9) developed the food safety perception variable, which includes three elements, feeling buying food online during a pandemic is safe, feeling buying food online is sanitary, and feeling buying food online is hygienic. The food delivery hygiene variable was adapted from Isoni Auad et al (36) and Tran (5) and consists of four elements, feeling relieved when a food delivery worker wears gloves, feeling relieved when a food delivery worker wears a mask, feeling relieved when a food delivery worker wears a head covering, and feeling more comfortable when a food delivery worker takes care to keep food packaging clean and undamaged. The behavioral intention variable

includes four elements, recommending online food purchases to others during the pandemic, attempting to continue buying food online during the pandemic and continuing to buy food online even for special events/activities (37). The continuance behavior variable was adopted from Alalwan (1), Al Amin (16), and Tran (5) and includes four elements, whether it is possible to order food online during the pandemic, hoping to be able to continue buying food online, purchasing food online regularly, and purchasing food online while considering the cleanliness of the restaurant's kitchen.

Figure 3 depicts the stages of determining criteria, testing, and analyzing this study. The inclusion criterion for this study was OFDA users in Greater Jakarta during the COVID-19 pandemic. The first question on the questionnaire was designed to ensure that all participants evaluated in this study lived in Greater Jakarta. Because the study's total population is unknown, the sample size was determined by multiplying the number of items (15 questionnaire statements) by 5 (for the minimum sample size) and 10 participants (for the maximum sample size) (38-41). Following the collection of questionnaires from participants, 105 participants met the criteria for research samples. This became the sample size and met the minimum sample size. This study used PLS-SEM on SmartPLS for structural model analysis. First, reliability and validity tests were conducted. The reliability test for this study required that both composite reliability (CR) and Cronbach's alpha (CA) were greater than 0.7 (42). The validity of this study used an outer loading (OL) result greater than 0.7 and an average variance extract (AVE) result greater than 0.5 (43). The discriminant validity of this study was based on the fact that the construct correlation value was higher than the correlation value with other constructs. The hypothesis was tested in this study using results with a *P* value less than 0.05 (44).

Results

Profile of participants

Table 2 shows the profile distribution of the study participants. More than 60% of the participants were

