

Survey on Public Behaviours Toward Online Shopping During COVID-19 in Negeri Sembilan

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Abstract: The spreading of the coronavirus 2019 (COVID-19) caused significant impacts to Malaysia's economy such as the decline in the gross domestic product, the value of Malaysian ringgit decreased, increasing the unemployment rate, and bankruptcies in different major industries. Small and medium-sized enterprises (SMEs) had to deal with lockdown limitations like all business premises required to close during the MCO period, which had an impact on their operations and income. Hence, e-commerce plays a vital role to help SMEs expand their business. SMEs may not understand the current public behaviours towards online shopping. Therefore, this study is conducted to identify the public behaviours towards online shopping in Negeri Sembilan during the COVID-19 pandemic. An online questionnaire form was distributed to social media using the convenience sampling method. Furthermore, this research study the factors affecting public purchase online, public satisfaction towards online shopping services, and changes in public purchasing behaviours during the COVID-19 pandemic. The methods applied in this study are the descriptive analysis, Friedman test, Spearman's correlation test, Chi-squared test, and Cramer's V analysis. The results show that the public is usually purchase once per month and prefer to purchase fashion and clothing products which paid by using bank transfer. The main factor that affects the public to purchase online is convenience. Overall, the public is satisfied with the online shopping services and there are some changes in public purchasing behaviours during the COVID-19 pandemic. There is an association between respondent's occupation and public satisfaction towards online shopping services, and between respondent's education level and changes in public purchasing behaviours. The suggestion for future researchers is to increase the sample size to more states in Malaysia to improve the completeness of the study.

Keywords: Public Behaviours, Online Shopping, E-Commerce, Friedman Test, Spearman's Correlation Test, Chi-Squared Test And Cramer's V Analysis.

1. Introduction

Several restrictions must be obeyed by Malaysian during the period of Movement of Control Order (MCO). The restrictions have limited the movement of public and small and medium-sized enterprises (SMEs). The long-term MCO period has giving a huge impact which are the global supply chain, bankruptcies, plummeting stock market as well as an increase in the unemployment rate [1]. Government undergoes a recovery economy plan in the e-commerce business for boosting and helping SMEs to increase their revenue [2]. Thus, every SME starts to design a backup plan to develop business in e-commerce. However, another problem has appeared which is the competitiveness among SMEs in e-commerce is high. Public purchasing behaviour can define as an action that involves choosing, buying, and consuming the product or services to satisfy their needs or wants [3]. There is much research studied about the types of public purchasing behaviour.

The study had categorized them into different groups according to various characteristics [4]. First is the habitual purchasing behaviour, it is an attitude in which the public only buys the product or services without any extra thinking. Around 45 % of public behaviour reported they are doing repetition almost every day [5]. They buy the product or services, either their favourite brand or the brand they usually used. The second purchasing behaviour group is known as complex purchasing behaviour. The public experiences this purchasing behaviour when they are going to buy an expensive product. In this occasional transaction, the public carries out many complex procedures before deciding to buy a product or service. Dissonance-reducing purchasing behaviour is the third group of purchasing behaviour. This purchasing behaviour occurs when the public manages to buy a product with low availability of selection and less apparent differences among brands. This situation faced by the public makes them purchase a product that can be easily found [6]. The fourth type of purchasing group is defined as variety-seeking purchasing behaviour. Public with this type of purchasing behaviour buy a product due to curiosity and variety of brands. They were often doing brand switching for the next purchase.

