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Determinants of customer loyalty to online food service delivery: evidence from Indonesia, Taiwan, and New Zealand

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ABSTRACT

This study is dedicated to m-commerce and examines the key factors determining loyalty to online food delivery (OFD) services in Indonesia, Taiwan, and New Zealand, as these countries have faced varying degrees of pandemic severity. The data analysis using Partial Least Square Structural Equation Modeling (PLS-SEM) shows that the quality of both food and e-service, satisfaction, perceived value, and trust are significant predictors of loyalty in all countries. Food quality drives consumer loyalty, contentment, and perceived value in Indonesia and Taiwan, but e-service quality is the main determinant in New Zealand. These differences can be attributed to the status quo of the OFD service market in the three countries pre-Covid, cultural factors, the pandemic severity, and consumer access to other distribution channels. Best practice recommendations for marketing managers associated with OFD are presented.

本研究致力于移动商务,并研究影响印度尼西亚、台湾和新西兰消费者对在线食品配送 (OFD) 服务忠诚度的关键因素,因为这些国家受到不同程度的大流行影响。研究使用偏最小二乘结构方程模型 (PLS-SEM) 的数据分析表明,食品和电子服务的质量、满意度、感知价值和信任度是所有国家忠诚度的重要预测指标。在印度尼西亚和台湾,食品质量推动了消费者的忠诚度、满意度和感知价值,但电子服务质量是新西兰的主要决定因素。这些差异可归因于疫情前三个国家的 OFD 服务市场的现状、文化因素、大流行的严重程度以及消费者对其他分销渠道的使用。研究针对 OFD 相关的营销经理提供了最佳实践建议。关键词:冠状病毒大流行;跨国比较;忠诚度、在线送餐;信任、满意、

KEYWORDS

Coronavirus pandemic;
cross-country comparison;
loyalty; online food delivery;
trust; satisfaction

Introduction

The rapid spread and associated fatality of the coronavirus pandemic in 2020 have brought significant challenges worldwide (Zanetta et al., 2021). Some governments were able to promptly impose health regulations and restrictions to lessen virus spread and associated mortality rates (Natarajan et al., 2022; Tully et al., 2021), but others were not, due to factors

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such as population size, public healthcare capacity, and financial limitations, resulting in high and low severity of COVID-19 infection across countries (Bonardi et al., 2020).

Public health restrictions immediately affected food-related businesses and consumption patterns, as dining in restaurants was restricted or forbidden (Byrd et al., 2021). Dining out quickly changed from enjoyable to unsafe activities (Aymerich-Franch & Ferrer, 2022; Cao & Song, 2022; Lee, 2020). Consequently, consumers shifted from restaurant dining or purchasing meals from food outlets to contactless food purchasing, facilitated by mobile apps (Chi et al., 2022). This shift provided growth opportunities but also increased competition for online food businesses (Chakraborty et al., 2022). In such a sensitive environment and growing market, developing customer loyalty is a clear path to success (Koay et al., 2022; Pee et al., 2018; Zhang et al., 2020).

The online food delivery (OFD) literature highlights that e-service quality, perceived value, food quality, and satisfaction are the main drivers of online loyalty (Saha & Mukherjee, 2022; Verma & Pant, 2021; Yeo et al., 2017). Before the COVID-19 outbreak, studies suggested that trust was a critical component, guiding customers in selecting offerings through mobile apps (Wu & Cheng, 2017), and influencing their future online loyalty behavior (Nisar & Prabhakar, 2017; Ventre & Kolbe, 2020). Customer trust is more critical during the pandemic (Asti et al., 2021) because customers need to believe that OFDs can deliver high-quality food safely (Suhartanto et al., 2021). Since trust plays a crucial role in influencing customer food shopping behavior during a pandemic, it is surprising that so few studies have included customer trust in their predictions of customers' future purchasing behavior (Suhartanto et al., 2022).

Numerous studies examining loyalty models of online food purchasing suggest that loyalty formation is complex and not fully understood (J. Wang et al., 2021). Further, variations found across results from different countries, regions, and environments (Chang et al., 2014; Suhartanto et al., 2019; Yeo et al., 2017) suggest that some models of online food loyalty from past studies may not apply to a pandemic environment. More recent studies dedicated to consumer behavior and online food shopping during a pandemic support this notion, as these studies report that country factors like pandemic severity and consumer factors like perceived impact may account for model variations and thus deserve academic attention (Hong et al., 2021; Leung & Cai, 2021). (Cai & Leung, 2020) assessed pandemic severity by counting the number of cases and deaths per capita and the severity and frequency of lockdowns. In the OFD context, studies report a switch from physical to online purchases due to the pandemic's severity.

However, the influence of pandemic severity on OFD loyalty models has not been thoroughly investigated. While most OFD studies acknowledge the impact of pandemic severity and describe measures taken to keep customers and OFD employees safe (Leung & Cai, 2021), investigated online food ordering and pandemic severity in a risk perception context; they found pandemic severity and perceived risk affect the use of OFD. In addition (Sharma et al., 2021), found price and trust as significant predictors of OFD app use in a pandemic severity context. Another study that explored key drivers to OFD loyalty in a pre-Covid and COVID-19 scenario found that vulnerability and pandemic severity did not affect customers' loyalty to OFD (Hong et al., 2021). Given that there is no consensus in the extant literature on whether or not pandemic severity influences consumers' OFD loyalty (Prasetyo et al., 2021) and studies on cross-country comparison and pandemic

severity are scant, the present research investigates the drivers and barriers to OFD loyalty. These include food and e-service quality, perceived value, satisfaction, and trust. The study focuses on Indonesia, Taiwan, and New Zealand as the countries have experienced different levels of pandemic severity in terms of waves and impacts of Covid-19, resulting in variations in the role and positioning of OFD across these countries. Understanding the influence of pandemic severity on loyalty toward OFD is crucial for marketing executives in food businesses, as future virus variants will not strike with the same level of severity. Managers' ability to respond to those conditions and to changing consumers' wants and needs will undoubtedly inform decision-making.

Online food purchasing and the effects of Covid-19 in three countries

Indonesia, Taiwan, and New Zealand represent various impacts and responses to coronavirus and the positioning of OFD. Indonesia has a large and relatively young population with a large appetite for OFD, which is a regular substitute for making meals at home for many millennials. It is reported that the market value of the Indonesian online food market is US\$ 1,951 million and is increasing by 11.5% per year (Statista, 2020).

