IMPACT OF COVID-19 ON ONLINE SHOPPING BEHAVIORS OF PEOPLE IN DANANG CITY (VIETNAM)

Tin Q. Pham[1], Thao U. P. Pham[2] and Hai M. Nguyen[2]

[1]*Faculty of Statistics and Informatics, University of Economics - The University of Danang (Vietnam), Danang, Vietnam. E-mail: tinpq@due.edu.vn*
[2]*Faculty of Business Administration, FPT Greenwich Centre, FPT University, Danang, Vietnam. E-mail: thaopup@fe.edu.vn; hainm24@fe.edu.vn*

Abstract: The COVID-19 has exposed the whole world to severe consequences and uncertainties, which cannot be only defined as mortality but also in terms of people's daily livelihood and economic despair. In addition, enterprises are in extreme distress and facing enormous challenges due to strong containment measures taken by governments for mitigating coronavirus outbreak. Therefore, in finding ways to adapt to restrictive lockdown rules and social-distancing practices, leveraging e-commerce is rapidly implemented by businesses to boost sales and maintain public safety amid the epidemic. This research aims to measure the impacts of COVID-19 on the online shopping behaviors of Danang's citizens (Vietnam) by applying a quantitative model. Online questionnaires were released and recorded with 429 respondents in Danang city during the second outbreak of coronavirus in Vietnam. Precisely, the analysis results present that SARS-CoV2 factors including policy barriers, disease prevention, perceived severity and cyberchondria, influence behaviors of online shopping, but inferiorly compared to factors of economic benefits. Especially in this article, a new theoretical contribution is proposed by adding a policy barrier factor with three components from authors. The empirical results also indicate the effects of policy barrier from Danang's government on e-shopping behaviors.

Keywords: Covid-19; Online shopping behavior; Economic Benefits; Policy barriers.

1. INTRODUCTION

COVID-19 has become a global pandemic impacting people's daily life around the world from the beginning of 2020 (WHO, 2020a). In universal history, the Covid-19 era is also considered as one of the most significant crises and triggers a tremendous

shock for healthcare professionals, governments and businesses. Precisely, many nations and politicians took and enforced rigorous quarantines, lockdowns and other actions to mitigate the outbreak of the SARS-CoV2 virus and the deterioration of the healthcare system (WHO, 2020b). Firms and industries are thus facing severe challenges when people have to stay at home and practice social distancing. Especially, the mitigation measures highly impact on activities of the tourism, retail, transportation and agriculture sectors (Stephany *et al.*, 2020).

Owing to the strong development of technology, new media and increasing penetration of the Internet, e-commerce has played a key pillar both within and across the countries for fighting against COVID-19 and preserving business activities, social engagements and consumption. Online shopping is helping to minimize the risk of new contagions, allow individuals to connect and companies to still collaborate and interact with their customers, despite being physically isolated (Sahi and Salman, 2017; Stanciu *et al.*, 2020; Bhatti *et al.*, 2020; Ali, 2020; Pantano *et al.*, 2020). Furthermore, e-commerce can assist humans to retain their jobs and even generate new economic opportunities in a catastrophic situation. For example, Amazon has confirmed that 175,000 workers will be employed in the US during this crisis (WTO, 2020).

It is crucial to not only commit short-term measures in response to the pandemic but also start to estimate what recent changes would become more long-lasting as times turn eventually into less volatile. The transition to online shopping by consumers is one of those shifts for adapting to the prevailing circumstance (Sheth, 2020). For maintaining customer loyalty in the electronic marketplace, the marketing literature and in practice should be sharply focused along with the accelerated growth of e-consumer. In fact, Vietnam is not an exception for the substantial expansion of e-commerce, expected to reach USD 15 billion concerning revenue in 2020 (VietnamTimes, 2020). According to UNCTAD (2019), Vietnam is appraised as the fastest developing digital economy in Southeast Asia and the online sales resulted from its e-commerce market present evidence of new business possibilities and gain more attractions from domestic and international investors.

In particular, the resurgence of COVID-19 originated from Danang city, as known as the second wave of the pandemic in Vietnam from August 2020, have prompted and forced not only Danang's businesses but also the national enterprises to pay more attention to their online shopping platforms. Hence, this study primarily examines the determinants of online shopping behaviors over the COVID-19 epidemic in the case of Danang city, where had been suffered serious consequences caused by the second outbreak. Additionally, it aims to reconfirm the influence of COVID-19 by proposing a new factor, called policy barriers, and surrounding factors to consumer online shopping behaviors. Besides, this

research will provide a clear indication of what firms should focus on and alter to enhance their online performances and how to conform to the dynamics.

The opinions from citizens around Danang city are gathered by using the Google form to release the online questionnaires. The primary dataset will be processed by applying descriptive statistics, factor analysis and multiple linear regression model to bring concrete proofs of significant factors affecting customers' behaviors on the Internet. This article is divided into five sections. Literature reviews including conceptions and theoretical framework attached to the proposed research model will be placed after this introduction. The third part will specifically mention the research methods of collecting and analysing the database. After that, the results will be interpreted and discussed in Section 4. Last but not least, the closing consists of limitations and implications for business and further insights for the next research.