For the period of COVID-19, Malaysia's economy is projected to decrease by 3.1 % in 2020 [7]. The restriction set by the government has caused some economic issues local and international. For local economy businesses, even though Malaysians can cross the state for working purposes, but they still need to request apply approval letter or working pass from the employer and get approval from the police station [8]. Hence, the process of business may be delayed due to the process of applying form. While for international business, the government prohibited Malaysian go for overseas and banned other countries from entering. Thus, they are unable to export our goods and import goods from other countries. Therefore, it is important to identify public purchasing behaviours and the factor that affects the public to purchase online to boost the revenue of online shopping in Malaysia. The purpose of this study is to identify the public purchasing behaviours towards online shopping. Next, to investigate the factors that affect the public to purchase online. Thirdly, to analyse the public satisfaction toward online shopping platform services and to observe the changes in public purchasing behaviours during COVID-19.

2. Data and Methods

This part briefly explains the collected data, pilot test and the statistical methods used to analyse the data. The statistical methods include descriptive analysis, Friedman test, Spearman's correlation test, Chi-square test and Cramer's V analysis.

2.1 Data collection

The data are collected from the 384 respondents in Negeri Sembilan by using Google form. The sample size was calculated by using the formula in Eq 1, with N (population size), p (common response rate), B (common choice of margin of error) and C (Z score of 95% confidence level) [9].

$$n = \frac{[(N)(p)(1 - p)]}{\left[(N - 1) \left(\frac{B}{C} \right)^2 + (p)(1 - p) \right]} \quad Eq. 1$$

The data was collected by applying the convenience sampling method. This sampling method is used because it is the most useful method for conducting pilot survey [10]. The total of 384 respondents are consists of seven districts which are Seremban (26%), Port Dickson (24%), Kuala Pilah (17%), Jempol (9%), Jelebu (8%), Rembau (8%) and Tampin (7%). There are five sections in the questionnaire which are demographic profile (Section A), public behaviours toward online shopping (Section B), the factor that affects public to purchase online (Section C), public satisfaction towards online shopping services (Section D), and changes in public purchasing behaviours during COVID-19 (Section E).

2.2 Pilot test

The pilot test is a small preliminary study that helps the researcher implement a large survey. The target sample size for the pilot test is suggested 10% of the total population [11]. Therefore, 38 respondents are selected for filling in the questionnaire. The overall value of Cronbach's Alpha is 0.8218 which shows a good level of reliability. Hence, the questionnaire is reliable for the real survey. Cronbach's Alpha can be calculated by Eq 2, with N (number of question) and \bar{r} (mean correlation between the question) [12].

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N - 1) \cdot \bar{r}} \quad Eq. 2$$

2.3 Descriptive analysis

This analysis usually analyse univariate data such as gender and age. It depends on the numerical calculation or graphical representation to show the univariate data [13].

2.4 Friedman test

Friedman test is a non-parametric test. It means no assumptions from population distribution need to be tested before running the test. This test is used to find the differences between dependent variables which are ordinal. Moreover, the mean rankings of the Friedman test can be used to rank the factors [14]. The value of the test statistic is obtained by applying the formula shown in Eq 3 [15]. with N (sample size), and R (sum of rank per column).

$$FM = \frac{12}{Nk(k + 1)} \cdot \sum R^2 - [3N(k + 1)] \quad Eq. 3$$

2.5 Spearman's correlation test

It is a non-parametric method [16] used for identifying the degree of association between the ordinal data. The formula is shown in Eq 4 with ρ (value of Spearman's correlation), d_i (difference between the ranks of corresponding variables), and n (number of observations).

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} \quad Eq. 4$$

The value of correlation represents a different type of correlation shown in Table 1. There is no correlation when Spearman's correlation value is less than ± 0.30 [17].