The OFD market is home to a variety of enterprises, including international fast-food franchises, local food kiosks, and eateries in partnership with delivery services such as GoFood and GrabFood (Benhardy & Ronadi, 2020; Suhartanto et al., 2019). These services are accessible via apps that are easy to use and provide access to diverse options. The apps attract Indonesian customers' attention and increase brand awareness (Prasetyo et al., 2021). During the coronavirus pandemic, demand for OFD doubled, causing intense competition (Hidayat, 2020). Also, Indonesia had steadily increasing numbers of active COVID-19 cases with four peaks, occurring in July 2020 (0.01% of the population), Oct 2021 (0.02%), Feb 2021 (0.06%), and with the Delta variant in July 2021 (0.21%) (Worldometersinfo, 2021). According to (Prasetyo et al., 2021) these peaks were periods when consumers heavily relied on non-cash transactions and OFD and avoided physical shopping because of the high infection risk.

In Taiwan, the pandemic has changed the way of life, creating new business opportunities (Chuah et al., 2022). Although restaurants remained open, the number of food delivery orders more than tripled compared to the same period in 2020. The Market Intelligence & Consulting Institute surveyed Taiwanese netizens who have used OFD services since the pandemic's beginning (Li et al., 2021). Reportedly, 53.3% of netizens had already used OFD services multiple times, and 10.9% were first-time OFD users. In addition, those who had already used OFD and increased their frequency during the pandemic accounted for 22.1%. The motivation for those who use food delivery services was mainly to "save time going out and queuing" (50.4%) and "reduce the chance of contacting people when going out" (39.4%) (Li et al., 2021). Following (Cheng et al., 2021) approximately 26% of the Taiwanese population uses OFD, with service providers such as Uber Eats and Foodpanda enjoying popularity. Taiwan has kept the virus well under control, with active COVID-19 cases peaking twice in July 2020 (0.001% of the population) and with the Delta variant in June 2021 (0.032%) (Worldometersinfo, 2021).

After a peak of active COVID-19 cases in April 2020 (0.02% of the population) and a severe lockdown (only supermarkets open for food purchases), New Zealand kept the virus under control, with three more peaks occurring in August 2020 (0.002%) and

October 2020 (0.002%) and a lockdown with the Delta variant in September 2021 (0.015%) (Worldometersinfo, 2021). After the severe lockdowns in April 2020 and September 2021, restrictions were relaxed to allow meal delivery and contactless pickup for eateries with such capabilities, but dining in restaurants remained restricted (Roy et al., 2021). Research conducted at the beginning of the coronavirus pandemic was dedicated to the usage of OFD in Auckland, New Zealand (Partridge et al., 2020). It found that Auckland consumers prefer OFD outlets near their homes (between 1.5 km and 3 km), and the most popular outlets were fast food franchises such as Subway, McDonald’s, Burger King, and Hell Pizza, delivered through Uber Eats (Partridge et al., 2020). The pandemic severity effect on OFD was not examined, but (Partridge et al., 2020) emphasize that due to the coronavirus pandemic in New Zealand, restaurants and fast-food chains involved in OFD had increased their geographical delivery distance to reach a wider audience.

In addition to OFD-specific issues, global pandemic data supports differences in pandemic severity across the three countries. Table 1 shows that in September 2020, Indonesia experienced more cases and deaths per million population from the pandemic, and Taiwan’s quick response yielded the lowest number of cases and deaths per million. New Zealand’s very restrictive lockdown seemed to reverse the order by September 2021, when it replaced Taiwan with the lowest number of deaths per million. By September 2022, any advantageous cases or deaths per million experienced by New Zealand or Taiwan seemed to be lost, with Indonesia having the lowest number of cases per million, and all the countries had similar numbers of total deaths per million.

In summary, during 2020 and 2021 Indonesia experienced rapidly growing numbers of COVID-19 cases and deaths, which could be interpreted as a high level of pandemics severity. In such a situation, an OFD market is a necessity for most consumers, with a wide variety of providers and food assortments while battling Covid-19. Taiwan had a rapid response to Covid-19, with the best global statistics in 2020 but lost ground in 2021. Perhaps this presents a well-prepared early response balance of necessity and convenience in the OFD market with dining available. Finally, New Zealand was unprepared in early 2020 and it took severe lockdowns and border closing to get COVID-19 largely under control. This continued into 2021 when New Zealand’s OFD was largely the domain of fast-food chains and dining was still restricted.

Table 1. Pandemic total cases and total deaths 2020–2022.

	Population	September 2020		September 2021		September 2022	
		Total to Date	Total to Date/ million	Total to Date	Total to Date/ million	Total to Date	Total to Date/ million
Indonesia	279,132,505						
Cases		287,008	1,028	4,213,414	15,095	6,429,767	23,035
Deaths		10,601	38	141,826	508	158,112	566
Taiwan	23,888,595						
Cases		514	22	16,216	679	6,461,337	270,478
Deaths		7	0.3	842	35	11,053	463
New Zealand	4,898,203						
Cases		1,835	375	4,248	867	1,783,739	364,162
Deaths		30	6	32	7	2,979	608

Conceptual framework

Given the focus of the present study, it is necessary to revisit equity theory, as the foundation for satisfaction and ultimately loyalty. Equity theory is concerned with consumer value perception and satisfaction with a product or service. It postulates that when consumers believe that the value of a product or service purchase outweighs the time and money invested in the product or service, they will be satisfied. The extant literature emphasizes that food and service quality are key drivers of satisfaction, trust, and behaviors such as loyalty. The predictors of OFD loyalty in a pandemic context are discussed in greater detail in the following sections.

OFD loyalty

As the OFD business is competitive, having satisfied and loyal customers are critical to business success (J. Ha & Jang, 2010). Following (Oliver, 1999) loyalty refers to the consumer commitment to repurchase desired products and services, despite situational circumstances and marketing efforts. Loyalty toward a product or service is based on vendor, service, and retailer attributes. Scholars believe that e-loyalty expands these forms of loyalty by combining online technology that links clients and the company (Kim et al., 2009; Pee et al., 2018). They define e-loyalty as a customer's loyalty to an online firm, specifying their intention to return, complete a purchase, and recommend the website to others (Al Amin et al., 2023; Saha & Mukherjee, 2022). Because OFD is the focus of this investigation, e-loyalty is defined as customers' commitment to using OFD services, resulting in repurchases and favorable actions toward the service provider.

Product loyalty is often measured as a set of behaviors, a set of attitudes, or a combination of both (Prasetyo et al., 2021). A behaviorally loyal customer will purchase the same product or services from the same company over a certain period (Saha & Mukherjee, 2022). A person who expresses their intention to recommend and repurchase would be considered attitudinally loyal (Gursoy et al., 2014). However, because both the intent and behavior of customers are important, scholars (Gursoy et al., 2014; Pal et al., 2022; Saha & Mukherjee, 2022) have created a composite loyalty, integrating behavioral and attitudinal components. According to this third approach, loyalty to OFD is assessed by a customer's willingness to purchase, repurchase and recommend the OFD provider to others. Using this method, researchers can assess current and future customer loyalty. Customer loyalty to OFD services in this research is composite loyalty.

