Consumer Vulnerability After Pandemic Covid-19 on Using Mobile Health Apps

Christina Sudyasjayanti

Universitas Ciputra Surabaya, Indonesia

Email: christina.sudyasjayanti@ciputra.ac.id

*Correspondence

ABSTRACT

This research has highlighted the topic of consumer resilience after the COVID-19 pandemic. This research topic will enhance the subject of Health app users in Indonesia. This research aims to find out the answer to these research questions: the consumer vulnerability caused by the lowest technology literacy, the consumer resilience related to customers' trust and privacy concerns, and consumer adaptability caused by lack of personalization that will affect purchase satisfaction on Health Apps. Respondents of this research will be limited to 200 people who used Health Apps during 2020-2023. Those respondents will be selected from the four biggest provinces in Java. This research method uses linear regression analysis to determine the influence of consumer vulnerability and consumer resilience toward purchase satisfaction and the moderating effect of consumer adaptability upon consumer vulnerability toward purchase satisfaction and consumer resilience toward purchase satisfaction. The result showed that consumer adaptability did not strengthen the relationship between consumer vulnerability toward purchase satisfaction and consumer resilience toward purchase satisfaction. Alas, each variable significantly affected purchase satisfaction.

Introduction

The Indonesian Ministry of Health stated that more and more Indonesians are using health applications (Skowron & Kristensen, 2012). This is why the Ministry of Health regulates the mapping of the digitalization path of health care services in Indonesia by releasing the 2024 Health Digital Transformation Strategy Blueprint at the end of 2021 (Kirk & Rifkin, 2020). The digitalization of health services is carried out to simplify and facilitate access to services for the general public without reducing the quality and efficiency of health services. "Connection between key players in the health industry in a vast and diverse country like Indonesia is a must to ensure the success of digital transformation in health services," said the Chief Digital Transformation Office of the Indonesian Ministry of Health, Setiaji, in the APL Digital Summit 2022 discussion in Jakarta. Mainly since the COVID-19 pandemic occurred, which had

disrupted the mobility of many people. Boston Consulting Group (BCG) Managing Director Sumit Sharma said that the pandemic had significantly boosted the local health technology industry and increased health awareness. It was found that the applications most used by Indonesians were Halodoc (71 percent), then Alodokter (56 percent), Klik Dokter (30 percent), Good Doctor (13 percent), and YesDok (12 percent). The average user of the application is 18-50 years old. The changing trends in the digital health industry are also becoming more apparent. According to Sumit, pharmaceutical companies and hospitals with digitized operations will be able to keep pace with technological innovation and increase patient expectations for smoother and simpler health services.
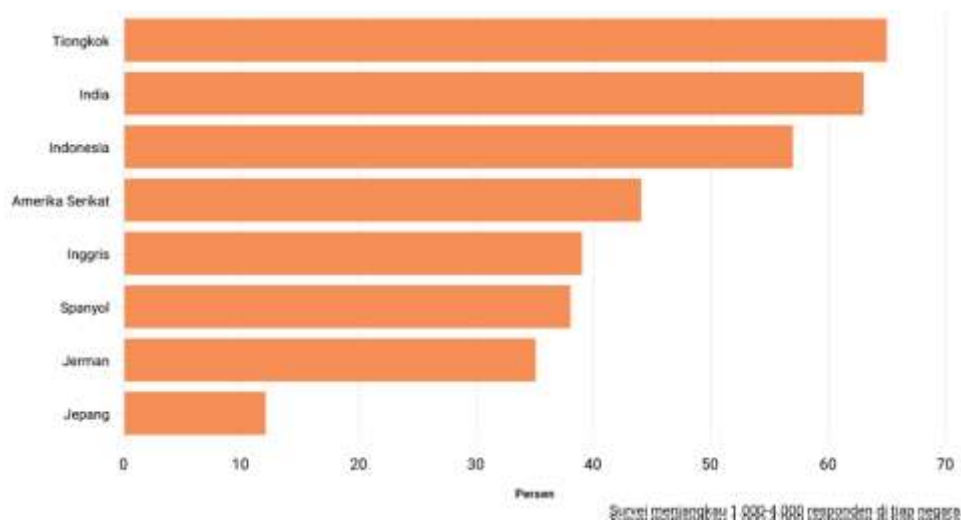