Table 1: Strength of correlation based on Spearman’s correlation value

Spearman’s correlation value	Type of correlation
0 to ±0.30	Negligible correlation
±0.30 to ±0.50	Low positive or negative correlation
±0.50 to ±0.70	Moderate positive or negative correlation
±0.70 to ±0.90	High positive or negative correlation
±0.90 to ±1.00	Very high positive or negative correlation

2.6 Chi-squared test and Cramer’s V analysis

Chi-square analysis is normally used for determining the relationship between categorical variables [18]. Eq 5 is the formula used to test the Chi-square statistics which involved O_i (observed value) and E_i (expected value).

$$X_c^2 = \sum \frac{(O_i - E_i)^2}{E_i} \quad Eq. 5$$

Cramer’s V analysis is known as the post-test once the result from the Chi-square test is significant. This analysis can be used to further estimate the strength of the association between the categorical variables [19]. The formula is stated in Eq 6 with the n (sample size) and k (number of rows or columns, whichever is smaller)

$$V = \sqrt{\frac{X_c^2}{n(k - 1)}} \quad Eq. 6$$

Table 2 shows the different strengths of association with different ranges of Cramer’s V value. Once the value of Cramer’s V value is less than 0.20 is considered as the weak association between the variables. It is a strong association between the variables when Cramer’s V value is more than 0.60 [20].

Table 2: Strength of association based on Cramer’s V value

Cramer’s V value	Strength of association
0.00-0.10	No
0.10-0.20	Weak
0.20-0.40	Moderate
0.40-0.60	Relatively strong
0.60-0.80	Strong
0.80-1.00	Very strong

3. Results and Discussion

This part discusses the analysis of the data. There are seven sections in this part which are the result of public purchasing behaviours towards online shopping, ranking factors that affect public to purchase online, public satisfaction towards online shopping services, Chi-squared test and Cramer’s V analysis for section D and section E, the result of Spearman’s correlation test and changes in public purchasing behaviours during COVID-19.

3.1 Result of Public Purchasing Behaviours towards Online Shopping

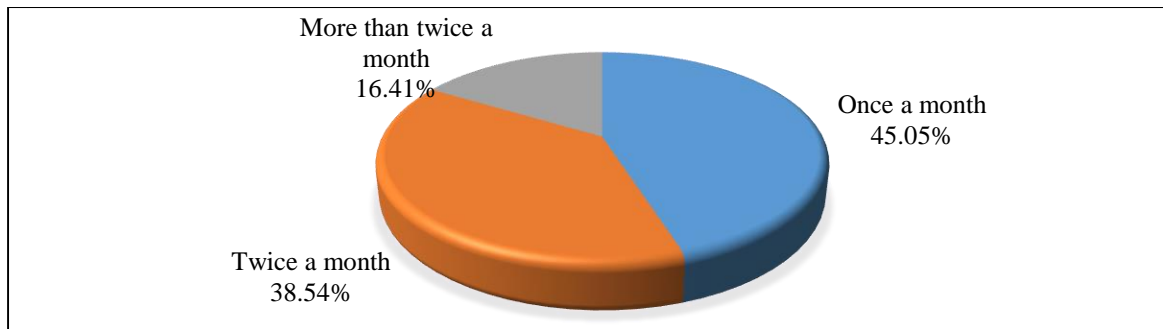


Figure 1: Frequency of purchasing online

Figure 1 indicates the frequency of public purchases online in a month. 173 (45%) respondents normally purchase once a month. While other 148 (39%) respondents usually purchase online twice per month. The remaining 63 (16%) respondents had purchased online more than twice per month.