Recent advances in the Quality-Loyalty Model have had success explaining customer loyalty (Chandra et al., 2019; Suhartanto et al., 2018). Constructed using the cognitive-rational behavioral method (Cronin et al., 2000), suggest that quality, perceived value, and customer satisfaction are the primary loyalty drivers. The logic is that if a customer appraises a product based on quality, and assesses it based on perceived value, then the result will be satisfaction for a product that delivers both. The American Customer Satisfaction Index model, which claims that quality has a favorable influence on satisfaction and future behavioral intentions, is used to support this claim (Fornell et al., 1996). Previous studies, which include purchasing online food (Suhartanto et al., 2019; Zhang et al., 2020), confirm that essential determinants of loyalty are product quality, service quality, perceived value, and satisfaction. The model is also supported because it provides valuable recommendations for marketers and managers (Chandra et al., 2019; Suhartanto et al., 2018). Thus, the Quality-Loyalty model has been adopted in this study to explain customer loyalty toward OFD services.

Satisfaction with OFD

Customer satisfaction is crucial because it affects future customer purchasing behavior, shareholder value, and business profitability (Koay et al., 2022; Nisar & Prabhakar, 2017). The most frequently referenced satisfaction definition is a sense of fulfillment that occurs when a result meets or exceeds some adopted standard (Oliver, 1999). Following this description, a customer is satisfied when their expectations are met or surpassed by the performance of an offering (Han et al., 2022; Zvarikova et al., 2022). (Prasetyo et al., 2021) found that price, information quality, and advertisements were significant predictors of satisfaction with OFD during the coronavirus pandemic. Surprisingly, e-satisfaction was not a strong predictor of satisfaction and loyalty. Online or e-satisfaction extends the concept of traditional satisfaction by incorporating the performance of online technologies that connect the customer to the company (Teeban Raj et al., 2021).

The investigation of customer satisfaction drivers in e-commerce is expanding (Annaraud & Berezina, 2020; Pham & Ahammad, 2017) and research has found that specific features of the online interface can affect customer experience and satisfaction in online shopping (Pee et al., 2018; Yeo et al., 2017) and benefit online enterprises (Jeon & Jeong, 2017). These features include security, brand desirability, content quality, download speed, and approval by influencers (Anbumathi et al., 2023; Blake et al., 2005; X. Chen & Lee, 2022). However, precisely how these characteristics influence satisfaction is still debated (Nisar & Prabhakar, 2017). Past research has examined satisfaction with the online shopping experience and e-service quality, post-purchase behavior, and consumer buying (individual or group) in various businesses, including food providers (Suhartanto et al., 2019). Moreover, previous research has appraised customer satisfaction with their online purchasing experience based on the quality of e-service (Chang et al., 2014; Jeon & Jeong, 2017) across various industries, including OFD (Suhartanto et al., 2019). These studies, however, have paid little attention to post-consumption, concentrating instead on online satisfaction pre- and post-purchase (Pham & Ahammad, 2017). Therefore, the subsequent hypothesis is formulated:

H₁: Satisfaction with OFD positively affects customer loyalty

E-service quality

(Zeithaml et al., 2002) define e-service quality as the quality of an online platform to enable users to review, purchase, and receive products and services delivered efficiently and effectively. This description emphasizes how customers judge the platform's performance when conducting transactions (Caruana & Ewing, 2010). These factors are critical for e-commerce, such as OFD, where engagement between provider and customer happens virtually. It is, therefore, critical to keeping the platform quality high to ensure client loyalty (Jeon & Jeong, 2017) and business success (Parasuraman et al., 2005; Pee et al., 2018).

Dimensionality, antecedents, and effects of e-service quality have been the focus of many past studies. (Parasuraman et al., 2005) pioneered the dimensionality of e-services by employing the ES-QUAL approach, assessing the quality of e-service across four aspects:

system accessibility, confidentiality, efficiency, and satisfaction. Past studies indicate that e-service quality influences e-loyalty (Chang et al., 2014; Jeon & Jeong, 2017; Mihajlović, 2017; Pee et al., 2018). Since the pandemic started, the relevance of e-service quality has strengthened with the increased use of OFD apps and e-service features that limit the risk of infection and increase consumer capability to track their orders (Koay et al., 2022; Su et al., 2022). (Hong et al., 2021) outline that perceived usefulness, perceived ease of use, price-saving benefit, time-saving benefit, and risk perception were important aspects of e-service quality during times of pandemic severity. Similarly (C. Wang et al., 2021), emphasize OFD workers, platform quality, and content consistency affect the satisfaction and trust of OFD consumers. Both satisfaction and trust have an impact on a consumer's usage intentions and loyalty. In light of this, the following hypothesis in OFD is proposed.

H₂: The quality of e-service has a direct and positive impact on satisfaction

Food quality

The overall food performance indicator is food quality is considered a crucial part of the patron experience with food service providers (Annaraud & Berezina, 2020; Dsouza & Sharma, 2021; J. Ha & Jang, 2010). While past studies have emphasized the importance of the quality of food, its fundamental features vary greatly (J. Ha & Jang, 2010). use flavor, nutritional value, and diversity to gauge the effect of diners' food experiences on their enjoyment and intent to revisit the restaurant. (Sulek & Hensley, 2004) state customers commonly use safety, appeal, and dietary criteria to judge food quality. (Namkung & Jang, 2007) have adopted quality indicators such as menu diversity, meal presentation, dietary value, flavor, freshness, and food temperature. Overall, food quality is considered a critical element influencing the dining out experience (Dsouza & Sharma, 2021; He et al., 2019; Suhartanto et al., 2019).

The importance of food quality in restaurants has been extensively researched. (Liu et al., 2017) claim that food quality is a primary motivator when choosing a restaurant. (Mattila, 2001) emphasizes that for casual dining, food quality is the strongest driver of a patron's restaurant loyalty. (Sulek & Hensley, 2004) argue that meal quality influences satisfaction the most; they underline the importance of food quality and its link to customer loyalty because it influences satisfaction, purchase intent, and recommendation (Namkung & Jang, 2007). Despite being a critical component for restaurants, only a few studies in the OFD context have looked at food quality to predict future purchase behavior (Dsouza & Sharma, 2021; He et al., 2019; Sharma et al., 2021). (Sharma et al., 2021) discovered that the web interface and food quality positively influence consumer attitudes and shopping routines in this context. Based on the previous findings, it is reasonable to expect that meal quality will influence favorably loyalty toward OFD.