2.   LITERATURE REVIEW

2.1. Online Shopping

According to Jarvenpaa and Todd (1997), people can do their own research and purchase goods or services online owing to the establishment of the World Wide Web, advancement of the Internet and higher demand for personal computers as early as 1992. Shopping online has emerged as a type of e-commerce and one of the most popular Internet applications providing a plethora of purchasing opportunities for consumers (Butler and Peppard, 1998; Bourlakis *et al.*, 2008). Indeed, there are certain advantages of e-shopping to explain why people prefer this kind over the traditional way (Falk *et al.*, 2005; Pheba, 2008; Javadi *et al.*, 2012; Sahi and Salman, 2017; Bucko *et al.*, 2018). Besides, Internet shopping convey sales challenges for retailers to maintain customer interactions and increase their satisfaction (Rowley, 1998; Jaffa, 2016; Pantano *et al.*, 2020).

2.2. Coronavirus Pandemic

An excruciating respiratory syndrome coronavirus 2 (briefly called SARS-CoV2) inducing a cluster of respiratory infections (COVID-19) in Wuhan, China was identified on 7 January 2020 and quickly and widely spread all over the world (WHO, 2020). It leads to the number of positive cases with COVID-19 disease is increasing day by day. Precisely, the Coronavirus is affecting 219 countries and territories with over two million deaths out of over 100 millions reported cases (Worldometer, 2021). The current outbreak dynamics apparently show evidence of sustained human-to-human transmission (Stoecklin *et al.*, 2020). In consequence, rapid disclosure of the information is prioritized and extraordinary public health measures have to be implemented to reduce and monitor

pandemic of coronavirus such as isolation, screening, restricting movement, or suspending unnecessary activities (Anderson *et al.*, 2020; Wang *et al.*, 2020).

2.3. Online Shopping Behavior

Kotler *et al.* (2005) mentioned that consumer behavior is a complex area studying how people as individuals or groups or organizations choose, organize and act to address their products or services demand and understand what makes them change their purchasing decision.

Research into online environments and online consumer behavior has recently drawn much more attention along with the initiation of Internet and information technologies. UrRehman *et al.* (2011) suggested that privacy and security (secure payments and valid transactions) are two major factors influencing online purchasing behaviors. Besides, they also explained why people prefer shopping online over going to stores by applying descriptive and inferential statistics to conclude that psychological factors, social factors and emotional factors (prices, perceived ease of use, perceived usefulness, convenience recommendations, attitudes) make consumers feel hesitation from e-purchasing.

Following the research of Moshrefjavadi *et al.* (2012), they investigated the main factors influencing online shopping behaviors based on 200 respondents from Iranian online stores under the complexity of socio-technical phenomenon at that time. The results showed that perceived risks including financial risks and non-delivery risk superiorly affect attitude toward online shopping compared to infrastructural variables and return policy. In addition, they explored that consumers' online shopping behaviors are positively impacted by domain-specific innovativeness, subjective norms and attitude toward online shopping, tested by the regression model.

Once again, in the study of Ahmed *et al.* (2017), the authors also identified that domain-specific innovativeness and perceived benefits have a positive impact on online consumer purchasing behaviors. Moreover, shopping orientations consisting of impulse-purchase orientation, brand orientation and quality orientation… have emerged as an important element to drive the interest in online shopping in Pakistan.

Recently, Farah (2020) conducted quantitative research with 300 Somali consumers to indicate the gradual increase in demand for online commodities. However, they have just considered convenience as the most significant factor affecting their online shopping behaviors, followed by reputation and perceived ease of use. Furthermore, Somali people don't feel safe and comfortable while shopping online.

In global history, there have been several epidemiological outbreaks such as Ebola, SARS, MERS, swine flu, and dengue fever influencing prominently to consumer behavior and health risk mitigation behavior (Balinska and Rizzo, 2009; Rubin *et al.*, 2009; Goodwin

et al. 2009; Timpka *et al.*, 2014; Gamma *et al.*, 2017; Wilder-Smith and Freedman, 2020). Similarly, scholars applied some behavior models to understand the human shopping behaviors in response to the COVID-19 pandemic, (Farooq *et al.*, 2020; Laato *et al.*, 2020; Gamma *et al.*, 2020; Miri *et al.*, 2020; Watanabe & Omori, 2020).

For instance, Ali (2020) used secondary data from the market of Samsung electronics durable goods in Iraq to conclude the attraction of online shopping owing to the COVID-19 pandemic. In order to adapt to restricted circumstances, innovation and investment in online platforms are more encouraged and embraced with technology and internet penetration.