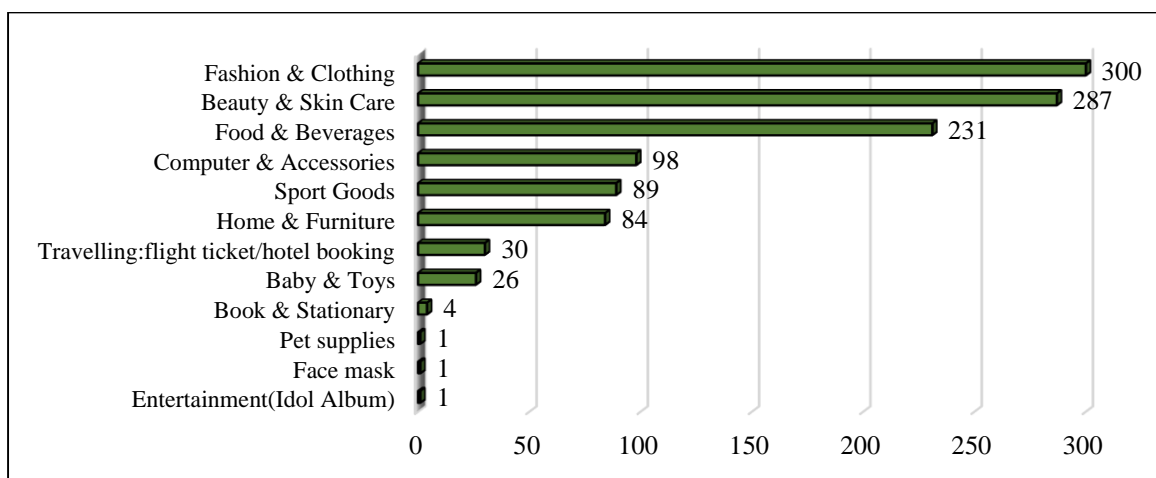


Figure 2: Products or services most purchased by the public.

Figure 2 illustrates the most type of products or services that the public purchase online. The top three types of products or services are fashion and clothing (300 times, 26%) followed by beauty and skin care (287 times, 25%) and food and beverages (241 times, 20%).

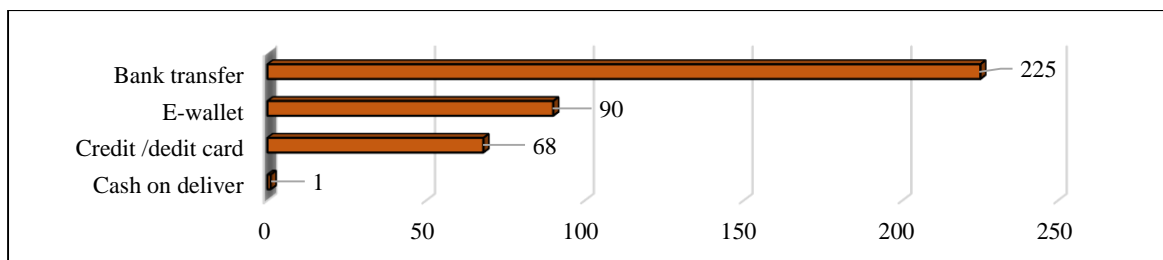


Figure 3: Type of online payment method

Figure 3 shows the frequency of three types of online payment methods used by the respondents. More than half of respondents, 225 (59%) paid their purchase online by using bank transfer. The second-highest number of respondents is 90 (23%) paid using e-wallet whereas 68 respondents (18%) paid using credit or debit cards. Only one (0.3%) respondent paid by cash on delivery to pay the online purchase.

3.2 Ranking Factors that Affect Public to Purchase Online

The null and alternative hypothesis testing for the Friedman test is as below:

H_0 : Ranking of factors has no significant effect on the public to purchase online.

H_1 : Ranking of factors has a significant effect on the public to purchase online.

Table 3: Result of Friedman test

Factors affect public to purchase online	<i>p</i> -value
F1 (Convenience to purchase)	
F2 (Variety of products and brands)	
F3 (Quality of the product and service)	
F6 (Global shopping festival (Example: Double 11 festival or other festivals))	
F4 (Influence of friends and family members)	0.000
F7 (Shipping cost or discount voucher are offered)	
F5 (Product or service advertisements posted on social media)	
F8 (Customer's rating and review towards the online seller)	
F9 (Design of the online shopping website)	

Table 3 shows the asymptotic value which is the *p*-value is less than 0.05 and there is sufficient evidence to reject the null hypothesis which is ranking of factors has no significant effect on the public to purchase online. Hence, it can be concluded that the ranking of factors has a significant effect on the public to purchase online.