H₃: Food quality has a direct and positive impact on satisfaction

Perceived value

Before making a purchasing decision, shoppers compare the advantages and disadvantages of offerings using available information and reviews (Huifeng & Ha, 2021; Salehi-Esfahani et al., 2023). and Bilgihan et al. (2018) emphasize the reviews as important sources that guide the decision-making processes of consumers. Consequently, being perceived as offering good benefits for the cost is crucial for any business, including e-businesses (Pham & Ahammad, 2017; Tavitiyaman et al., 2022). Previous empirical investigations have discovered a positive link between e-service, quality, and perceived value (Caruana & Ewing, 2010; Jeon & Jeong, 2017; Zhong & Moon, 2020). Since the occurrence of Covid-19, other factors such as contactless payment and convenience have been emphasized in OFD studies, and consumers place extra value on businesses that are not associated with infection or threaten their health (Pal et al., 2022; Suhartanto et al., 2021; Zhao & Bacao, 2020). (Huang, 2023) indicates that consumer attitudes toward OFD services are positively associated with their intention to use and remain loyal to these services. Because the literature implies that satisfaction is directly influenced by perceived value (Caruana & Ewing, 2010), subsequent hypotheses are developed.

H₄: The quality of e-service has a direct and positive impact on perceived value

H₅: The quality of food has a direct and positive effect on perceived value

Previous research into the link between perceived value, customer satisfaction, and customer loyalty has been extensively addressed in several contexts, including restaurants (Ali et al., 2019; Suhartanto et al., 2018). Most of these studies show that perceived value favorably affects both satisfaction and loyalty.

H₆: Perceived value has a positive and direct effect on satisfaction

H₇: Perceived value has a positive and direct effect on loyalty

Trust

The expectation of one party that the other will not engage in opportunistic behavior is referred to as trust (Park et al., 2019). In the context of e-commerce, trust reflects a customer's belief that online service vendors will fulfill their business commitments (Jun et al., 2022; Troise et al., 2021; Ventre & Kolbe, 2020). Company commitment, competence, honesty, dedication, and care toward customers have been considered significant components of trust in e-commerce contexts (Elbeltagi & Agag, 2016; Punyatoya, 2019). Gaining client trust is crucial, especially for OFD retailers (De Cicco et al., 2021; Hong et al., 2021; Ventre & Kolbe, 2020), since a lack of trust is the leading reason why consumers discontinue purchasing a product (Park et al., 2019). Another important aspect

of trust is the ability to easily search for and obtain product information, reducing uncertainty when making online purchases (Hsiao & Chen, 2022; Su et al., 2022). During the pandemic, trust in OFD providers has strengthened, as buyers expect the product to meet their demands while also being virus-free (Suhartanto et al., 2021).

Drivers of e-commerce trust have been identified (Punyatoya, 2019; Sarkar et al., 2020) and categorized into (1) features of e-service, (2) previous consumer engagement, and (3) consumer confidence in both the provider and the product. (De Cicco et al., 2021) indicate the importance of interactivity, enjoyment, and trust in an e-service context, particularly when consumers are interacting with the OFD service provider via chatbots. Thus, the key drivers of trust in OFD center on a customer’s positive experience with e-service and food quality. According to past research, customer trust boosts their satisfaction levels and increases their desire to both purchase the product again and recommend the provider to others (Gao & Waechter, 2017; Talwar et al., 2020). Thus, the following hypotheses are developed.

H₈: The quality of e-service has a direct and positive impact on trust

H₉: The quality of food has a direct and positive impact on trust

H₁₀: Trust has a positive and direct effect on satisfaction

H₁₁: Trust has a positive and direct effect on loyalty

Figure 1 depicts the proposed conceptual model, which is based on the recent body of literature. The conceptual model shows the relationship between food quality and e-service in determining customer perceived value, trust, and satisfaction, which leads to OFD loyalty.

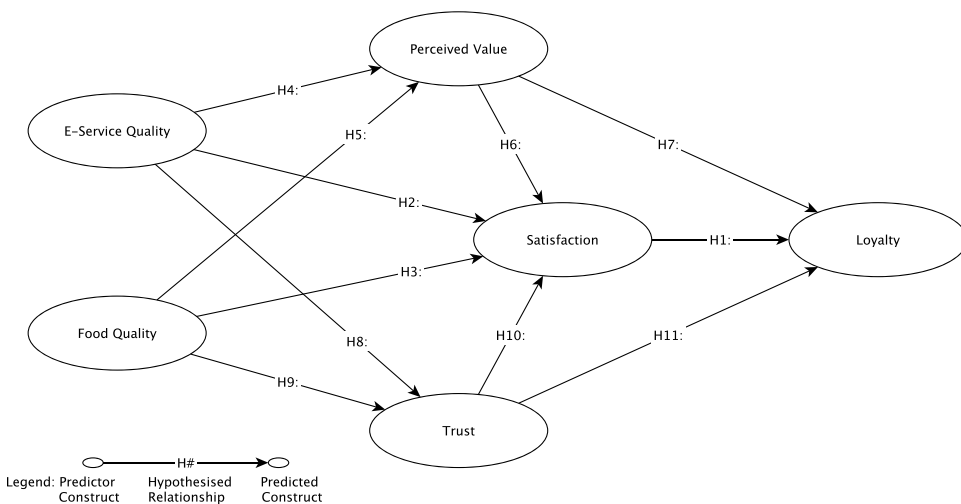


Figure 1. Conceptual model of customer loyalty.

Materials and methods

Data was obtained from Indonesian, Taiwanese, and New Zealand OFD consumers. A questionnaire was developed, and the survey was managed by Qualtrics from July to October 2020. The survey was developed in English and then converted into two other languages. Three language experts with proficiency in their respective languages translated the questionnaires to assure translation accuracy and that content was culturally appropriate and correctly conveyed. The survey questions were then pre-tested with 20 customers with experience in OFD to ascertain the clarity of questions, scales, and instructions. Minor changes to the questionnaire wording were made as a result of the pretest.

The constructs employed in this research stem from the recent literature, allowing the adaption and adjustment of items and scales. Five items dedicated to trust were adapted from (Jang et al., 2020; T. M. Ha et al., 2020) and (Ventre & Kolbe, 2020) and five items about food quality were adapted from (Lu et al., 2020) and (Suhartanto et al., 2019). Following (Suhartanto et al., 2019) and (Yeo et al., 2017) ten e-service quality items were developed. Lastly, three indicators each for loyalty and satisfaction were modified from (Y. S. Chen & Chang, 2013) and (T. M. Ha et al., 2020). All indicators are displayed in Table 3 and measured on a five-point Likert scale from “1: strongly disagree to 5: strongly agree.”