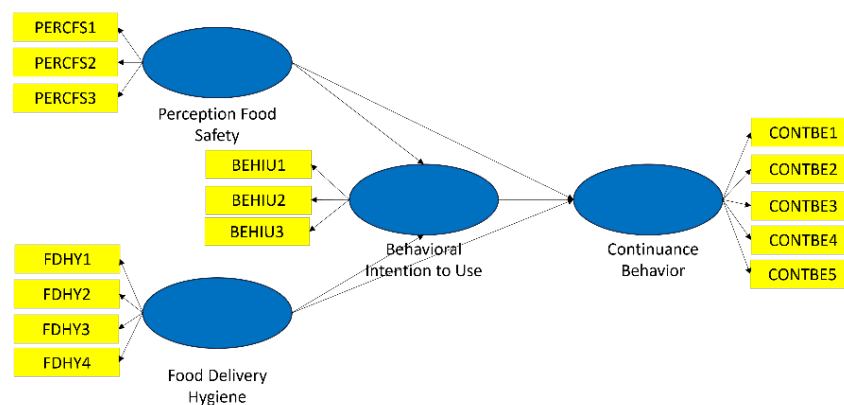


Figure 2. Research framework

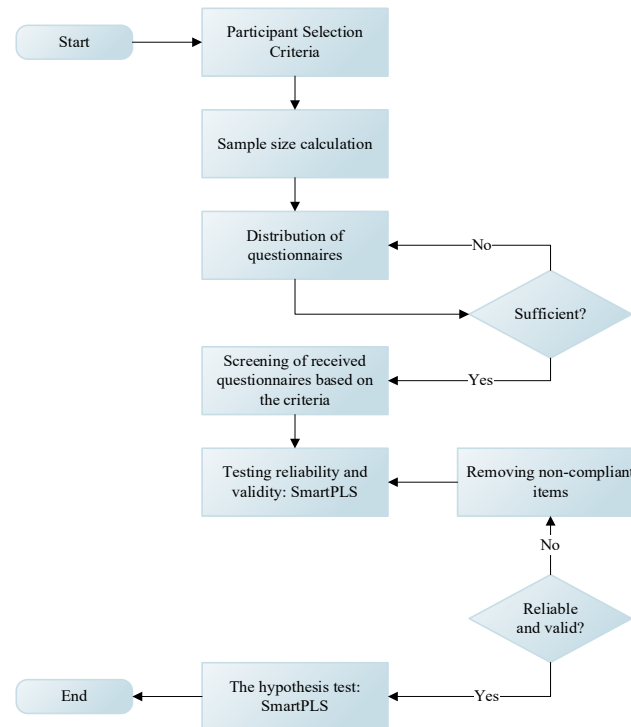


Figure 3. Testing and research analysis stages

female. Approximately 61% of the participants were older than 49 years old. Those aged 20 to 39 years were the next largest group of participants. In terms of occupation/profession, 30% of participants were self-employed and over 20% of participants were students. More than 67% of survey respondents had a bachelor's degree and approximately 23% had a master's degree. Over 36% of survey participants purchased food online two to three times per week, and nearly 36% did so weekly. Gofood and GrabFood were the most popular OFDA service providers. More than 43% of respondents used Gofood, while 38% used GrabFood, which was dominant in this survey. Over 97% of participants used cashless payment methods, illustrating participants' awareness of cashless payment options for online food purchases during the pandemic.

PLS algorithm

Table 3 displays the results of the reliability and validity tests. CA and CR are both greater than 0.7 for all four variables. Perception of food safety yields a CA of 0.815 and a CR of 0.883. The CA and CR for perceptions of food delivery hygiene are 0.74 and 0.85, respectively. Behavioral intention to use OFDAs yields CA and CR results of 0.887 and 0.930, respectively. Continuance behavior toward OFDAs yields a CA of 0.887 and a CR of 0.921. The validity of the AVE results was also investigated in this study, where the value must be greater than 0.5. The AVE values for the perception of food safety and food delivery hygiene are 0.716 and 0.748, respectively. Figure 4 presents the OL results for all items in each variable in the

study with $OL > 0.7$.

Coefficient of determination

Table 4 displays the coefficient of determination results from this study. The R-squared result for the behavioral intention to use variable is 0.235, indicating that the perception of food safety and food delivery hygiene used in this study successfully explains 23.5% of the effect on behavioral intention to use. The value of R-squared on the continuance behavior variable is 0.520, which explains 52% of the variance in continuance behavior using the perception of food safety, food delivery hygiene, and behavioral intention to use variables.

Hypothesis testing

Table 5 shows the results of the hypotheses testing. The path from the perception of food safety to behavioral intention to use has a P value of 0.000 ($P < 0.05$). These findings indicate that the perception of food safety has a significant impact on behavioral intention to use; thus, H_1 is accepted. The path from the perception of food safety to continuance behavior has a P value of 0.637 ($P > 0.05$). These findings indicate that the perception of food safety does not affect continued behavior; thus, H_2 is rejected. The path from food delivery hygiene to behavioral intention to use has a P value of 0.279 ($P > 0.05$), indicating that the perception of food delivery hygiene does not affect behavioral intention to use; thus, H_3 is rejected. The path from food delivery hygiene to continuance behavior has a P value of 0.549 ($P > 0.05$). This indicates that the perception of food delivery hygiene does not affect

Table 2. Distribution of participant's profile

Profile	Frequency	Percent
Gender		
Female	63	60
Male	42	40
Age (y)		
< 20	1	0.95
20-29	28	26.67
30-39	8	7.62
40-49	4	3.81
>49	64	60.95
Job/Profession		
Medical doctor	13	12.38
Private sector employee	32	30.48
Government employees	2	1.90
Entrepreneur	17	16.19
Housewife	16	15.24
Students	23	21.90
Others	2	1.90
Educational background		
Elementary school to high school	5	4.76
Diploma	5	4.76
Bachelor	71	67.62
Master	24	22.86
Frequency of buying food online during the pandemic (an average of a week)		
Once	37	35.24
Twice to three times	38	36.19
Four to five times	19	18.10
Six to seven times	3	2.86
More than seven times	8	7.62
The most frequently used online food purchasing application		
Gofood	46	43.81
Grabfood	39	37.14
Shopeefood	20	19.05
The payment method most frequently used when purchasing food online		
Cashless	102	97.14
Cash	3	2.86