Figure 1. Global Health Application User Distribution Data
Source: databoks.id (2020)

While health apps have gained popularity in recent years, there are still several gaps and challenges among customers when using these apps. Some individuals may lack the technological skills to navigate and utilize health apps effectively. The complexity of specific apps, especially those with advanced features, can be a barrier for users unfamiliar with smartphones or digital platforms. The COVID-19 epidemic, lockdown, and social distancing measures have disturbed consumer purchasing and shopping patterns. As a result, customers have experimented with new channels and developed new habits. 75% of US customers tested new brands or channels during the crisis, according to a recent McKinsey & Co. study. Many of these consumers adopted "digital and contactless services, including curbside pickup, delivery, and buying online for in-store pickup" (Friedlingstein et al., 2020). When the crisis passed, most customers intended to keep shopping at multichannel or fully digital stores. Chinese "pandemic-led shifts to further online adoption and an increased focus on neighborhood and small-format stores have become an ongoing normal," according to a new analysis from market research firm Neilsen (Kursan Milaković, 2021). The recruitment of previously cautious internet shoppers could be the last potential behavioral shift brought about by the pandemic. (Standish & Bossi, 2020) makes the case that the epidemic has

encouraged "late adopters" to make their first online purchases using the innovation diffusion theory. During the pandemic, late adopters learn how to purchase online. The ease and security of online shopping may help them get over their misgivings and encourage them to keep shopping online once the pandemic is finished. Older consumers usually adopt Internet purchasing later (Liu, He, Chen, & Gao, 2019).

Besides, trust and privacy concerns became the point consumers became aware of. Many customers are concerned about the privacy and security of their health data when using apps. They worry about potential data breaches, unauthorized access to their personal information, or misuse by app developers or third parties (Skordoulis et al., 2018)v. These concerns can deter individuals from fully engaging with health apps. While "going digital" benefits individuals and society, there is also a greater risk of privacy invasion. Therefore, academic and professional groups are paying more attention to what might make a person more resilient to the adverse effects of these online privacy invasions (Roskam et al., 2021).

Considering earlier theories, it is evident that outside factors like the COVID-19 epidemic cause changes in consumer behavior. However, it is crucial to evaluate how customers' coping mechanisms for vulnerability, adaptation, and resilience to change due to online shopping contribute to their behavioral processes regarding retail/purchase satisfaction and repurchase. This is essential for businesses' following plans and communication strategies. Hence, this research aims to answer the following research questions: (1) Does consumer vulnerability caused by the lowest technology literacy affect purchase satisfaction with healthy apps? (2) does consumer resilience related to customers' trust and customer privacy concerns affect purchase satisfaction on Healthy Apps? (3) does consumer adaptability strengthen the relationship between consumer vulnerability and consumer resilience toward purchase satisfaction?

Research Methods

The population of this research was the citizens of 4 provinces in Java, Indonesia. They were DKI Jakarta, West Java, Central Java, and East Java, which have high populations compared to other provinces in Indonesia. Those respondents were classified based on their demographic data, such as age related to generation, domicile, and education. In order to find the specific respondents, this research used a purposive sampling technique with specific characteristics, such as using Mobile Health Apps from 2020 to 2023 and purchasing some products or services on Mobile Health Apps from 2020 to 2023. The questionnaire taken from the previous research: 14 items on consumer vulnerability adapted from (Skowron & Kristensen, 2012), five items on consumer resilience adapted from Connor & Davidson (2003), one item on consumer adaptability adapted from Milakovic (2021), and for purchase satisfaction consisted of three items that adapted from Wolter et al. (2017), Thomson (2006), and Chun and Davies (2006), while one item was developed by Milakovic (2021).