Because this study on OFD loyalty was conducted soon after the onset of the pandemic, a sampling frame of OFD consumers was unavailable. Therefore, a convenience sample was deemed appropriate as a solution, despite being a non-probabilistic sampling method. The online data collection resulted in an overall sample of 935 responses suitable for analysis. SPSS was used to generate the descriptive statistics and characterize the samples from Indonesia, Taiwan, and New Zealand. SmartPLS facilitated the partial least square structural equation modeling (PLS-SEM), which was employed to investigate the conceptual model and test the hypotheses.

PLS-SEM is a variance-based structural equation modeling approach following a twofold process. Following (Hair et al., 2022) the model constructs were tested for both validity and reliability, then the model's structure was assessed and the proposed hypotheses were tested. (Hair et al., 2022) claim that using PLS-SEM to evaluate the proposed models is appropriate if the study is intended for theory validation. This research aims to test relationships between model constructs and assess the predictive ability of exogenous variables on endogenous variables, so PLS-SEM usage is suitable. PLS multigroup tests were used to assess significant differences between the three countries under investigation. The first step in the multigroup analysis was to identify model invariance, namely, whether the hypotheses were supported across all three countries. Next, the relationships were examined for differences in the strength of the proposed relationships. Then, one-way ANOVAs were run on the sample mean responses, and the Games-Howell method was used to determine if there were any significant differences between the three countries' mean responses.

To determine whether the data were suitable for analysis, variance inflation factor (VIF) values were measured to identify the presence of multicollinearity. The largest VIF value was 4.058, suggesting that common method variance is not problematic.

Results and discussion

Useful data were collected from a total of 935 participants: Indonesia (440), Taiwan (275), and New Zealand (220). The demographics of the respondent profile are depicted in [Table 2](#). Cross-tabulations and column proportion z-tests were performed to determine if there were any significant demographic differences across the countries. The only significant difference was the proportion of 18 to 25-year-old respondents across all three countries.

Measurement model test

Factor loadings, Composite Reliability (CR), Cronbach Alpha (CRA), and Average Variance Extracted (AVE) – gauge the reliability and validity of the constructs. [Tables 2a, 2b, and 2c](#) indicate that the factor loadings of all indicators are more than 0.6, except for the item “Secure payment transactions” for the Indonesian and New Zealand sub-samples. Therefore, in subsequent analyses, the “Secure payment transactions” was excluded. The thresholds for CRA and CR (>0.7) and AVE (>0.5) were satisfied, meeting the requirement of validity and reliability (Hair et al., 2022). [Table 4](#) shows that the Heterotrait-Monotrait checks were below the threshold (<0.9), indicating acceptable discriminant validity (Henseler et al., 2015).

Structural model

This research used 5000 samples in the bootstrapping procedure, as (Hair et al., 2022) recommend. The goodness of fit indices for Taiwan, Indonesia, and New Zealand, were 0.498, 0.491, and 0.389, respectively, indicating that the model matches the study’s goal. Furthermore, the normal fit indices (0.775, 0.791, and 0.730) and the standardized root mean square residuals (0.073, 0.066, and 0.073) for Taiwan, Indonesia, and New Zealand, demonstrate that the model is adequately well-fitting. Moreover, the R^2 values for Taiwan, Indonesia, and New Zealand are 0.579, 0.540, and 0.527, suggesting that all the determinant variables explain 58%, 54%, and 52.7% loyalty. Finally, the result of Q^2 indicates that all values of the constructs are positive, suggesting that the predictive relevance is acceptable (Chin et al., 2008). The main model fit conditions are generally met, although the normal fit indices were lower than the recommended level of 0.8. [Figure 2](#) and [Table 5](#) shows the outcomes of assessing the hypothesized links among variables.

The t-values in [Table 5](#) show that e-service quality has no considerable effect on customer satisfaction for the Indonesian sample, but it is significant ($p < 0.01$) for Taiwan ($\beta = 0.213$) and New Zealand ($\beta = 0.163$) samples. Thus, hypothesis H2 is supported only for Taiwan and New Zealand samples. These results confirm recent studies that emphasize the value of high-quality e-service during the pandemic. It appears that the OFD markets in Indonesia and Taiwan are more sophisticated than in New Zealand, offering a wider range of products and providers through first-party (website and via application of specific restaurants) and

Table 2. Respondent demographic profile.

Description	Indonesia		Taiwan		New Zealand	
	Frequency	%	Frequency	%	Frequency	%
Gender						
Male	159 _{a,b}	36	89 _a	32	95 _b	45
Female	281 _{a,b}	64	186 _a	68	125 _b	55
Age						
18–25	170 _a	38	236 _b	60	27 _c	12
26–35	144 _a	33	89 _a	32	94 _b	43
36–45	86 _a	20	8 _b	3	77 _a	35
>45	40 _a	9	13 _b	5	22 _a	10
Highest education						
< High School	27 _a	6	5 _b	2	3 _b	1
High School	189 _a	43	26 _b	9	66 _a	30
Diploma	145 _a	33	234 _b	85	96 _a	44
Graduate/Post	79 _a	18	10 _b	4	55 _a	25
Occupation						
Entrepreneur	27 _a	6	13 _a	5	15 _b	8
Employee	189 _a	43	75 _b	27	69 _b	31
Student	145 _a	33	162 _b	59	113 _b	51
Others	79 _a	18	25 _b	9	23 _a	10
Average purchase						
<2/month	315 _a	72	145 _b	53	143 _a	65
3–5/month	88 _a	20	116 _b	42	54 _a	25
>5/month	37 _a	8	14 _b	5	23 _a	10

Note: Each subscript letter denotes a Country category whose column proportions do not differ significantly from each other at the .05 level.

third-party delivery apps (Cheng et al., 2021; Prasetyo et al., 2021). By contrast, not many options were available to New Zealand consumers at the beginning of the pandemic (Ma et al., 2022; Roy et al., 2021). Specifically, only supermarkets and greengrocers were allowed to sell food to the public during the strictest lockdowns (Gerritsen, Egli, et al., 2021; Hall et al., 2021; Roy et al., 2021). In addition, even pre-Covid, OFD options in Taiwan and Indonesia were likely more widely available. Many food producers and restaurants in New Zealand started implementing these options or strengthening their contactless online delivery efforts during the pandemic’s later stages (Gerritsen, Egli, et al., 2021).