Table 3. Reliability and validity test

Variable	CA	CR	AVE	Discriminant validity			
				PERCFS	FDHY	BEHIU	CONTBE
Perception food safety	0.815	0.883	0.716	0.846	-	-	-
Food delivery hygiene	0.745	0.853	0.748	-	0.865	-	-
Behavioral intention to use	0.887	0.930	0.816	-	-	0.903	-
Continuance behavior	0.887	0.921	0.746	-	-	-	0.864

PERCFS, Perception food safety; FDHY, Food delivery hygiene; BEHIU, Behavioral Intention to use; CONTBE, Continuance behavior; CA>0.7; CR>0.7; AVE>0.5.

continued behavior; thus, H_4 is rejected. The path from behavioral intention to use to continuance behavior has a P value of 0.000 ($P < 0.05$), indicating that behavioral intention to use has a significant impact on continued behavior; thus, H_5 is accepted. Behavioral intention to use mediates the effect of food safety on continued behavior because of $P = 0.001$ ($P < 0.05$); therefore, H_6 is accepted. The P value for the path of food delivery hygiene to behavioral intention to use to continuance behavior is 0.282, indicating that the effect of the perception of food delivery hygiene on continued behavior is not mediated by behavioral intention to use; thus, H_7 is rejected.

Discussion

The results of this study indicate that the perception of food safety has a significant impact on behavioral intention to use. These findings support research that explains the impact of food safety perception on behavioral intention to use (5,16,17). The ongoing COVID-19 pandemic situation has raised public awareness in the form of an increased perception of food safety when purchasing food online. Figure 5 shows the ordering process for the GrabFood application, which is one of the OFDA players in Indonesia. Customers can observe at least two critical stages of the ordering process in terms of food safety and hygiene. First, there is information from OFDA service providers about delivery workers who have been vaccinated, as well as an appeal to continue following the health protocols. This is an important method of providing customers with a feeling of safety. Second, when the food is delivered to the customer, they can examine the food packaging and determine whether it meets safe, clean, and undamaged packaging standards. Some restaurants provide complimentary food safety accessories such as food seals.

Implementing health protocols is still prevalent today, and it is reflected in the anticipation of being exposed to COVID-19. The most dominant aspect that shapes customer perceptions of food safety is that customers feel safe when purchasing food online during a pandemic. Understandably, there are still concerns about purchasing food directly from restaurants, even though restaurant services during the pandemic were adjusted by adhering to health protocols (45). Cable et al (25) emphasized that food packaging may become contaminated. Hesami

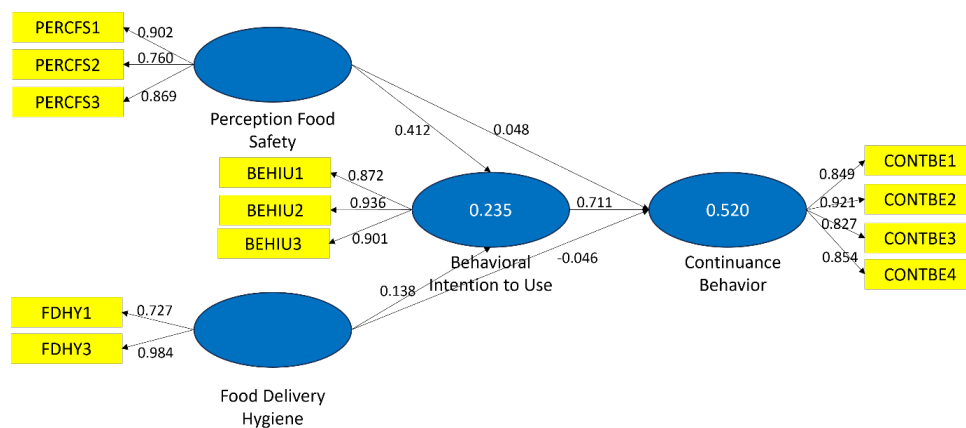


Figure 4. Outer loading

Table 4. Coefficient of determination

Variable	R-squared
Behavioral intention to use	0.235
Continuance behavior	0.520

Arani et al (46) also stated that procedures to prevent the spread of COVID-19 have serious flaws that must be addressed, particularly when disinfectant products are purchased without quality assurance. Thus, the findings of this study highlight that customers prefer to buy food online rather than in a restaurant because they anticipate the continued implementation of health protocols due to concerns about food safety.