3.3 Public satisfaction towards online shopping services

Table 4 shows the results on the satisfaction level of 384 respondents towards online shopping services. The result is shown in form of frequency and percentage.

Table 4: Public satisfaction towards online shopping services

No	Statement	Frequency & Percentage				
		Strongly dissatisfied	Dissatisfied	Neutral	Satisfied	Strongly Satisfied
1	Price of online product	0 (0%)	1 (0.26%)	44 (11.46%)	315 (82.03%)	24 (6.25%)
2	Quality of the service provided	0 (0%)	5 (1.30%)	57 (14.84%)	297 (77.34%)	25 (6.51%)
3	Variety of product or services sold	0 (0%)	4 (1.04%)	41 (10.68%)	277 (72.14%)	62 (16.15%)
4	Information of product or services provided	0 (0%)	19 (4.95%)	61 (15.89%)	257 (66.93%)	47 (12.24%)
5	Security of payment	0 (0%)	5 (1.30%)	50 (13.02%)	90 (23.44%)	239 (62.24%)
6	Response rate of the online seller	2 (0.52%)	28 (7.29%)	132 (34.38%)	191 (49.74%)	31 (8.07%)
7	Shipping fee or discount voucher provided	0 (0%)	13 (3.39%)	51 (13.28%)	272 (70.83%)	48 (12.50%)
8	Estimation of the time arrival	0 (0%)	21 (5.46%)	42 (10.94%)	293 (76.30%)	28 (7.29%)

9	Service of courier service	1 (0.26%)	10 (2.60%)	47 (12.24%)	284 (73.96%)	42 (10.94%)
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Table 4 displays the results on the factors that affect the public to purchase online. 82% of respondents are satisfied with the price provided by the online seller. The quality of the service offered by online buyers is satisfied by 297 (77%) respondents. 277 respondents (72%) were satisfied with the variety of products or services sold. 67% of respondents were satisfied with the information of products or services provided. Furthermore, 239 (62%) respondents are satisfied with the security of payment. Next, 191(50%) of respondents are satisfied with the response rate of online buyers. More than half of respondents which is 272 (71%) are satisfied with the shipping fee and voucher provided by the online shopping platform. Meanwhile, 293 (76%) respondents are satisfied with the estimation of online product time arrival. Lastly, 284 (74%) of respondents are satisfied with the service provided by the courier service. According to the result, it can be assumed that most of the respondents have a good experience with their online shopping services.

3.4 The Chi-squared test and Cramer's V analysis for section D

The Chi-squared test and Cramer's V method were used to identify the association and the strength between the demographic profile with the public satisfaction (Section D). The hypotheses on Chi-squared test and Cramer's V analysis are stated below:

H_0 : There is no association between occupation and public satisfaction towards online shopping services.

H_1 : There is an association between occupation and public satisfaction towards online shopping services.

Table 5: Analysis of Chi-squared test and Cramer's V analysis for section D

No	Statements	<i>p</i> -value	Cramer's V
1	Price of online product (PS 1)	0.000	0.196
2	Quality of the service provided (PS 2)	0.000	0.197
3	Variety of products or services sold (PS 3)	0.000	0.211
4	Information of product or services provided (PS 4)	0.004	0.158
5	Security of payment (PS 5)	0.000	0.183
6	The response rate of the online seller (PS 6)	0.001	0.162
7	Shipping fee or discount voucher provided (PS 7)	0.000	0.198
8	Estimation of the time arrival (PS 8)	0.000	0.194
9	Service of courier service (PS 9)	0.000	0.201