Food quality’s impact on satisfaction (H3) is significant for Taiwan ($\beta = 0.301, p < 0.01$) and New Zealand ($\beta = 0.298, p < 0.01$) samples but not for the Indonesian sample, suggesting that support for H2 is limited to Taiwan and New Zealand. Not surprisingly, the coefficient was significantly lower for the Indonesian sample. Given the absence of a consensus on a clearly defined understanding of food quality in an OFD context, interpreting these results is not straightforward. Many early and recent studies outline that important food attributes encompass intrinsic aspects or those inherent to food items and closely associated with the sensory experience and commercial elements, such as the menu, presentation, size, and variety that specifically emphasize these intrinsic attributes (Liu et al., 2017; Sulek & Hensley, 2004). (Eu & Sameeha, 2021) found that mood and sensory attraction factors, including taste, appearance, and “feeling good” effects, were among the top three factors for Asian consumers when choosing OFD apps. In contrast (Partridge et al., 2020), emphasize that New Zealand consumers use OFD mainly for ordering fast food products from chains offering a standardized assortment of products. In New Zealand’s case, convenience factors are likely to be of higher priority.



Table 3. Scale/Item reliability and validity analysis.

Construct/Item	Indonesia				Taiwan				New Zealand			
	Load	CRA	CR	AVE	Load	CRA	CR	AVE	Load	CRA	CR	AVE
E-Service Quality (mean: 3.975; sd.: 0.631)		0.900	0.917	0.551		0.925	0.937	0.623		0.908	0.922	0.569
- Easy to use	0.714				0.770				0.718			
- Attractive interface	0.729				0.749				0.682			
- Running well (no error)	0.747				0.771				0.721			
- Easy to find the suitable foods	0.685				0.772				0.816			
- Informative	0.765				0.758				0.740			
- Transactions can be done quickly	0.797				0.820				0.753			
- An immediate food delivery	0.771				0.810				0.770			
- Food delivery is as promised	0.741				0.841				0.778			
- Keeping consumer personal data secure	0.724				0.811				0.801			
- Secure payment transactions	0.411				0.758				0.458			
Food quality (mean: 3.790; sd.: 0.607)		0.822	0.874	0.582		0.849	0.890	0.619		0.825	0.874	0.581
- The food looks appetizing	0.765				0.755				0.753			
- Various food choices	0.717				0.752				0.766			
- The food suits my taste	0.794				0.801				0.790			
- The food is nutritious	0.724				0.808				0.686			
- The food is fresh	0.810				0.815				0.811			
Trust (mean: 3.791; sd.: 0.598)		0.878	0.907	0.661		0.861	0.900	0.643		0.853	0.892	0.623
- I trust that the merchant is trustworthy	0.844				0.809				0.748			
- I trust the app is reliable	0.822				0.761				0.832			
- I trust my personal data is safe	0.725				0.801				0.780			
- I trust the food is good food	0.854				0.805				0.802			
- I trust that the food is hygienically processed	0.813				0.833				0.782			
Satisfaction (mean: 3.817; sd.: 0.647)		0.792	0.876	0.702		0.851	0.909	0.770		0.812	0.883	0.715
- I got what I wanted	0.837				0.880				0.838			
- It exceeded my expectation	0.817				0.866				0.799			
- Overall, I was satisfied	0.859				0.886				0.898			
Loyalty (mean: 3.773; sd.: 0.668)		0.805	0.864	0.615		0.833	0.879	0.648		0.827	0.876	0.639
- Intend to re-purchase	0.830				0.856				0.812			
- Intend to recommend	0.825				0.865				0.870			
- Willing to give a positive review	0.780				0.855				0.773			
- Intend to re-purchase even if the price increases	0.693				0.617				0.738			
Perceived value (mean: 3.776; sd.: 0.641)		0.776	0.854	0.596		0.787	0.849	0.584		0.789	0.857	0.600
- Reasonable food price	0.695				0.680				0.740			
- Easy in getting food	0.768				0.786				0.831			
- Efficient in obtaining food	0.839				0.803				0.795			
- Easier in choosing foods	0.778				0.783				0.727			

Note: Load: item/scale factor loading, CRA: Cronbach's Alpha, CR: Composite Reliability, AVE: Average Variance Extracted.

Table 4. Heterotrait-monotrait ratio (Indonesia, Taiwan, New Zealand).

Construct	Loyalty	Satisfaction	E-Service Quality	Food Quality	Perceived Value
Satisfaction	0.874 _{IN} 0.814 _{TW} 0.836 _{NZ}				
E-service quality	0.713 _{IN} 0.717 _{TW} 0.687 _{NZ}	0.768 _{IN} 0.714 _{TW} 0.738 _{NZ}			
Food quality	0.619 _{IN} 0.718 _{TW} 0.663 _{NZ}	0.763 _{IN} 0.816 _{TW} 0.856 _{NZ}	0.817 _{IN} 0.790 _{TW} 0.794 _{NZ}		
Perceived value	0.791 _{IN} 0.791 _{TW} 0.739 _{NZ}	0.892 _{IN} 0.741 _{TW} 0.859 _{NZ}	0.770 _{IN} 0.598 _{TW} 0.670 _{NZ}	0.762 _{IN} 0.726 _{TW} 0.723 _{NZ}	
Trust	0.727 _{IN} 0.752 _{TW} 0.747 _{NZ}	0.838 _{IN} 0.707 _{TW} 0.813 _{NZ}	0.766 _{IN} 0.640 _{TW} 0.747 _{NZ}	0.855 _{IN} 0.798 _{TW} 0.810 _{NZ}	0.759 _{IN} 0.676 _{TW} 0.798 _{NZ}

Note: Indonesia/Taiwan/New Zealand.

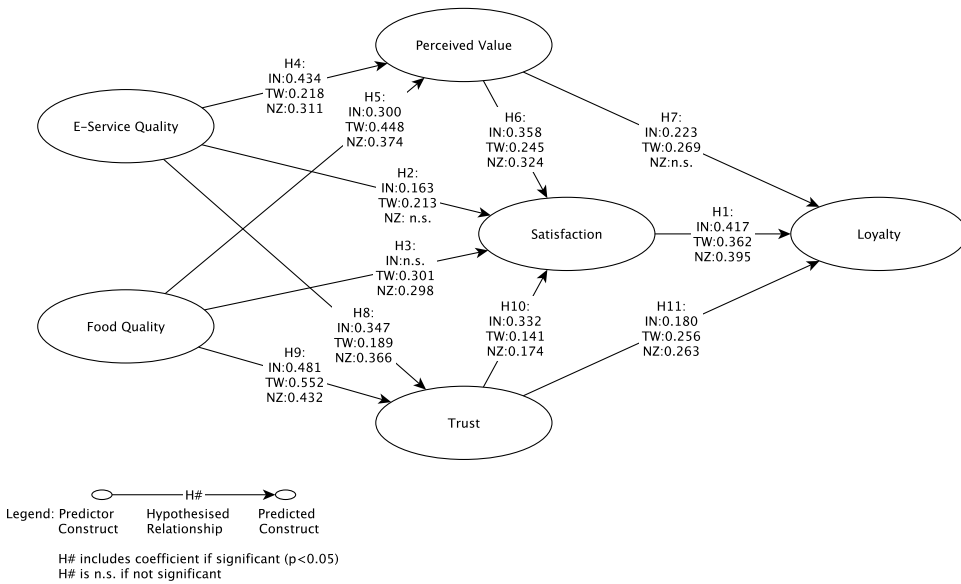


Figure 2. Customer loyalty results

Table 5. Hypothesis testing results and multi-group path coefficient comparisons.