In order to find out the result of those hypotheses, this research used SEM PLS to analyze the statistical result. First, the validity test was done using the result of AVE's

value (Average Variance Extracted) of 0,5 and the value of the outer loading of 0,5. Secondly, the inner model was conducted to analyze the relationship among variables, which was measured through the value of R2. Lastly, path coefficients aimed to measure the answer to the hypotheses with specific criteria, such as the t-statistics value 1.96 with p-values of 0,05.
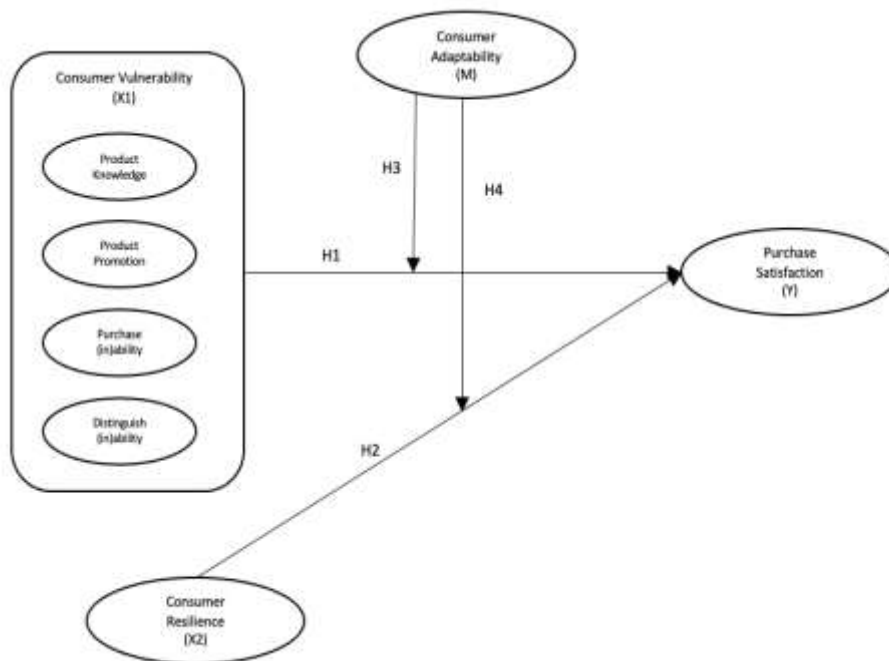

Figure 2. Research Model
Source: Data Processing

Results and Discussion

This research investigates the relationship between consumer vulnerability and consumer resilience during the COVID-19 outbreak toward purchase satisfaction moderated by consumer adaptability. The findings strengthen the previous study about consumer experience during the COVID-19 outbreak. The result showed that the moderation effect of consumer adaptability upon consumer vulnerability toward purchase satisfaction was rejected. The moderation effect of consumer adaptability on consumer resilience toward purchase satisfaction also exists (Kholifah, 2022).

There were 200 respondents in this study, consisting of 92 men and 108 women. The domicile is spread across four large provinces on the island of Java: 36% from DKI Jakarta, 28% from West Java, 19% from Central Java, and 17% from East Java. The highest average of respondents' educational background of respondents was a Bachelor's degree, 54%; next was High School, 31%; college, 12%; Master's Degree, 3%; and PhD/doctor, 1%. The most extensive generational distribution of respondents was Gen Y, aged 25-40 years 56%, 38% Gen Z (18-24 years), and the remaining 8% Gen X (aged 41-55 years and above).

Table 1
Respondents

Characteristic		N	%
Gender	Male	92	46
	Female	108	54
Domicile	DKI Jakarta	72	36
	West Java	57	28
	Central Java	37	19
	East Java	34	17
Education	High school	62	31
	College (D2/D3)	24	12
	Bachelor degree	107	54
	Master degree	5	3
	PhD/Doctor	2	1
Generation	Gen X (41 - >55)	15	8
	Gen Y (25–40)	110	56
	Gen Z (18–24)	75	38

Based on Table 2, respondents showed that their answers diverged, as shown by the Standard Deviation on each item. The highest standard deviation was shown by item X2.2. It implied that respondents who answered, "When under pressure, I can focus and think clearly," were diverse. On the contrary, the lower the standard deviation, the more similar the values on the items or the more accurate they are with the mean value.