This study finds that perceptions of food safety have no effect on subsequent behavior, and is consistent with extant research (5,16), which explains that there is no direct relationship between food safety perception and continued behavior. Other studies, however, offer the opposite result (6). OFDA users in this study appear to have become accustomed to the lengthy COVID-19 pandemic. Health protocols imposed by the OFDA service providers provide customers with a sense of security. As a result, the perception of food safety as still being an important thing that has been and is still being implemented has no direct impact on the continued use of OFDAs. Because this application meets one of the public’s needs, it will continue to be used in the future.

This study also explains that delivery personnel’s hygiene practices do not affect customers’ behavioral intentions to use OFDAs. This result contradicts the findings of Al Amin et al (16) and Tran (5). However, this is understandable considering the circumstances in Jakarta, particularly where the COVID-19 vaccine was administered in large numbers. This is also supported by the OFDA service providers, who always inform customers about the hygiene of delivery workers. Furthermore, people have become accustomed to their self-awareness of the importance of adhering to health protocols. As a result of these three points, the public is less concerned

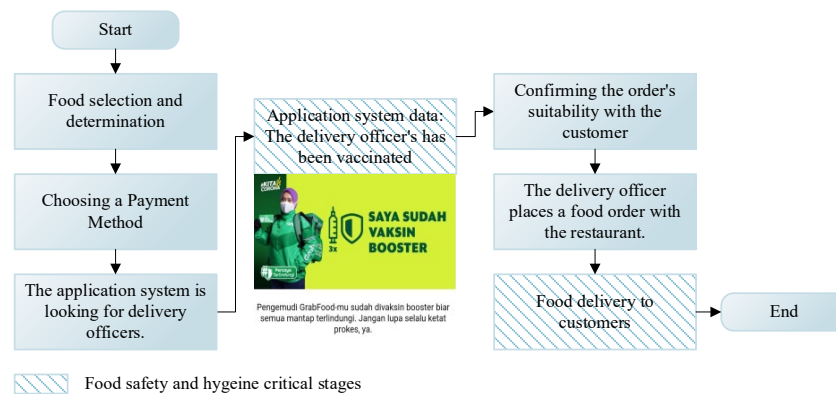
about the issue of delivery personnel hygiene practices when purchasing food online. At the start of the global pandemic, the public considered hygiene for online food delivery workers an important issue and focused on the availability of personal protective equipment such as face masks (19). Although the findings of this study show hygiene factors’ lack of impact on behavioral intentions to use OFDA, the standard for maintaining hygiene aspects that are carried out in accordance with protocols for online food delivery employees have been maintained during the pandemic. Furthermore, OFDAs have now become a tool that assists the public in meeting their daily needs; therefore, the public will continue to use OFDAs during the pandemic.

According to this study, food delivery hygiene has no significant impact on continued behavior. This supports the rejection of the findings of Al Amin et al (16) and Tran (5). People’s concerns about COVID-19 are gradually fading, as various prevention efforts are carried out in accordance with government policies, such as information dissemination through advertisements (47), implementation of health protocols, and administration of the COVID-19 vaccine. People were concerned about hygiene at the start of the pandemic, so it was not uncommon to see food delivery workers carrying alcohol-based sanitizers on their person (20). Another factor to consider is that because this pandemic has continued for an extended period, it has raised public awareness about self-protection through health protocols, particularly regarding hygiene. This is also evident in the policies implemented by the OFDA service providers, who actively support the implementation of health protocol policies for delivery workers. Customers are also informed about these hygiene practices, providing OFDA users with a sense of relief and safety.

Furthermore, the results of this study show that there is a significant influence between behavioral intention to use and continued behavior, with attempting to continue buying food online during a pandemic as the most dominant factor in shaping behavioral intention to use.

Table 5. Hypothesis testing

Path	Standard Deviation	T-Statistics	P value	Remark
Perception of food safety → Behavioral intention to use	0.112	3.689	0.000	H ₁ : Accepted
Perception of food safety → Continuance behavior	0.102	0.473	0.637	H ₂ : Rejected
Food delivery hygiene → Behavioral intention to use	0.128	1.084	0.279	H ₃ : Rejected
Food delivery hygiene → Continuance behavior	0.077	0.600	0.549	H ₄ : Rejected
Behavioral intention to use → Continuance behavior	0.068	10.492	0.000	H ₅ : Accepted
Perception of food safety → Behavioral intention to use → Continuance behavior	0.091	3.231	0.001	H ₆ : Accepted
Food delivery hygiene → Behavioral intention to use → Continuance behavior	0.091	1.076	0.282	H ₇ : Rejected