One more piece of evidence, Watanabe & Omori (2020) illustrated the dramatic changes in online consumption of goods and services by analyzing credit card transaction data in Japan. The COVID-19 infections accelerate the switches to online spending for both those who were already acquainted and newbies for online shopping, especially youngsters are more likely to pick internet shopping than older people. Likewise, the study also came up with the idea that people would not return to offline consumption even if the pandemic had been controlled.

By applying the PLS-SEM model on primary data from 211 Finnish online consumers and thanks to the stimulus-organism-response (S-O-R) scheme, Laato *et al.* (2020) revealed that unusual purchase intention is violated by cyberchondria, information overload and voluntary self-isolation under the COVID-19 circumstance.

This paper will summarize all existing literature to propose the following theoretical framework (Figure 1) with six determinants of online shopping behaviors
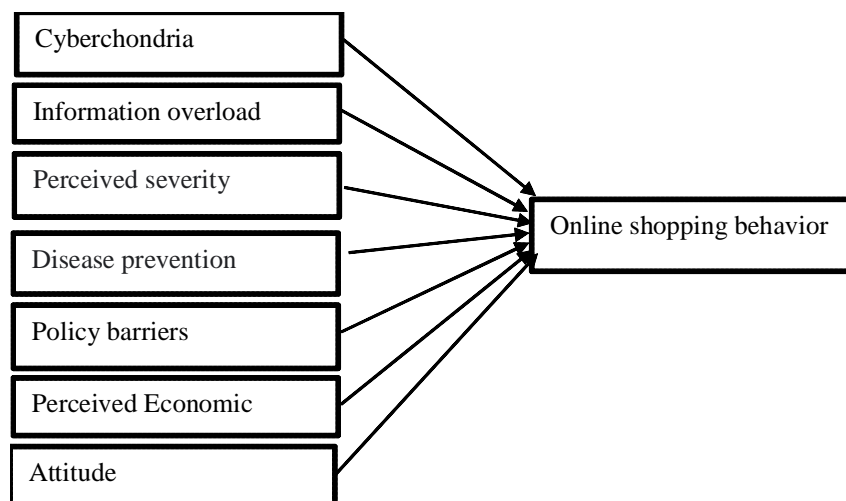

Figure 1: The proposed research models

(cyberchondria, information overload, perceived severity, disease prevention, perceived economic benefits and attitude toward online shopping) and policy barriers are remarkably proposed represented as a COVID-19 factor.

2.4. Cyberchondria

Cyberchondria is combined from the terms "cyber" and "hypochondriasis" introduced by the UK press in the middle of the 1990s (Loos, 2013). It was extensively mentioned in social media and academic publications. Cyberchondriac behavior is referred to repetitive tendencies for online searching and reading specific medical information. Cyberchondria can be defined from anxiety, uncertainty as well as sensitivity with too many ambiguous and inconsistent information sources. Besides, cyberchondria is known as an internet commodity, as online sources may provide a myriad of information for medical checking in order to reduce or prevent severe consequences of health. Hence, people intend to trigger their online shopping behaviors according to understanding and awareness of the SAR-CoV2 (functional impairment, public health implications and healthcare reinforcements) strongly affected by cyberchondria (Vismara *et al.*, 2020; Farooq *et al.*, 2020).

H_1: *Cyberchondria positively influences online shopping behavior.*

2.5. Information Overload

Information overload is measured as the decrease in response rates when the input exceeds the processing capabilities of users (Rodriguez *et al.*, 2014). Information overload thus impacts information quality which may alter the decision-making process and further to the future intention of purchasing. Gross (2014) interpreted principal decision-making models to emphasize the influence of perceived information overload on consumer purchase intent. Additionally, he suggested that e-commerce merchants should control the flow and amount of information to limit online buying risk and increase customer interactions. Farooq *et al.* (2020) mentioned that people don't have enough time and cannot be able to absorb plenty of online and offline information concerning COVID-19. The information overload would diminish the self-efficacy and response efficacy by limited time to process available information.

H_2: *Information overload positively influences online shopping behavior.*

2.6. Perceived Severity

Ling *et al.* (2019) used Protection Motivation Theory and linear regression model for cross-sectional data to identify the predictors of intention to take seasonal influenza vaccines. The analysis results from 574 correspondents in the US indicated that perceived

severity significantly affected the intent of vaccination. Similarly, the outbreak of coronavirus has emerged a lot of cases of cyberchondria because of the specific health problems or symptoms, leading to a surge of perceived severity. Therefore, it leads to self-isolation and takes health enforcements to mitigate the vulnerability impacting online shopping behaviors (Farooq *et al.*, 2020).

H_3: *Perceived severity positively influences online shopping behavior.*

2.7. Disease Prevention

Rubin *et al.* (2009) conducted a telephone survey in England, Scotland and Wales with 997 young participants for examining English spoken people's behaviors towards the swine flu outbreaks. They proposed that knowing the facts and taking suitable precautions are effective measures to protect yourself and others, and further avoid the spread of viruses and other infections. Accordingly, the study of Laato *et al.* (2020) is quite interesting by collecting cross-sectional data of Finnish players of Pokémon GO location-based games to assess the increasing intention of self-regulation to stay at home and prevent physical contact in public. Thus, online interactions should be enhanced against the COVID-19 pandemic.