Table 5 shows the result of the Chi-squared test and Cramer's V analysis for respondents' occupation towards public satisfaction. The *p*-value of the nine statements is less than the 5% significance level. It means the null hypothesis is rejected. Hence, there is an association between respondents' occupation and public satisfaction. Based on the Cramer's V results, the range is between 0.158 and 0.211 for the nine statements. Cramer's V lies between 0.10 to 0.20 is indicating there is a weak association between the variables. It can be concluded that statements PS4, PS5, PS6 and PS8 have a weak association with the respondent's occupation. Meanwhile, the remaining statements PS1, PS2, PS3, PS7, and PS9 have a moderate association with the respondent's occupation because the Cramer's V for these five statements is in the range of 0.20 to 0.40. There is an association between

occupation and public satisfaction towards online shopping. This can be assumed that respondents with different occupations may care about the different types of needs and wants. According to the strength of association, it can be said that the respondent with the different occupations is more emphasis on the variety of the products or services, followed by customer service, shipping fee or voucher provided, quality of services provided and price of products or services.

3.5 Result of Spearman's correlation test

This section is investigating about the correlation between the statements in public satisfaction. The hypotheses are developed as below:

H_0 : There is no correlation between nine aspects of online shopping services towards public satisfaction.

H_1 : There is a correlation between nine aspects of online shopping services towards public satisfaction.

Table 6: Analysis of Spearman's correlation

	PS1	PS2	PS3	PS4	PS5	PS6	PS7	PS8	PS9
PS1	1	0.412	0.305	0.333	0.303	0.214	0.329	0.382	0.256
PS2	0.412	1	0.22	0.426	0.352	0.282	0.252	0.331	0.416
PS3	0.305	0.22	1	0.274	0.092	0.121	0.303	0.179	0.198
PS4	0.333	0.426	0.274	1	0.341	0.312	0.298	0.355	0.402
PS5	0.303	0.352	0.092	0.341	1	0.112	0.238	0.325	0.365
PS6	0.214	0.282	0.121	0.312	0.112	1	0.271	0.22	0.314
PS7	0.329	0.252	0.303	0.298	0.238	0.271	1	0.37	0.349
PS8	0.382	0.331	0.179	0.355	0.325	0.22	0.37	1	0.548
PS9	0.256	0.416	0.198	0.402	0.365	0.314	0.349	0.548	1

Table 6 shows the result of the correlation between the level of satisfaction towards online shopping services. The results of the Spearman correlation show there is a positive correlation between nine aspects of online shopping services towards public satisfaction. There are different types of correlation between the variables. There is a positive low correlation between the variables which are the correlation between (PS1 and PS2, PS1 and PS3, PS1 and PS4, PS1 and PS7, PS1 and PS8, PS2 and PS4, PS2 and PS5, PS2 and PS8, PS2 and PS9, PS4 and PS5, PS4 and PS5, PS4 and PS7, PS4 and PS8, PS4 and PS9, PS5 and PS8, PS5 and PS9, PS6 and PS9, PS7 and PS8, PS7 and PS9). On the other hand, there is a positive moderate correlation between PS8 and PS9. The only positive moderate correlation between PS8 and PS9 may be due to respondents' tendency to know the status of their purchased item or services after completing the online payment.

3.6 Changes in public purchasing behaviours during COVID-19

Table 7 shows the level of satisfaction of 384 respondents towards online shopping services. The result is shown in form of frequency and percentage.

Table 7: The changes in public purchasing behaviours during COVID-19

No	Statements	Frequency & Percentage		
		Yes	Unchanged	No
1	Time consuming on social media increase during COVID-19.	361 (94.01%)	18 (4.69%)	5 (1.30%)
2	The frequency of purchasing online increase during COVID-19.	356 (92.71%)	21 (5.46%)	7 (1.82%)
3	The frequency of shopping at physical stores increases during COVID-19.	16 (4.17%)	10 (2.60%)	358 (93.23%)

4	The frequency of purchasing hygiene products online increase during COVID-19	333 (86.72%)	24 (6.25%)	27 (7.03%)
5	The frequency of purchasing health supplements increase during COVID-19.	235 (61.20%)	27 (7.03%)	122 (31.77%)
6	The frequency of using a voucher given in an online shopping platform increase during COVID-19.	355 (92.45%)	20 (5.21%)	9 (2.34%)

