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Lifestyle and preventive behaviors among adults during the early phase of the COVID-19 movement control order (MCO) in Malaysia

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Abstract:

BACKGROUND: Enforcement of the movement control order (MCO) in Malaysia caused by COVID-19 impacted people's health, social, behaviors, and economic consequences. Thus, this study aims to identify adults' lifestyle and preventive behaviors during the MCO's early phase.

MATERIALS AND METHODS: This study was conducted in April 2020 using a convenience sampling technique. A total of 9987 adults aged 18 years and above from all over Malaysia participated in the study. The questionnaire was distributed through online platforms, such as Facebook, Telegram, WhatsApp, and the official website. Descriptive statistics and Chi-square test were used to describe the categorical data and the independent *T*-test and one-way ANOVA tests were performed to compare continuous variables between two or more groups. The level of statistical significance was set at $P < .05$.

RESULTS: Selangor showed the highest participation (28.4%) and most of the respondents were females (68.2%), married (67.8%), and aged between 36 and 45 years old (34.1%). This study found that 10.3% were smokers, and 46.7% of the smokers intended to quit smoking. Most respondents took their three main meals daily (72.4%), but not even half completed daily food groups (45.1%). The frequent activities were internet surfing (18.8%) and house chores (18.2%). Almost 98% of the respondents agreed to implement preventive behaviors. This study also revealed that attitudes toward preventive behaviors significantly differed across genders, age groups, categories of marital status, and monthly income categories ($P < .05$). Furthermore, regarding readiness for behavior change after MCO end, only gender shows a significance difference ($P < .05$).

CONCLUSION: This study shed light on understanding public behavior during the early phase of the pandemic that may significantly impact public health in designing relevant regulations and policies to reduce the spread of COVID-19 infections and preparing strategies for future outbreaks or pandemics. As COVID-19 evolves, continuous efforts to promote positive behavioral changes in lifestyle and preventive behavior are needed to ensure the public practices a healthy lifestyle and complies with pandemic preventive measures.

Keywords:

Behavior, COVID-19, lifestyle, movement control order (MCO), preventive

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Introduction

COVID-19 was declared as a global pandemic by the World Health Organization (WHO) in March 2020.[1] The first case of COVID-19 was detected in Malaysia on January 25, 2020, and the patient traveled from China to Malaysia via Singapore.[2] In March 2020, the reported cases soared with the emergence of localized clusters. The largest cluster during that time

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was the Tabligh cluster. It was named after the religious Tabligh gathering held from February 27 to March 2 at Sri Petaling, Kuala Lumpur,[3] which led to a drastic increase in local cases. Within a few weeks, Malaysia had recorded the largest cumulative number of confirmed COVID-19 infections in Southeast Asia.[4]

Due to fast-growing cases, WHO had developed the strategic preparedness and response plan as a guideline to all countries to implement to slow down the transmission of COVID-19 while reducing the mortality.[5] The Malaysian government enforced movement control order (MCO) nationwide from March 18–31, 2020, under the Prevention and Control of Infectious Diseases Act 1988 and the Police Act 1967. MCO encompassed several aspects: (a) complete restriction on traveling movement and social gatherings nationwide; (b) closure of the national border to all Malaysians wishing to travel abroad as well as to all foreign visitors from entering Malaysia; (c) closure of all kindergartens, public and private schools, and public and private institutions of higher learning; and (d) closure of all government and private premises except for those involved in essential services. This drastic restriction of public movements took effect immediately to prevent the spread of COVID-19.[6] Also, the Malaysian Ministry of Health Malaysia (MOH) advised the individual, the family, and the community to adopt a healthy lifestyle at home.[7] Given that people would need to comply with MCO, for better or for worse, their lifestyle behaviors would change.[8,9]

As MCO urged people to stay at home due, unhealthy behaviors such as tobacco use, poor eating behavior, lack of physical activity, and increased screen time are among the behaviors that are expected to occur during lockdown.[9] A review on the management of COVID-19 has emphasized the role of maintaining a healthy diet[10] and engaging in physical exercise at home.[11] People should not disregard their healthy lifestyle because it could help them cope with COVID-19-related stress[11] and it can reduce all-cause mortality and improve well-being.[12] However, Chen *et al*.[13] stated that lifestyle behavior during lockdown remains an under-research area.