H_4:   *Disease prevention positively influences online shopping behavior.*

2.8. Policy Barriers

Policy barriers contain two main elements in the questionnaire proposed by the authors of this research. Quarantine is the most useful measure to prevent the spread of COVID-19 outbreaks because it is transmitted through contact with people (WHO, 2020a). Some gathering activities are not essential such as schools, cafes, bars that are closed or there is a restriction on eating directly at the counter. These policies are enacted by the government to protect the health of the population, prevent disease, and avoid pandemic outbreaks (Stoecklin *et al.*, 2020). The interventions and adjustments by governments such as forcing people to stay at home and not being out if not necessary, wearing medical masks all the time in public, physically distancing as well as keep cleaning and sanitizing should be worked together for combating the SARS-CoV2 epidemic. Farooq *et al.* (2020) proposed that online approaching with more incentives would reduce infections, leading to the motivations of all businesses for improving online platforms.

H_5: *Policy barriers positively influence online shopping behavior.*

2.9. Perceived Economic benefits

Customers may reduce their shopping times and efforts for Internet purchasing, confirmed by Schaupp & Belanger (2005) and Chen *et al.* (2010).

Ur Rehman *et al.* (2011) stated that e-commerce is intensively developing and more beneficial as compared to conventional shopping in terms of convenience and perceived ease of use, studied in Pakistan. The penetration of the internet and e-commerce industry stimulates the online transactions and development of online payment systems (Ahmed *et al.*, 2017). Besides, Teo (2002) indicated that people can certainly make the best buy by searching for more information and comparing prices among sellers to end up with the lowest price and the same quality. Additionally, Anckar & D'Incau (2002) advocate that eight features consisting of time-critical, spontaneous, entertainment, efficiency, mobility-related, cost-saving, convenience, and familiarity influencing Finnish consumers' online shopping behaviors towards mobile services. Moreover, Anandarajan (2000) stressed that perceived usefulness is positively affiliated with online purchasing.

H_6: *Perceived economic benefits positively influence online shopping behavior.*

2.10. Attitude toward online shopping

Attitude toward online shopping is characterized as an individual feeling expression of an e-shopping behavior and attitudes are clearly correlated to behaviors, developed from Fishbein & Ajzen (1975 & 1980). Jarvenpaa & Todd (1997) found a strong connection between attitudes and intention towards online shopping intention via four main components such as product value, shopping experiences, service quality and perceived risks. Furthermore, Teo (2002) showed that the attitudes toward Internet shopping from Singapore's citizens had been changed due to the advancement of the worldwide webs as a crucial distribution channel for most successful businesses, derived from the Technology Acceptance Model and the Theory of Planned Behavior (Taylor & Peter, 1995; Bauer *et al.*, 2005). Later on, Jun & Jaafar (2011) concluded that only marketing mix and reputation have a significant impact on consumers' attitude to adopt online shopping in China by using the primary data. Hence, the intention of switching to online consumptions is influenced by their attitudes.

H_7: *Attitude positively influences online shopping behavior.*

3. RESEARCH METHODOLOGY

3.1. Procedure

The research is conducted step by step to test all proposed hypotheses and further answer research questions. Firstly, by examining Cronbach's Alpha coefficients, developed by Cronbach (1951), it can be presented how closely correlated the set of components for each factor and used for testing the reliability or internal consistency of Likert scale questions from the survey. Next, applying Exploratory Factor Analysis – EFA is to

define which underlying factors are measured by manifest variables. Last but not least, the Multiple Linear Regression Model is implemented for testing research hypotheses, specifically applying the OLS regression model to check the reliability and validity of the model with five assumptions.

3.2. Data Collection

The primary data is collected by online surveying residents in Danang city (Vietnam). The questionnaires had been published including 29 main questions related to determinants of online shopping behaviors during the COVID-19 pandemic. The initial sample size is 481 participants, but some observations having missing data should be excluded. As a result, the remaining sample size is 429, distributed according to the sample structure by gender, age, education level, income, occupation in Table 1.

Table 1: The Demographic Information of Survey Participants

	Variables	*Frequency (N)*	*Percent (%)*
Gender	Male	202	47.1
	Female	227	52.9
Age (Years)	Under 20	40	9.3
	20 – 30	226	52.7
	31 – 40	104	24.2
	41 – 50	52	12.1
	Over 50	7	1.6
Education level	High school	14	3.3
	College	75	17.5
	University	238	55.5
	Postgraduate	102	23.8
Monthly income (Million VND)	Under 5	179	41.7
	5 – 9	115	26.8
	9 – 20	99	23.1
	Over 20	36	8.4
Occupation	Business owner, business manager	33	7.7
	Administrative officers and employees in business units	109	25.4
	State administrative officials and employees	82	19.1
	Direct production workers	34	7.9
	Self-employed in household production	26	6.1
	Other	145	33.8
	Total	429	100

According to Comrey & Lee (1992) and Hair *et al.* (2010), they provided the specific guidance in defining the adequacy of sample size as following: 100= poor, 200 = fair, 300 = good, 500 = very good, 1,000 or more = excellent. So, 429 is quite good to ensure the representative of Danang's citizens.