Table 2
Validity Reliability

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)	Measurement Items *(measured on a 5-Point Likert Scale, where 1 means Strongly Disagree and 5 Strongly Agree)*
Consumer Adaptability (M)					M1: The pandemic situation provides an opportunity to learn several new ways of buying online.
Consumer Resilience (X2)	0,763	0,782	0,842	0,520	X2.1. When things seem hopeless, I never give up. X2.2: When under pressure, I can focus and think clearly. X2.3: I consider myself a strong person. X2.4: I can overcome unpleasant feelings. X2.5: I think I am in control of my life.

Christina Sudyasjayanti

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)	Measurement Items *(measured on a 5-Point Likert Scale, where 1 means Strongly Disagree and 5 Strongly Agree)*
Consumer Vulnerability (X1)	0,858	0,866	0,889	0,502	*Product Promotion* X1.6.: I often buy advertised products/services on Mobile Health Apps. X1.7. I often make purchases on Mobile Health Apps based on information from colleagues or family. X1.8.: I usually buy products/services available on Mobile Health Apps recommended by social media (IG et al., etc.). *Purchase Ability* X1.9: When purchasing a product/service on Mobile Health Apps, I often have many other alternatives outside the application. X1.11.: I can afford to buy what I want on Mobile Health Apps. *Distinguish Ability* X1.12.: I often buy replacement goods/services using mobile health apps that are unavailable in conventional stores. X1.13.: When I buy a product/service on Mobile Health Apps, I usually know if the information is false. X.1.14: When I buy products or services on Mobile Health Apps, I can usually distinguish which marketing methods are fraudulent.
Purchase Satisfaction (Y)	0,896	0,901	0,928	0,763	Y1: I think the market approach taken by Mobile Health Apps that I used during the pandemic met my expectations. Y2: I am satisfied with the

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)	Measurement Items (measured on a 5-Point Likert Scale, where 1 means Strongly Disagree and 5 Strongly Agree)
					Mobile Health app service I used during the pandemic. Y3: I will recommend the Mobile Health Apps I used during the pandemic to others. Y.4: My purchasing experience with Mobile Health Apps during the pandemic was very satisfying.

According to CFA analysis, not every item has significant factor loadings above the advised level of > 0.50. This was true for the consumer vulnerability product knowledge dimension (five items), and the consumer vulnerability distinguishes ability dimension (one item). The minimal two manifest variables required for each component and the low factor loadings meant that these items could not be included in the analysis. This necessitated removing the customer vulnerability variable related to product knowledge from subsequent CFA analyses.

Table 3 presents the CFA findings.

	Item	Consumer Resilience (X2)	Consumer Vulnerability (X1)	Purchase Satisfaction (Y)
	Consumer Vulnerability			
X1.11	I can afford to buy what I want on Mobile Health Apps.		0,722	
X1.6	I often buy advertised products/services on Mobile Health Apps.		0,760	
X1.7	I often make purchases on Mobile Health Apps based on information obtained from colleagues or family.		0,784	
X1.8	I usually buy products/services available on Mobile Health Apps recommended by social media (IG et al., etc.).		0,675	
X1.9	When purchasing a product/service on mobile health apps, I often find many alternatives outside the application.		0,650	

Item		Consumer Resilience (X2)	Consumer Vulnerability (X1)	Purchase Satisfaction (Y)
X1.12	I often buy replacement goods/services in Mobile Health Apps, which are unavailable in conventional stores.		0,707	
X1.13	When I buy a product or service on Mobile Health Apps, I usually know if the information is false.		0,655	
X1.14	When I buy a product or service on Mobile Health Apps, I can usually distinguish which marketing methods are fraudulent.		0,703	
Consumer Resilience				
X2.1	When things seem hopeless, I never give up.	0,682		
X2.2	When under pressure, I can focus and think clearly.	0,528		
X2.3	I consider myself a strong person.	0,778		
X2.4	I can overcome unpleasant feelings.	0,778		
X2.5	I think I am in control of my life.	0,804		
Purchase Satisfaction				
Y1	I think the market approach taken by Mobile Health Apps that I used during the pandemic met my expectations.			0,875
Y2	I am satisfied with the mobile health app service I used during the pandemic.			0,876
Y3	I will recommend the Mobile Health Apps I used during the pandemic to others.			0,844
Y4	My purchasing experience with Mobile Health Apps during the pandemic was very satisfying.			0,898

