

ORIGINAL ARTICLE

Awareness and Preparedness of Fomite Transmission Among Malaysian Online Shoppers: A Cross-Sectional Survey

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ABSTRACT

Introduction: COVID-19 outbreak is the greatest communicable disease that hit globally, caused by SARS-CoV-2 virus. Malaysia commenced a Movement Control Order (MCO) to contain the epidemic, and thereby altered consumer's purchasing pattern drastically into online shopping, thus increase the demand of delivery services. The virus able to survive on surfaces up until 9 days depending on the type of surface. Nonetheless, the negligence of proper hygiene management among the vendor, the courier or the user can trigger fomite transmission. The aims of this study were to determine the level of awareness and readiness of fomite transmission caused by COVID-19 among Malaysian online shoppers by evaluating knowledge, precautionary measurements and psychological state.

Methods: Convenience sampling method was used for data collection, and 416 respondents participated. The survey instrument comprised of 2 parts; socio-demographic characteristics and the second part consist of COVID-19 transmission as well as its survivability, precautions and psychological state during the outbreak. This was transferred to a Google form and the link was shared through social medias. Data were analysed using SPSS software v.23.0.

Results: In spite of the fact that 88% of respondents worried about being infected with COVID-19 and well informed regarding fomite transmission, almost half of respondents (42.3%) did not sanitize their parcels received from outside. **Conclusion:** In light of this, health authorities should implement more campaigns to emphasize the utmost importance of disinfection of any foreign items by consumers and it is strongly believed that it will provide enhanced protection against fomite transmission.

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INTRODUCTION

Outbreak of COVID-19 caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), undeniably has led to significant impact towards various anthropogenic activities. The symptoms of the COVID-19 infection include fever, cough, dyspnea, weakness and fatigue, headache and diarrhea (1). During the peak of outbreak, sporadic cases had become a major concern (2). The exact cause remains unknown. The fact that SARS-CoV-2 able to survive on surfaces up until 9 days, depends on the type of surface should not be neglected. Despite low possibility of people getting infected from touching contaminated surfaces, nonetheless, the risk

still exists, and there have been few cases of infection reported attributed to fomite transmission (3,4).

The COVID-19 crisis has directed people in many countries to significantly limit physical interactions. The restriction movement order imposed by the government and self-isolation at home became game changers in current consumer's way of life. In fact, according to a global survey conducted by Standard Chartered, there is a marked increase of online shopping and the use of cashless payment method (5). This has also led to the increase demand of delivery services, delivering the purchased items from vendor to the consumer. In addition, according to a survey by Rakuten Insight in Malaysia, an astonishing number of consumers are using online food delivery apps way more often than they did before the COVID-19 (6). As aforementioned, fomite transmission of COVID-19 is rare. Nonetheless, the negligence of proper hygiene management among the vendor, the courier or the user can trigger a chain

of infection. It is imperative to note that the courier can reach up to several users and vendors in one day. Although this mode of transmission is rare, with the increase demands on delivery services, the chances of it being the underlying cause of these sporadic cases should not be underestimated. Until now, there is no specific treatment for COVID-19. Hand sanitizer and face masks have been widely used by public as precautionary steps in handling COVID-19 infection (7,8). Nonetheless, sanitizing any foreign items by consumers should be practiced. Ultimately, it can be become a healthy habit and in fact it is strongly believed that it will enhanced protection against fomite transmission. This study aims to determine the level of awareness and readiness among Malaysian online shoppers with respect to fomite transmission caused by COVID-19 by evaluating knowledge, precautionary measurements and psychological state.

MATERIALS AND METHODS

Study design and data collection

A cross-sectional survey was conducted in Malaysia between March and July 2022. The target population of this study was Malaysians aged 18 and above who shop using online platforms in Malaysia. Participants aged below 18 and not using online platforms to purchase were excluded in this study. A web-based survey questionnaire was distributed over a five-month period using social media such as Facebook, Line, and WhatsApp. The sample size was calculated using Yamane’s formula. Below is the formula to calculate the sample size.

$$n = \frac{N}{1 + N(e)^2} \quad (\text{Eq. 1})$$

Based on Eq (1), the total population (N) is 16,600,000 and the level of precision or sampling of error (e) is 0.05. Therefore, a 350 sample size is needed in this study. The respondents were sampled through convenience sampling technique where respondents respond to the survey based on ease of accessibility. There were 416 respondents that returned the questionnaire via the online survey. Due to invalid responses, 27 respondents were disqualified, leaving 389 respondents (a response rate of 10.38%) for empirical analysis.