Hypothesised Paths	Indonesia		Taiwan		New Zealand	
	β	t-value	β	t-value	β	t-value
H1: Satisfaction → Loyalty	0.417	6.911**	0.362	6.191**	0.395	5.181**
H2: E-Service quality → Satisfaction	0.163	2.802**	0.213	2.809**	0.133	1.838
H3: Food quality → Satisfaction	0.042 _{NZ,TW}	0.768	0.301 _{IN}	3.692**	0.298 _{IN}	4.176**
H4: E-Service quality → Perceived value	0.434 _{TW}	8.627**	0.218 _{IN}	2.404*	0.311	3.460**
H5: Food quality → Perceived value	0.300	5.424**	0.448	5.059**	0.374	3.712**
H6: Perceived value → Satisfaction	0.358	6.798**	0.245	3.226**	0.324	4.234**
H7: Perceived value → Loyalty	0.223	4.244**	0.269	4.828**	0.154	1.294
H8: E-Service quality → Trust	0.347	6.533**	0.189	2.380*	0.366	4.684**
H9: Food quality → Trust	0.481	8.703**	0.552	7.925**	0.432	5.305**
H10: Trust → Satisfaction	0.332 _{TW}	5.987**	0.141 _{IN}	2.243*	0.174	2.299**
H11: Trust → Loyalty	0.180	3.013**	0.256	4.532**	0.263	2.850**

**significant at $p < 0.01$, *significant at $p < 0.05$.

NZ, TW, IN: Coefficient is significantly different from NZ, Taiwan, or Indonesia.

Hypotheses H4 and H5 address the e-service and food quality role in determining consumers' perceived value. Table 5 shows those effects are significant for all samples, which means Hypotheses H4 and H5 are fully supported, although the largest coefficient (Indonesia) was significantly larger than the lowest coefficient (Taiwan). These results support the OFD app usage and OFD loyalty literature in pre-Covidian and Covidian times (Eu & Sameeha, 2021; Miao et al., 2022; Suhartanto et al., 2019). (Suhartanto et al., 2019) underline the role of products and e-service qualities in driving satisfaction and OFD loyalty. When it comes to perceived value, consumers, irrespective of their country, need to make trade-offs between benefits and sacrifices associated with e-service and food quality. These trade-offs have changed in Covidian times, largely due to the increased availability of OFD services across all countries.

Similarly, the influence of perceived value on satisfaction (H6) is significant for all samples; thus, H6 is reinforced. Hypothesis H7 (the effect of perceived value on loyalty) was not found in the New Zealand sample but was significant in Taiwan ($\beta = 0.269, p < 0.01$) and Indonesia ($\beta = 0.223, p < 0.01$) samples. To determine satisfaction, consumers evaluate the perceived value of the food quality and e-service based on comparisons with their expectations. Consumers are satisfied when the products and services presented by OFD providers exceed their expectations (Liu et al., 2017; Suhartanto et al., 2018). In Covidian times, particularly in countries hit hard by the pandemic, it is likely that not all consumer expectations can be fulfilled, due to supply and delivery shocks resulting in stockouts or delays (Hall et al., 2021). Perhaps For Taiwan and Indonesia, where OFD offerings were not limited to fast food chains, perceived value played a larger part in customer loyalty, explaining the findings of hypothesis H7.

Further, Table 5 notes that hypotheses H8 to H11 are supported in all three samples although the sample with the strongest relationship between trust and satisfaction (Indonesia) was found to be significantly higher than the sample with the weakest relationship (Taiwan). The effects of e-service and food quality on trust, as well as trust's influence on satisfaction and loyalty, are positive and significant across Indonesia, Taiwan, and New Zealand samples. The findings on trust are consistent with previous research, confirming its importance during the pandemic. OFD service providers are considered trustworthy by increasingly health-conscious customers if they offer products and services that are not associated with negative aspects of the coronavirus (Jang et al., 2020; Suhartanto et al., 2022). Some researchers have distinguished first-party OFD providers, who interact directly with consumers, from third-party OFD services involving intermediaries (Tittle et al., 2020). Since many OFD third-party providers are branded online platforms (Cheng et al., 2021; Partridge et al., 2020; Prasetyo et al., 2021), high performance in terms of food quality and e-service is expected and allows consumers to build trust toward these OFD brands, hence explaining the significant results across all countries.

Finally, satisfaction's influence on loyalty is also significant across Indonesia ($\beta = 0.395, p < 0.01$), Taiwan ($\beta = 0.362, p < 0.01$), and New Zealand ($\beta = 0.417, p < 0.01$) samples, providing full support for Hypothesis H12. Following (Suhartanto et al., 2019) and (Eu & Sameeha, 2021) satisfaction influences loyalty toward OFD providers, as satisfied customers tend to recommend to others, write online endorsements, and commit to repeating purchases. In other words, OFD providers that meet consumer expectations have satisfied and loyal customers (Eu & Sameeha, 2021). This association between loyalty and satisfaction seems to transcend country and pandemic severity.

Table 6. Multi-group mean comparisons.

Total Effect	Indonesia		Taiwan		New Zealand	
	Mean	StDev	Mean	StDev	Mean	StDev
E-Service Quality	4.176 _{TW,NZ}	0.552	3.789 _{IN}	0.632	3.818 _{IN}	0.655
Food Quality	3.888 _{TW}	0.556	3.622 _{IN,NZ}	0.603	3.819 _{TW}	0.658
Loyalty	3.919 _{TW,NZ}	0.629	3.698 _{IN}	0.599	3.620 _{IN}	0.769
Perceived Value	3.948 _{TW,NZ}	0.586	3.558 _{IN,NZ}	0.579	3.716 _{IN,TW}	0.690
Satisfaction	3.885 _{TW}	0.608	3.732 _{IN}	0.642	3.783	0.706
Trust	3.836 _{TW}	0.596	3.621 _{IN,NZ}	0.562	3.914 _{TW}	0.600

NZ, TW, IN: Mean is significantly different from NZ, Taiwan, or Indonesia.