This research found that not all of the designed hypotheses were answered. This research found that the p-value of the influence of consumer vulnerability on purchase satisfaction was 0.000, meaning that H1 was accepted. This is in line with research conducted by Shi et al. (2017) and Stewart & Yap (2020), which state that the higher a person's level of technological literacy, the more influence it will have on the purchase

satisfaction of the product or service chosen. In this case, three dimensions of consumer vulnerability significantly influence purchase satisfaction of Mobile Health apps, including product promotion, purchase ability, and distinguish ability.

Furthermore, Table 4 showed that the p-value of consumer resilience towards purchase satisfaction was 0.000, meaning that H2 was accepted and supported by previous research (Ningsih et al., 2021). The background knowledge consumers possess to use a product or service in certain situations, such as the COVID-19 outbreak, requires consumers to be able to adapt to the disruption that occurs. So, if consumers have enough information about existing threats, they will not be mistaken when consuming the product. The educational background of the respondents supported this research, the majority of whom had bachelor's degrees (108 respondents), which was quite influential in their purchasing decisions regarding the use of mobile health apps.
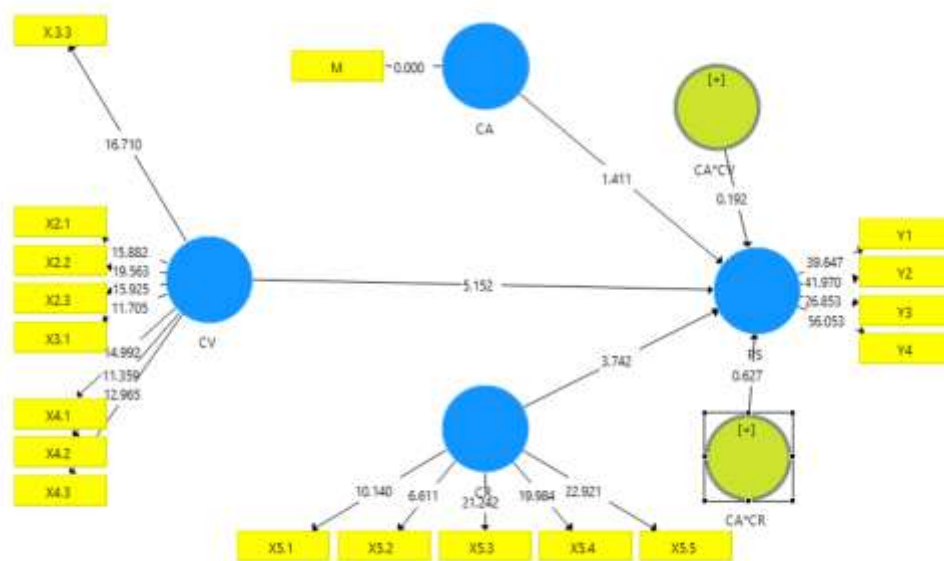

Figure 3. Model Analysis

Consumer adaptability played a moderating role in the influence of consumer vulnerability on purchase satisfaction and consumer resilience on purchase satisfaction; however, in this study, the moderating effect did not occur. This can be seen from the p-value of the moderating influence of consumer adaptability on the relationship between consumer vulnerability and purchase satisfaction of 0.531 or greater than 0.05, and the t-statistic < 1.96, so H3 was rejected. This is similar to previous research by Milakovic (2021), where consumer adaptability weakens the influence of consumer vulnerability on purchase satisfaction. This can be influenced by various things, as discussed in the SCT theory, such as the influence of the COVID-19 outbreak leading to changes in consumer psychological behavior. As previously said, the pandemic resulted in significant behavioral and psychological changes due to consumers adjusting to the new environmental conditions through coping and reaction (Kirk & Rifkin, 2020). Likewise, the moderating influence of consumer adaptability on the relationship between

consumer resilience and purchase satisfaction is 0.847 or greater than 0.05, and the t-statistic < 1.96; therefore, H4 was rejected.