As can be seen from Table 1, most respondents belong to the 20-30-year-old group (accounted for 52.7%) considered as the most dynamic generation for quickly adapting to the progress of the Internet and fluctuations over the world. Also, they are well-intellectual with 55.5% having university degrees and higher education. However, the monthly incomes are quite low approximately 70% of total participants gaining under 10 million VND. It could be because the income level specifically in Danang city (or in the middle area of Vietnam in general) is quite low compared to Hanoi (the north) and Ho Chi Minh cities (the south). Furthermore, most of them are working as administrative officers, F&B and service industry. Therefore, they have become unemployed under the social-distancing situation due to the shutdown of stores and restaurants.

4. DATA ANALYSIS

4.1. Reliability Testing

Appendix A shows Cronbach's Alpha values of all factors including dependent variable and independent variables. They are entirely greater than 0.6: Cyberchondria (0.676); Information overload (0.767); Perceived severity (0.791); Disease prevention (0.825); Policy barriers (0.906); Perceived Economic benefits (0.786); Attitude (0.854); Online shopping behavior (0.870). All Corrected item-total and Correlation coefficients of 8 groups are greater than 0.3, indicating that all component questions can be used to identify the latent factors in the next step.

4.2. Exploratory Factor Analysis (EFA)

Table 2: Summarized Result of Exploratory Factor Analysis (EFA)

Factors	*KMO*	*Bartlett's Test (Sig)*	*Initial Eigenvalues*	*Rotation Sums of Squared Loadings (%)*
1. Benefits – Attitude	.856	.000	6.753	66.793
2. Policy barriers			2.850	
3. Disease prevention			2.385	
4. Perceived severity			1.502	
5. Information overload			1.414	
6. Cyberchondria			1.127	

Factors	KMO	Bartlett's Test (Sig)	Initial Eigenvalues	Rotation Sums of Squared Loadings (%)
7. Online shopping behavior	.860	.000	3.294	65.889

In Table 2 and Appendix B, EFA results show that the factors affecting Danang consumers' online buying behavior decrease from 7 factors according to the proposed research framework (Figure 1) to 6 factors with the KMO value (0.856) within the scope [0.5 – 1] and Sig. value of Bartlett's Test is 0.000 less than the significance level 1% along with Initial Eigenvalues are greater than 1. Therein, Benefits – Attitude (6.753) is integrated from 2 original factors as Economics benefits and Attitude; Policy barriers (2.850); Disease prevention (2.385); Perceived severity (1.502); Information overload (1.414); Cyberchondria (1.127). Furthermore, the Rotation Sums of Squared Loadings value is 66.793% greater than 50% and all loading values of 6 factors are greater than 0.5.

Similarly, the result of EFA analysis for online buying behavior has the KMO value of 0.860 within the scope [0.5 – 1] and Sig. value of Bartlett's Test is 0.000 lower than 1% - significance level. The Initial Eigenvalues value is 3.294 greater than 1 in accordance with 5 items that have loading values higher than 0.5 and the Rotation Sums of Squared Loadings value is 65.889% greater than 50.

The results of Exploratory Factor Analysis illustrate that factors influencing online purchasing behavior as well as Danang consumers' behaviors towards Internet shopping itself are reliable.

- Factor 1: Benefits – Attitude (7 component questions)
- Factor 2: Policy barriers (4 component questions)
- Factor 3: Disease prevention (4 component questions)
- Factor 4: Perceived severity (3 component questions)
- Factor 5: Information overload (3 component questions)
- Factor 6: Cyberchondria (3 component questions)