While variations in relationship significance have been discussed, a second multigroup analysis was conducted to determine whether sample means differed significantly between the three countries. The results of the one-way ANOVA with the Games-Howell method can be seen in Table 6. The only construct to be significantly different across all three samples was perceived value, which was highest in Indonesia and lowest in Taiwan. Indonesia had higher scores than the other two country samples for e-service quality and loyalty, and higher than Taiwan for satisfaction. Taiwan had lower scores than the other two country samples for food quality and trust.

When examining the means, Indonesia reported significantly higher levels than one or both other countries for all the predictor and predicted constructs. However, only e-service quality, loyalty, and perceived value were higher than those in both countries. As Indonesia experienced the highest pandemic severity, perhaps this tangentially supports the notion that pandemic severity affects OFD attitudes and behavioral intention. However, we cannot rule out the explanation that Indonesia simply has superior OFD offerings.

While the mean comparisons in Table 6 are not as refined as the multigroup analysis results in Table 5, the results show that Indonesia's means were mostly higher, Taiwan's were generally lower, and New Zealand's were in between. While this is roughly consistent with global pandemic statistics in 2021, it does not align with the relative development of the OFD markets within the three countries.

While the OFD services were well established in Taiwan and Indonesia pre-Covid-19, a large part of their development in New Zealand occurred in 2020 (Gerritsen, Sing, et al., 2021; Partridge et al., 2020). Indonesian and Taiwanese consumers may have already had higher food quality expectations, given the number and popularity of branded platforms tailoring to restaurants and fast-food chains (Cheng et al., 2021; Prasetyo et al., 2021). The differences between Indonesia and Taiwan may be socio-cultural or a result of trade-offs, the relative importance given to food quality and e-service, and ultimately satisfaction and trust. These factors are influenced by other customers, immediate social environment, and culture (Eu & Sameeha, 2021).

Conclusion

Discussion of theoretical contributions

Theoretically, this study contributes significantly to the loyalty model in the OFD context during a pandemic. While past studies have focussed on a specific region or country (Chang

et al., 2014; Suhartanto et al., 2021; Yeo et al., 2017), this study uses the pandemic severity as the basis of analysis across countries. The fitness of the proposed model and the cross-country comparison between OFD loyalty and pandemic severity fills a literature gap. To date, this combination has been examined only in individual country contexts, ignoring that the severity of the pandemic dictates different actions to fulfill consumer needs and wants and ultimately win their loyalty. Second, this study extends the Quality-Loyalty Model (Chandra et al., 2019; Lu et al., 2020; Suhartanto et al., 2018) by including trust as an essential component during the pandemic, linking product and system customer experiences with post-purchase attitudes and behaviors, measured by satisfaction and loyalty. Building on the work of (Lu et al., 2020) the combination of the quality-loyalty model, spillover theory, and trust as an important predictor, highlighted by the present study, may be delivering promising results for future investigations.

Suggestions for practitioners and managers

From a managerial perspective, the varying degree of pandemic severity is relevant for stakeholders in the online food industry, as new variants of the coronavirus will likely lead to countries facing the consequences of varying degrees of pandemic severity. The degree of pandemic severity may determine how risky consumers perceive physical food shopping or eating away from home and ultimately determine the attractiveness and loyalty toward OFD. Marketing managers in OFD are aware they are expected to respond to pandemic conditions. Building on (Leung & Cai, 2021) this requires them to consider the consumers' perception of the risk of infection associated with OFD. Respectively, marketing managers must adhere to value promises while repositioning toward more consumer-centric messaging. However, they must exercise caution in this regard, as the internet is diverse in terms of the credibility of information (Parsons Leigh et al., 2020). The amount and inconsistency of information and consumer messages can lead to confusion and may harm loyalty. In addition to delivering food quality and e-service quality in practice, marketing managers may also consider communicating value by acknowledging consumer problems due to COVID-19 and letting them know how OFD benefits new pandemic lifestyles. A message combining the value and quality of food, convenience, and pandemic safety may help strengthen consumer trust.

First-party and third-party OFD providers must ensure that their products and services avoid any association with COVID-19 infection (Meena & Kumar, 2022; Shankar et al., 2022). This must be executed through strict hygiene and testing protocols across their operation. In particular, delivery workers must be monitored thoroughly for their health and the functionality of the OFD service. Delivery staff may be exposed to the virus via asymptomatic customers, coworkers, and social circles outside work. Therefore, they have a higher risk of contracting and spreading viruses. Third-party providers are particularly vulnerable because their business is 100% OFD, and their reputation will suffer the most damage if their platform becomes a source of infection. Also, their situation is more precarious because they rely on multiple food providers with varying systems and levels of care devoted to pandemic safety.

Limitations and suggestions for future studies

This study extends the knowledge of OFD customer loyalty during the COVID-19 pandemic, at least for the three nations examined. However, some limitations deserve critical reflection. This includes the convenience sampling method, which limits the generalizability of the samples. Because the current study's data was primarily gathered from OFD participants in the regional centers of Bandung (Indonesia), Taichung (Taiwan), and New Zealand, the generalization may be restricted to surveyed regions. While there were no known systematic differences in OFD attitudes between the regions and their broader national contexts, such could exist. Also, cultural norms and consumer attitudes that may not have been present in the three countries examined could further limit the study's generalizability. Subsequent studies could also analyze customer loyalty across demographic subgroups. While the target market of OFD is generally younger, with disposable income, loyalty development might differ across gender and education groups. In particular, the perspectives and loyalty of middle-aged and elderly consumers have yet to be explored in detail.

A further literature gap that can be explored by future research should combine both cross-country comparisons and pandemic severity. In these studies pandemic severity should be treated as a predictor of behavior instead of an aspect to frame the study. This research would complement the work of (Prasetyo et al., 2021) and (Leung & Cai, 2021) who investigated consumer behavior with pandemic severity as a predictor in an individual country context.

This study does not include health risk factors, which became essential for OFD service providers as the pandemic worsened (Poon & Tung, 2022). Therefore, it is recommended that future loyalty studies build on (Suhartanto et al., 2022) and consider this factor as a predictor alongside pandemic severity. Also, to strengthen the robustness of models, future studies may implement brand image and customer involvement, primarily via online forums like social media, which potentially could be drivers of loyalty and satisfaction in e-commerce contexts. Finally, future studies should not ignore the perspectives of OFD service providers and employees involved in the delivery. As delivery people are exposed to a high risk of infection and spreading, a model exploring workplace loyalty as well as mental and physical well-being should be explored.

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Informed consent

All participants gave their informed consent for inclusion before they participated in the study

Data availability statement

The data that support the findings of this study are available from the corresponding author, [MR], upon reasonable request.

Institutional review board statement

This study was conducted in accordance with the Declaration of Helsinki, and was approved by the Human Ethics Committee of Lincoln University, New Zealand (2020–28).

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