Table 7 displays the public responses towards the changes in online purchasing behaviours during the COVID-19 pandemic. It is shown that there are many changes. Most of the respondents (94%) spent their time on social media increased during this COVID-19 pandemic. There are 356 (93%) respondents who were answered “yes” for their frequency of purchasing online are increased in the period of COVID-19. More than half of the respondents (87%) actively purchase hygiene products such as soaps, toilet paper, and hand sanitisers online during this crisis period. Moreover, 235 (61%) respondents are increasing their frequency of buying health supplements like vitamin C, iron, and calcium. There are 92% of respondents frequently apply vouchers for online payment during the COVID-19 pandemic.

3.7 The Chi-square test and Cramer’s V analysis for section E

This section explores the strength of association between the respondent’s education with the changes of public purchasing behaviour toward online shopping during COVID-19 (Section E). The hypotheses are formed as stated below:

H_0 : There is no association between the respondents’ education and the changes in public purchasing behaviours toward online shopping during the COVID-19 pandemic.

H_1 : There is an association between the respondents’ education and changes in public purchasing behaviours toward online shopping during the COVID-19 pandemic.

Table 8: Result of Chi-square test and Cramer’s V analysis for section E

No.	Statements	<i>p</i> -value	Cramer’s V
1	The frequency of shopping at physical stores increases during COVID-19. (C3)	0.000	0.198
2	The frequency of purchasing hygiene products online increase during COVID-19. (C4)	0.000	0.195
3	The frequency of purchasing health supplements increases during COVID-19. (C5)	0.037	0.146
4	The frequency of using a voucher given in online shopping platforms increase during COVID-19. (C6)	0.029	0.149

Table 8 shows the result of the Chi-squared test and Cramer’s V analysis. The *p*-value for four statements is less than the 5% significance level. Hence, the null hypothesis is rejected. Therefore, there is an association between respondents’ education and changes in public purchasing behaviours during the COVID-19 pandemic. The association strength for statements C5 and C6 are 0.146 and 0.149 respectively. Both Cramer’s V values are in the range of 0.10 to 0.20. Hence, there is a weak association between the respondent’s education with statements C5 and C6. While there is a moderate association between the respondent’s education and statement C3 and C4 as the Cramer’s V of both statements are in the range of 0.20 to 0.40. There is an association between the education level with changes in

purchasing behaviour during the COVID-19 pandemic maybe because their level of awareness towards the COVID-19 is increasing. Based on the strengths of association, it can be concluded that the different level of education has more affected the frequency of visiting a physical store and purchasing hygiene product.

4. Conclusion

The public in Negeri Sembilan usually purchases online once a month. The most popular online product often purchased by the public is fashion and clothing and they like to use bank transfers to settle their online payment. Factor The convenience to purchase is the most influencing factor affecting the public in Negeri Sembilan purchase online during this COVID-19 pandemic. The public in Negeri Sembilan is having a good experience and is satisfied with online shopping especially the security of payment. There are changes in public purchasing behaviours during the period of COVID-19 which included the increase in the frequency of doing online shopping, purchasing hygiene products and health supplements as well as applying vouchers when completing the online payment in an online shopping platform. There is a correlation between nine aspects of online shopping services towards public satisfaction. Meanwhile, there is an association between the respondent's demographic which is the respondent's occupation and respondent's education level occurred with public satisfaction and changes in public purchasing behaviours during the COVID-19 pandemic respectively. In a nutshell, some improvements that can be done by the future researchers from this study which is open-ended questions can be added to analyse more details about online shopping for exploring more information. Next is the target respondent can be focused only on generation Z or who experienced online shopping beyond two years to have a better understanding of online shopping. Increasing the sample size to more states in Malaysia strengthens the completeness of the research.

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