The survey was created by adapting the questions from a number of other surveys (9-11). The factors of knowledge that are suggested in this study are knowledge about COVID-19 transmission, survival of COVID-19, measures of precautions, and psychological impacts related to the outbreak. 20 items served as the basis for the survey. The questionnaire was divided into two sections: socio-demographic of the respondents and respondents’ knowledge towards COVID-19. A nominal scale of three points (yes, no, and not sure) was employed.

Statistical analysis

In this study, the data were analysed using the Statistical Package for Social Sciences (SPSS) v.23.0. All the categorical variables were presented as frequencies and percentages while the Mean ± Standard Deviation (SD) was used for all the continuous variables. To compare the mean differences in KAP scores, an Independent sample T-test, and One Way ANOVA was used and tested using the statistical significance level set at P-value < 0.05.

Ethics approval

All aspects and protocols of this study were reviewed and approved by the Research Ethics Committee of Universiti Teknologi MARA (UiTM) (REC/12/2021).

RESULTS

Descriptive data of the study population

Table I summarizes the results of internal reliability, which has been assessed by estimating Cronbach’s alpha. In this study, the Cronbach’s alpha is set at 0.60 as suggests by Nunnally (1978) (12) and commonly practice in the existing studies (13,14). Thus, all the indicators remain in the measurement model except the precautionary measurements since Cronbach’s alpha is less than 0.60.

Table I: The Cronbach alpha for KAP scores of the respondents

Constructs	Number of items	Cronbach Alpha
Knowledge about COVID-19 transmission	5	0.863
Knowledge about COVID-19 survival	5	0.933
Precautionary Measurements	6	0.370
Psychological state regarding the pandemic	5	0.617

A total of 416 participants completed the questionnaire. Overall, 257 of the participants were female (61.8%). The majority of participants were from the age group of 35-44 years old (n=196; 47.11%) and most of the participants reside in Selangor (n=157; 37.7%). In terms of race, 94% (n=391) of the participants were Malay, followed by Chinese (n=13; 3.1%) and Indians (n=8; 1.9%). Furthermore, Table II shows that relatively 44.7% (n=188) of the respondents did online purchasing 1-2 times in a month with almost half of the participants sanitized their parcel (51.7% ; 215/416).

Assessment of knowledge

A total of ten items were used to appraise knowledge on COVID-19 transmission and survivability. Most respondents answered correctly with a mean of 4.3870 ± 0.66647. Respondents appeared to be aware that COVID-19 can be spread via droplets during coughing or sneezing (n=398; 95%), by fomite transmission as well

Table II: Demographic characteristics of participants

Sociodemographic characteristics	Total (n = 416)	
	n	%
Gender		
Male	159	38.2
Female	257	61.8
Age		
18-24	37	8.89
25-34	98	23.56
35-44	196	47.11
45-54	60	14.42
>55	25	6.01
Race		
Malay	391	94
Chinese	13	3.1
India	8	1.9
Others	3	0.7
State		
Selangor	157	37.7
Wilayah Persekutuan Kuala Lumpur	25	6
Wilayah Persekutuan Putrajaya	3	0.7
Negeri Sembilan	8	1.9
Melaka	41	9.9
Johor	44	10.6
Perak	11	2.6
Pulau Pinang	34	8.2
Kedah	11	2.6
Perlis	11	2.6
Kelantan	17	4.1
Pahang	20	4.8
Terengganu	14	3.4
Sabah	8	1.9
Sarawak	12	2.9
Frequency of online purchase in a month		
1-2 times	188	44.7
3-5 times	119	28.6
More than 5 times	111	26.7
Parcel sanitization		
Yes	215	51.7
No	152	36.5
Maybe	49	11.8

as through close contact with infected person. Other than that, 78% of the respondents agreed COVID-19 might transmit by hand shaking (Table III).