**Figure 5.** The ordering process of GrabFood

This result corroborates the findings of the study by Tran (5). It is also consistent with the results of the study of Al Amin et al (16), indicating that behavioral intention can form a sustainable purchase from customers. OFDAs appear to benefit from the COVID-19 pandemic because they help meet the public's daily needs. The fear of being exposed to COVID-19 and taking care of oneself as a form of implementing health protocols makes OFDA one of the solutions to meeting the need for food, alongside throwing away food if it is deemed contaminated and forming a larger worry (48). Additional results show that the need for OFDAs influences how people use them in the short and long term. This study shows that behavioral intention to use does not mediate food delivery hygiene or perception of food safety on continued behavior. This supports the findings of the direct effect in this study, indicating that food delivery hygiene does not affect behavioral intention or behavior persistence. Although Al Amin et al (16) and Tran (5) found that in the context of intention to use, hygiene behavior in terms of food delivery is important, OFDAs provide a necessary service for the public during the present pandemic, thereby ensuring their continued use.

Based on the discussion of the above-mentioned research findings, there are several implementations of food safety and food hygiene procedures that are still useful for the food service industry using OFDAs in Greater Jakarta. First, along with policy changes and reductions in the number of COVID-19 cases in this region, vaccines

and boosters are the most important requirements that OFDA service providers must meet for customer safety. It is still necessary to inform customers through the online application that food delivery personnel have been vaccinated and have received a booster, as illustrated in Figure 5. Customers may feel more secure because of this. Furthermore, providing sanitizers is necessary for both food delivery workers and customers. The exchange of food can provide an opportunity for the SARS-CoV-2 virus to spread. Therefore, both customers and delivery workers should take care to reduce the spread of the virus. Third, customer-received food packaging should continue to be inspected, especially if there is a possibility of damage to the food packaging. Customers must continue to do this to reduce the possibility of SARS-Cov-2 adhering to food. Customers should not be embarrassed or afraid of not receiving food for inspecting their items, and they can file complaints directly with service providers. From a business standpoint, these factors can influence two types of usage behaviors including short-term and long-term OFDA user loyalty.

Conclusion

This study explains how the perception of food safety influences the use of OFDAs. In the short term, perceptions of food safety can influence decisions to use these applications. However, this does not change our intention to use these applications in the long term. Because there are indications that people are still

concerned about the spread of COVID-19 in Greater Jakarta, using OFDAs at this time, does not guarantee customer loyalty. Furthermore, this study shows that food delivery hygiene does not affect the use of OFDAs, both in terms of short-term and long-term use intentions. The intentional behavior of using OFDAs succeeded in mediating the perception of food safety on the continued use of OFDAs. Behavioral intention to use does not have a mediating effect on food delivery hygiene. This study focused on three main aspects based on the policy changes and the number of COVID-19 cases. The OFDA service provider ensures that food delivery workers have been vaccinated and have received a booster as required by government regulations. The provision of hand sanitizer is still considered necessary as a means of self-protection for both customers and food delivery personnel. Furthermore, both staff and customers must be aware of the importance of keeping food packaging clean and undamaged. Understanding health protocols benefits businesses not only in shaping the positive behavior of current users, but also in creating long-term user loyalty. This study has several limitations, including the short duration of the survey process, which results in a relatively small sample size. Although this survey period is dedicated to gathering public feedback at a time when COVID-19 cases are beginning to decline, future studies could be conducted with a more diverse or specific sample population. Because this study focused only on large cities with relatively high COVID-19 case reports compared to other regions, a comparison between big cities and other cities in more rural regions is a suggestion for future research. This is determined by several factors, including the virulence of a virus variant, vaccine availability, vaccination coverage in each area, and the COVID-19 status in each region. The public perceptions of food safety are dynamic in general, which means that if a new issue arises, the public perception of food safety will increase. Furthermore, the participants' health literacy was not specifically addressed in this study. However, the strength of this study is that it can provide new perspectives on food access and its impact on health.

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Authors' contribution

Conceptualization: Michael Christian.

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Formal analysis: Michael Christian, Suryo Wibowo.

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The authors declare that there is no conflict of interests.

Ethical issues

The authors confirm that all data acquired during the research are as stated in the manuscript, and no data from the study has been or will be published elsewhere.

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