4.3. Multiple Regression Model

4.3.1. Adjusted Research Model

In Appendix 2, Rotated Component Matrix depicts that six factors are impacting the E-shopping behaviors of Danang's people instead of the seven determinants proposed at the beginning. Figure 2 has been fixed and represented the adjusted research model.
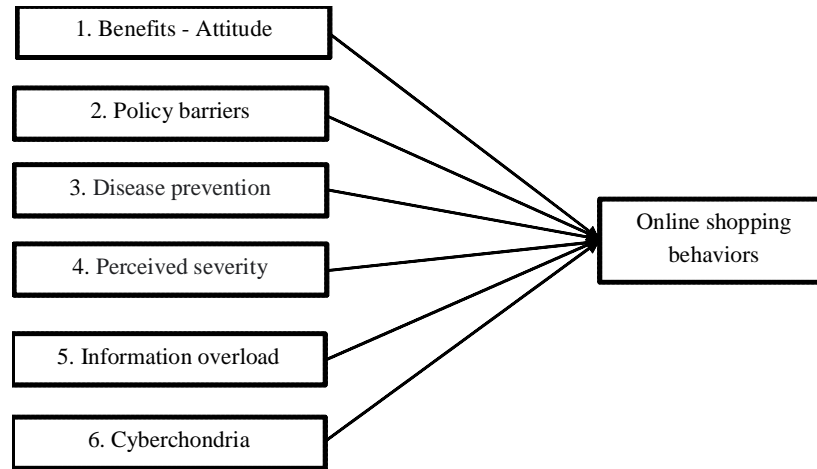
Figure 2: The adjusted Research models

Therefore, the research hypotheses have been modified concerning the fixed research model (Figure 2) as following:

- H_1: Benefits and Attitude positively influence Online shopping behavior
- H_2: Policy barriers positively influence Online shopping behavior
- H_3: Disease prevention positively influences Online shopping behavior
- H_4: Perceived severity positively influences Online shopping behavior
- H_5: Information overload positively influences Online shopping behavior
- H_6: Cyberchondria positively influences Online shopping behavior

4.3.2. Econometric Research Model

The econometric model aligning with the adjusted research model (Figure 2) is illustrated in Equation (1) below for studying the factors that impact online shopping behaviors:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon \tag{1}$$

Besides, the derived Equation (2) uses to analyze the separate influence of the COVID-19 factor on Internet shopping behaviors of Danang's citizens:

$$Y = \beta_0 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon \tag{2}$$

In which:

Y: Online shopping behaviors.

X_1: Benefits - Attitude; X_2: Policy barriers; X_3: Disease prevention; X_4: Perceived severity; X_5: Information overload; X_6: Cyberchondria.

β_0: The Constant Coefficient

β_i (i=1-6): The Unstandardized Coefficients X_i (Benefits – Attitude; Policy barriers; Disease prevention; Perceived severity; Information overload; Cyberchondria

ε: The Residuals of the model (1) and (2)

4.3.3. Results of Regression Model

Table 3: The results of Testing Model (1) and (2)

Model	(1)		(2)	
	Standardized Coefficients Beta	*Sig.*	*Standardized Coefficients Beta*	*Sig.*
(Constant)	-	1.000	-	1.000
Benefits – Attitude	.711	.000		
Policy barriers	.133	.000	.133	.004
Disease prevention	.247	.000	.247	.000
Perceived severity	.136	.000	.136	.003
Information overload	.012	.688	.012	.792
Cyberchondria	.104	.001	.104	.024
F-test (ANOVA)	111.721	.000	10.253	.000
R Square	.614	.108		

Dependent Variable: Online shopping behavior

From Table 3 (extracted from Appendix C), Sig. values of F-statistics from Model (1) and (2) are approximately 0.000 lower than the significant level of 1%, implied that both models are statistically significant and existed. In other words, it has at least one of the six factors in the first model and at least one of five factors in the second model will influence to online shopping behaviors of people in Danang (Vietnam).

The next step is testing assumptions for both model (1) and (2) by using the OLS method. Based on the results from Appendices, all assumptions are confirmed with the significance level of 1%.

- Assumption 1 (A_1): Model (1) and (2) have the residuals (Ui) that are normally distributed, confirmed by One-Sample Kolmogorov-Smirnov Test (Appendix D).
- Assumption 2 (A_2): The two models have the mean (Estimation) of the residuals (U_i) equal to 0, tested by the One-Sample Test (Appendix E).
- Assumption 3 (A_3): The two models do not have any auto-correlation, defining by Standard Runs Test (Appendix F).
- Assumption 4 (A_4): The two models do not have any multi-collinearity, tested by examining VIF values (Variance Inflation Factors) (Appendix G).

• Assumption 5 (A_5): Both Model (1) and (2) do have homoscedasticity, tested by using Spearman's RHO test between unstandardized residuals and all independent variables (Appendix H).

5. DISCUSSION AND RECOMMENDATION

5.1. Testing Hypotheses

Table 4: Results of Hypotheses Testing

No.	Factor	Research Hypotheses	Standardized Coefficients	Sig	Concluded
1	Benefits – Attitude	H_1: Benefits and Attitude positively influence Online shopping behavior	.711	.000	Accept
2	Policy barriers	H_2: Policy barriers positively influence Online shopping behavior	.133	.000	Accept
3	Disease prevention	H_3: Disease prevention positively influences Online shopping behavior	.247	.000	Accept
4	Perceived severity	H_4: Perceived severity positively influences Online shopping behavior	.136	.000	Accept
5	Information overload	H_5: Information overload positively influences Online shopping behavior	.012	.688	Reject
6	Cyberchondria	H_6: Information overload positively influences Online shopping behavior	.104	.001	Accept

Sig. value of 5 factors (Benefits – Attitude; Policy barriers; Disease prevention; Perceived severity; Cyberchondria) are lower than 1% - level of significance, so that H_1; H_2; H_3; H_4 and H_6 of the modified Research model (Figure 2) are accepted, but Sig. value of Information overload equal 0.688 more than 1% that H_5 would be rejected. As a result, it can be concluded that the COVID-19 factors including Policy barriers; Disease prevention; Perceived severity; Cyberchondria statistically positively influence Online shopping behavior, but the impact of Information overload is not statistically significant. Additionally, the Benefits – Attitude also apparently affects the Internet shopping behavior of Danang's citizens.