About 66.8 % of the participants knew that COVID-19

Table III: Responses to knowledge regarding COVID-19 transmission and survivability

Description	Correct answer	Wrong answer	Not sure
	n (%)		
Knowledge about COVID-19 transmission			
Through droplets during coughing or sneezing	398 (95.2%)	5 (1.2%)	13 (3.1%)
By touching of surfaces and devices contaminated by the virus	324 (77.9%)	19 (4.6%)	47 (11.3%)
Via close contact with infected persons	351 (84.4%)	12 (2.9%)	27 (6.5%)
Transmit by hand shaking	325 (78.1%)	22 (5.3%)	43 (10.3%)
Someone infected can transmit the virus even if they are not showing any symptoms	327 (78.6%)	16 (3.8%)	47 (11.3%)
Knowledge about COVID-19 survival			
The virus can remain viable for up to 72 hours on a plastic and stainless-steel surfaces	278 (66.8%)	41 (9.8%)	97 (23.3%)
The virus can remain viable for up to 4 hours on copper surfaces	219 (52.6%)	29 (7.0%)	142 (34.1%)
The virus can remain viable for up to 24 hours on cardboard surfaces	205 (49.3%)	43 (10.3%)	142 (34.1%)
The virus can remain viable for up to 5 days on glass surfaces	163 (39.2%)	72 (17.3%)	155 (37.2%)
The virus can remain viable up to 5 days on paper surfaces	159 (38.2%)	76 (18.3%)	155 (37.2%)

virus can persist viable up to 72 hours on a plastic and stainless-steel surface (278/416) while 52.6 % (219/416) answered correctly when asked whether the virus can remain viable for up to 4 hours on copper surfaces. Meanwhile, 49.3 % (205/461) of participants agreed the virus can be viable around 24 hours on cardboard surfaces. Nevertheless, fewer participants answered accurately when asked if COVID-19 virus can remain viable for up to 5 days on glass (n=163; 39.2%) and paper surfaces (n=59; 38.2%), respectively (Table III).

Practices concerning COVID-19

Five questions were asked regarding practices towards the pandemic. When enquired concerning hand hygiene, a large percentage of participants frequently washed their hands with soap and water for at least 20 seconds (81.5% ; 339/416), and 93.3% of participants (388/416) used disinfectants whenever soap or water is not available. Almost all of participants reported wearing a face mask in public (99% ; 412/416). The results also show that 94% of participants (391/416) practiced physical distancing whenever in public. It was found that only 46.6 % of participants (194/416) disinfected the surfaces of parcel or any items received from others (Table IV).

Psychological impact

Table V shows 88% (366/416) and 92.8% (386/416) of the respondents worried being infected, and worried

Table IV: Responses to protective measures for COVID-19

Precautionary measurements	Yes	No	Not sure
	n (%)		
Frequently wash hands with soap and water for at least 20 seconds	339 (81.5%)	47 (11.3%)	30 (7.2%)
Using disinfectants to clean hands when soap and water were not available	388 (93.3%)	23 (5.5%)	5 (1.2%)
Wear a mask in public	412 (99%)	3 (0.7%)	1 (0.2%)
Ensure physical distancing in public	391 (94%)	16 (3.8%)	9 (2.2%)
Disinfect surfaces of parcel or any items that received from others	194 (46.6%)	176 (42.3%)	46 (11.1%)

Table V: Psychological distress among the study participants in regard to COVID-19

Psychological state regarding the pandemic	Yes	No	Not sure
	n (%)		
Worried about being infected with coronavirus	366 (88%)	30 (7.2%)	20 (4.8%)
Worried about relatives and friends being infected with coronavirus	386 (92.8%)	21 (5%)	9 (2.2%)
Anxious about the pandemic	345 (82.9%)	34 (8.2%)	37 (8.9%)
Daily mood affected by the pandemic	154 (37%)	203 (48.8%)	59 (14.2%)
Paying close attention to news related to the pandemic	274 (65.9%)	81 (19.5%)	61 (14.7%)

about their families and friends being infected with coronavirus, respectively. Whilst 83% of respondents felt anxious (n= 345/416) and 66% reported to have always follow the updates about the pandemic (n= 274/416). Nevertheless, only 49% (n=203/416) of the participants felt that the pandemic did not influence their daily mood.