Table 4
Hypotheses Result

	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Note
CA*CR -> PS	0,067	0,627	**0,531**	H3: not supported
CA*CV -> PS	0,095	0,192	**0,847**	H4: not supported
CR -> PS	0,083	3,742	**0,000**	H2 : supported
CV -> PS	0,082	5,152	**0,000**	H1 : supported

Conclusion

In this research, consumer adaptability, especially the use of technology among most respondents from Gen Y, did not strengthen the influence of consumer vulnerability or resilience on purchasing Mobile health Apps. However, looking at each behavior, it will be seen that each consumer's vulnerability directly influences Mobile Health Apps' purchase satisfaction. Moreover, consumer resilience directly influences purchase satisfaction with mobile health apps. Further research can be carried out regarding instruments in the product knowledge consumer vulnerability dimension whose AVE value is less than 0.5 or invalid and unreliable. Apart from that, this research can be carried out on objects other than Mobile Health Apps, such as OTT Services or other consumer service applications.

Bibliography

Friedlingstein, Pierre, O'Sullivan, Michael, Jones, Matthew W., Andrew, Robbie M., Hauck, Judith, Olsen, Are, Peters, Glen P., Peters, Wouter, Pongratz, Julia, & Sitch, Stephen. (2020). Global carbon budget 2020. *Earth System Science Data Discussions*, *2020*, 1–3.

Kholifah, K. (2022). PRODUCT KNOWLEDGE DAN PRODUCT PROMOTION TERHADAP PURCHASE SATISFACTION DAN REPURCHASE INTENTION SELAMA PANDEMIC COVID-19. *Journal of Digital Business and Management*, *1*(1), 50–62.

Kirk, Colleen P., & Rifkin, Laura S. (2020). I will trade your diamonds for toilet paper: Consumer Reacting, coping, and Adapting Behaviors in the COVID-19 Pandemic. *Journal of Business Research*, *117*, 124–131.

Kursan Milaković, Ivana. (2021). Purchase experience during the COVID-19 pandemic and social cognitive theory: The relevance of consumer vulnerability, resilience, and adaptability for purchase satisfaction and repurchase. *International Journal of Consumer Studies*, *45*(6), 1425–1442.

Liu, Xiaodong, He, Pengcheng, Chen, Weizhu, & Gao, Jianfeng. (2019). Improving multi-task deep neural networks via knowledge distillation for natural language understanding. *ArXiv Preprint ArXiv:1904.09482*.

Ningsih, Kursiah Warti, Aryantisningsih, Dwi Sapta, Asnel, Roza, Parlij, Winda, & Pramulia, Rahmi. (2021). Situasi Kesehatan Masyarakat Di Desa Kemang Indah Tahun 2021. *Health Care: Jurnal Kesehatan*, *10*(1), 144–149.

Roskam, Isabelle, Aguiar, Joyce, Akgun, Ege, Arikan, Gizem, Artavia, Mariana, Avalosse, Hervé, Aunola, Kaisa, Bader, Michel, Bahati, Claire, & Barham, Elizabeth J. (2021). Parental burnout around the globe: A 42-country study. *Affective Science*, *2*(1), 58–79.

Skordoulis, Michalis, Kaskouta, Ioanna, Chalikias, Miltiadis, & Drosos, Dimitris. (2018). E-commerce and e-customer satisfaction during the economic crisis. *Journal for International Business and Entrepreneurship Development*, *11*(1), 15–29.

Skowron, Lukasz, & Kristensen, Kai. (2012). The impact of the recent banking crisis on customer loyalty in the banking sector: Developing versus developed countries. *The TQM Journal*, *24*(6), 480–497.

Standish, J., & Bossi, M. (2020). How will COVID-19 change the retail consumer? *Dublin: Accenture. Https://Www. Accenture. Com/_acnmedia/PDF-126/Accenture-COVID-19-Retail-Consumer-Resarch-Wave-Four-POV. Pdf, Accessed*, p. *14*, 2021.