5.2. Discussion

The R^2 value of Model (1) is 61.4%, indicating 6 factors (Benefits – Attitude; Policy barriers; Disease prevention; Perceived severity; Cyberchondria; Information Overload) affecting Danang consumers' behavior toward online shopping. In other words, there are other determinants of Internet shopping behaviors, accounting for 38.6%. In the six factors of Model (1), there are five statistically significant factors affecting Danang

consumers' behavior toward e-shopping, in which, 4 factors represent COVID-19 as Policy barriers, Disease prevention, perceived severity, Cyberchondria. However, these 4 factors do not have a strong impact on online buying behavior, only at 10.8% (R^2) according to the model (2) from Table 3, while Benefits- Attitude factor strongly influences Danang consumers' buying behavior, accounted for 50.6% (0.614 – 0.108 = 0.506).

Correspondingly, all four COVID-19 factors affecting online purchasing behavior have positive standardized coefficients (greater than 0), implying that they are positively correlated with online shopping behavior. It means that any factor of these 4 factors increases, it will stimulate Danang consumers' online shopping behavior and otherwise. Precisely, the disease prevention factor has the strongest influence on Danang consumers' online buying behavior because of the greatest standardized coefficient (0.247) compared to other independent variables. Likewise, the studies of Rubin *et al.* (2009) and Laato *et al.* (2020) also found that people tend to work from home, avoid physical contact and especially perform constantly online activities in order to mitigate COVID infections. Following by perceived severity factor, it ranks in second place with the standardized coefficient of 0.136, revealing that people are serially aware of consequences from coronavirus and intend to be self-isolated and reinforce their immune systems to lessen the clinical vulnerability and illness, proposed by Protection Motivation Theory (Ling *et al.*, 2019; Farooq *et al.*, 2020). Therefore, shopping via e-commerce websites is promoted to assist the medical grounds to overcome severe situations.

The newly factor – Policy barriers added by the research authors is estimated as the third force (0.133 – the coefficient) to boost Internet shopping from Danang's people. In particular, guidance on shielding and medical protection from the governments and international organizations at the beginning and later on with conducting the entry restrictions and quarantine regulations escalate the online purchasing of people around the world, especially in Danang city at the start of the second COVID-19 outbreak in Vietnam as similar as the findings from Stoecklin *et al.* (2020) in France and Farooq *et al.* (2020) among social media users. Finally, the cyberchondriac behavior least affects online purchasing with the coefficient of 0.104. In fact, searching for information on unusual experiences as well as some therapeutic strategies is useful to protect themselves against SARS-CoV2 infections. Consequently, businesses enhance and concentrate more on their online platform to interact rapidly with customers and moderately recover after the global crisis (Vismara *et al.*, 2020; Farooq *et al.*, 2020).

5.3. Conclusion

5.3.1. Findings

In term of theory, the authors identified policies that the Vietnamese government and Danang local authorities have implemented during the COVID-19 pandemic. With the

results from qualitative research, the authors proposed 3 sub-questions in the Policy barriers factor. Henceforth, based on findings of the present research, the future research could refer to measure the impact of Policy barriers factor on online buying behavior of the whole country – Vietnam or other countries around the world.

The practical research result in Danang also describes that the Covid-19 factors influence the online buying behavior of locals, but the impact level is not too high, compared to economic benefits and the locals' attitude with e-shopping.

5.3.2. Limitation

Because of the time limit during Covid 19 pandemic, apart from the COVID-19 factors, only economic benefits and attitudes factors are attached in the research model. However, there are still other important factors that were not included in this research model such as perceived risks, subjective norms or facilitating conditions… leading to the results is not so comprehensive. Nonetheless, the research scope is limited in Danang city resulting that the findings may not represent Vietnamese online shopping behavior in general.

Acknowledgement

Appendix A - Reliability Testing

No	Factor	Corrected Item-Total Correlation	Cronbach's Alpha
CB1	Cyberchondria	0.539	0.676
CB2		0.557	
CB3		0.389	
IO1	Information overload	0.611	0.767
IO2		0.652	
IO3		0.539	
PS1	Perceived severity	0.575	0.791
PS2		0.707	
PS3		0.636	
DP1	Disease prevention	0.666	0.825
DP2		0.671	
DP3		0.702	
DP4		0.585	

contd.