DISCUSSION

When COVID-19 forced much of the world into prolonged lockdown started in early 2020, online-based shopping has boomed. Consumer purchasing landscape has been shifted rapidly to online shopping as they worried to make normal purchase transaction. In April 2020, Walmart reported a remarkable increase in online sales (15). According to a survey made by Rakuten Insight in Malaysia, relatively 58% of the participants used online delivery apps (6). With the increase demands on delivery services and poor hygiene practices among vendors as well as consumers, fomite transmission might contribute to COVID-19 transmissibility. Although fomite transmission is not considered as the main route of COVID-19 infection, studies have revealed that the virus remains longer especially on smooth hard surfaces (16,17) and this fact should not be disregarded.

This study investigated the level of awareness and readiness among Malaysian online shoppers regarding fomite transmission caused by COVID-19. Our findings

indicate that almost half of the participants at least have shopped online one or two time/s in a month. Moreover, 51.7 percent of the participants did sanitize their parcel as a routine and for their own protection. Up to now, sanitization has played a pivotal role in controlling the spread of COVID-19 by decontaminate any surfaces. For instance, Kampf et al. (2020) (3) highlighted sanitization as an effective intervention strategy to intercept virus transmission and thus prevent further spread in this outbreak situation.

We have shown that the participants have satisfactory knowledge regarding COVID-19 transmission via coughing or sneezing, by touching surfaces contaminated with the virus or close contact with infected patients. The majority knew the virus could be transmitted by hand shaking or by infected patients who are not showing any symptoms. This outcome suggests that dissemination of information regarding COVID-19 transmission was effectively delivered through consistent disease prevention campaigns and awareness programs by government and private sectors to curb the spread of COVID-19. Similarly, overall knowledge of the participants in term of COVID-19 survivability on plastic, stainless steel, copper and cardboard surfaces was excellent. However, only 39.2 percent and 38.2 percent of the participants aware the virus can survive up to five days on glass and paper surfaces, respectively. This could be attributable to the fact that fomite transmission is consider as insignificant virus transmission route.

In this current study, most of the participants reported taking personal precautionary steps such as practising proper hand hygiene either using soap or disinfectants from time to time, using face mask and ensure physical distancing whenever in public. These results are parallel with their good knowledge of COVID-19 transmission. Despite being more knowledgeable about the disease transmission, it was found that less than half of the participants sanitized surfaces of parcel or items received from others. Not having adequate knowledge on virus persistence on different surfaces and poor hygienic practices might be factors contribute to this outcome.

The COVID-19 is creating panic worldwide and has negative impact in various psychological crisis during the lockdown (18,19). Majority of the participants felt worried for themselves and acquaintances about being infected with the virus. As most of the respondents were women, it might be a factor that can contribute to this elevated distress level. Besides, women are more vulnerable to emotional stress compared to men, thus more likely to be badly affected psychologically during pandemic (20, 21). In term of fomite transmission, a report by Kee et al. (2021)(22) revealed 20 % of customers using services from Pos Malaysia felt worried if the parcel received had been sanitized. As result suggested, most respondents in this study being alert

to news related to the pandemic. Additionally, it was determined that the pandemic altered emotions but not daily mood of the participants. Our study has limitation due to online format of the questionnaire and it was carried out during lockdown. This study was conducted via a convenience sample and distributed through online platform. The questionnaire might not reach to the general population and may lead to selection bias. As there is no specific therapy against COVID-19, early containment and effective prevention are pivotal to stop from further spread. Despite being proclaimed “contactless transaction”, online shopping can be a different route of transmission if the fomite transmission is not handled appropriately.

CONCLUSION

This study provides a current level of knowledge COVID-19 transmission and survivability, precautionary measures and psychological impact on the pandemic. The participants have a good knowledge of COVID-19 transmission and precautionary measures but lesser on the virus survivability on certain surfaces. The results also revealed that most of the participants experienced psychological distress due the outbreak. With regard to fomite transmission control, the importance of good hygienic practices should be highlighted especially sanitizing foreign items. Additionally, World Health Organization (WHO) (2020) prepared a guideline to prevent potential COVID-19 transmission in food businesses including for delivery workers. Implementation of health education programs by the government and health might help consumers enhance knowledge and improve practices.

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