PB1	Policy barriers	0.801	0.906
PB2		0.768	
PB3		0.809	
PB4		0.773	
B1	Perceived Economic benefits	0.674	0.786
B2		0.701	
B3		0.568	
B4		0.474	
A1	Attitude	0.731	.854
A2		0.721	
A3		0.723	
OB1	Online shopping behavior	0.579	0.870
OB2		0.710	
OB3		0.778	
OB4		0.728	
OB5		0.685	

Appendix B - Exploratory Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.856
Bartlett's Test of Sphericity	Approx. Chi-Square	4882.876
	Df	276
	Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.753	28.136	28.136	4.029	16.790	16.790
2	2.850	11.875	40.011	3.192	13.302	30.092
3	2.385	9.937	49.947	2.631	10.963	41.054
4	1.502	6.260	56.208	2.197	9.153	50.207
5	1.414	5.891	62.098	2.062	8.591	58.798
6	1.127	4.695	66.793	1.919	7.995	66.793

Rotated Component Matrix

	1 (Benefits – Attitude)	2 (Policy barriers)	3 (Disease prevention)	4 (Perceived severity)	5 (Information overload)	6 (Cyberchondria)
CB1						0.752
CB2						0.787
CB3						0.675
IO1					0.773	
IO2					0.850	
IO3					0.747	
PS1				0.722		
PS2				0.836		
PS3				0.777		
DP1			0.770			
DP2			0.772			
DP3			0.795			
DP4			0.673			
PB1		0.863				
PB2		0.859				
PB3		0.874				
PB4		0.857				
BA1	0.723					
BA2	0.750					
BA3	0.647					
BA4	0.684					
BA5	0.764					
BA6	0.709					
BA7	0.767					

Appendix C - The results of Testing Model (1) and (2)

ANOVA OF Model (1)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	262.650	6	43.775	111.721	.000[b]
	Residual	165.350	422	.392		
	Total	428.000	428			

a. Dependent Variable: Online shopping behavior

b. Predictors: (Constant), Cyberchondria, Information overload, Perceived severity, Disease prevention, Policy barriers, Benefits - Attitude

ANOVA OF Model (2)

	Model	Sum of Squares	df	Mean Square	F	Sig.
2	Regression	46.262	5	9.252	10.253	.000[b]
	Residual	381.738	423	.902		
	Total	428.000	428			

a. Dependent Variable: Online shopping behavior
b. Predictors: (Constant), Cyberchondria, Information overload, Perceived severity, Disease prevention, Policy barriers

Appendix D - One-Sample Kolmogorov-Smirnov Test

		Residual (1)	Residual (2)
N		429	429
Normal Parameters[a,b]	Mean	0E-7	0E-7
	Std. Deviation	0.62155525	.94441015
Most Extreme Differences	Absolute	0.076	.067
	Positive	0.056	.067
	Negative	-0.076	-.031
Kolmogorov-Smirnov Z		1.566	1.392
Asymp. Sig. (2-tailed)		0.015	.041

Appendix E - One Sample T-test

		Residual (1)	Residual (2)
Test Value = 0	T	0.000	.000
	Df	428	428
	Sig. (2-tailed)	1.000	1.000
	Mean Difference	0E-8	0E-8
95% Confidence	Lower	-.0589833	-.0896210
Interval of the Difference	Upper	.0589833	.0896210

Appendix F – Runs Test

	Residual (1)	Residual (2)
Test Value[a]	0E-7	0E-7
Cases < Test Value	197	211
Cases >= Test Value	232	218
Total Cases	429	429
Number of Runs	211	217
Z	-.299	.151
Asymp. Sig. (2-tailed)	.765	.880

Appendix G – Multicollinearity

Model	Collinearity Statistics (1)		Collinearity Statistics (2)	
	Tolerance	*VIF*	*Tolerance*	*VIF*
Benefits – Attitude	1.000	1.000	-	-
Policy barriers	1.000	1.000	1.000	1.000
Disease prevention	1.000	1.000	1.000	1.000
Perceived severity	1.000	1.000	1.000	1.000
Information overload	1.000	1.000	1.000	1.000
Cyberchondria	1.000	1.000	1.000	1.000

Appendix H – Spearman's RHO Test

Spearman's RHO		*Residual (1)*	*Residual (2)*
Benefits – Attitude	Correlation Coefficient	.020	-
	Sig. (2-tailed)	.683	-
Policy barriers	Correlation Coefficient	-.019	-.021
	Sig. (2-tailed)	.689	.657
Disease prevention	Correlation Coefficient	.036	-.054
	Sig. (2-tailed)	.456	.265
Perceived severity	Correlation Coefficient	-.028	-.021
	Sig. (2-tailed)	.559	.660
Information overload	Correlation Coefficient	.028	.002
	Sig. (2-tailed)	.558	.968
Cyberchondria	Correlation Coefficient	-.031	-.039
	Sig. (2-tailed)	.525	.423

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