Besides, individual is also responsible for preventing the spread of COVID-19 by practicing the recommended preventive behavior which refers to how the respondent practices behavior to avoid becoming infected with the disease.[14] In the context of COVID-19, preventive behavior comprised information on perceived effectiveness and actual acceptance of preventive behavior (to protect oneself and others), to prevent both contracting COVID-19 and onward transmission, and it composed under three groups: (i) hygiene practices (wearing a face mask, washing hands with soap and water, using hand sanitizer more regularly, disinfecting home, covering nose, and mouth when sneezing or coughing), (ii) travel avoidance, and (iii) social distancing.[15,16] With the absence of vaccination during that time, non-pharmacological interventions were believed to effectively reduce the spread of COVID-19.[17]

Early COVID-19 studies discussed the role of the public's belief, knowledge, and attitudes in engaging with those behaviors.[15,18-21] Besides, some of studies used the model and theory to understand psychological influences on preventive behaviors in controlling the pandemic, such as health belief model (HBM)[22-24] and theory of planned behavior (TPB).[21,25] HBM explained that perceived susceptibility, self-efficacy, and perceived barriers were associated with COVID-19 preventive measures. At the same time, TPB expressed that perceived behavioral control, attitudes, intention, and subjective norm were associated with a greater likelihood of engaging in those behaviors.

Thus, this study aims to assess lifestyle behaviors, including smoking status, eating behavior, and physical activity and preventive behaviors, including the attitude toward COVID-19 preventive measures and the readiness for behavior changes after MCO. Apart from that, this study also compared the behaviors with the demographics profile.

Materials and Methods

Study design and setting

An online cross-sectional study was conducted on April 2020.

Study participants and sampling

Individuals who have accessed the Internet from any location were defined as internet users in this study. Malaysian aged 18 years or older who understood the Malay language and agreed to participate in the study were included and those who refused to participate by clicking disagree button were excluded. This study used a convenient sampling technique in recruiting respondents.

Data collection tool and technique

A newly developed questionnaire was developed in the Malay language by the investigators based on literature reviews, current government preventive measures, and WHO recommendations. The questionnaire encompassed three sections, including the demography, lifestyle behavior, and preventive behaviors.

Before actual data collection, this questionnaire was validated. Three experts with at least 10 years of working experience assessed the questionnaire for content validity. They consist of two experts in health education and one from the noncommunicable disease section, MOH. The research team discussed their comments, and modifications to a few statements were made.

Then, the questionnaire was piloted among 30 respondents who were not included in the study. All comments were taken into consideration, and errors were amended. It was also validated for internal consistency for the Likert scale section as follows: preventive behaviors (attitude toward preventive behavior for COVID-19 (.878)) and readiness for behavioral change after MCO (.767).

The questionnaires were then transformed into a Google Docs' form. Invitations to participate in the study were communicated through Instagram, Facebook, Telegram, WhatsApp link, and official website. The respondents were recommended to share the study link with others. The first page of the URL link was embedded with a consent statement for each respondent to answer "I agree or I disagree" to participate in the study. The study requires around 5 min for respondents to complete the questionnaires.

Data were summarized using Microsoft Excel 2019 and exported to SPSS Version 20.0 for descriptive analysis. For categorical variables, data were provided as numbers and percentages or as mean and standard deviation for continuous variables. The Shapiro–Wilk test was used to determine the distribution of variables and showed that data were normally distributed. The Chi-square test was used for comparison among groups for categorical data and independent *T*-test and one-way ANOVA tests compared continuous variables between two or more groups. The level of statistical significance was set at $P < .05$.

Ethical consideration

Ethical approval was obtained from the Medical Research and Ethics Committee (MREC) with approval number NMRR: 20-634-54511, on 1st April 2020. All respondents' data and privacy were kept confidential; no information was collected on respondents' identification and contact details.

Results

Respondent profile

A total of 9987 respondents from 13 states and 3 federal territories agreed to participate in the study. Figure 1 shows that Selangor showed the highest participation, 28.4% of the total respondents. Meanwhile, Table 1 gives the respondents' demographic profile, with 68.2% females, 67.8% married, 34.1% aged between 36 and 45 years old, and 42.3% with monthly household income between RM 4001 and RM 8000.

Table 1: The demographic characteristics of the respondents

Demography	Frequency (*n*)	%
Gender		
Male	3176	31.8
Female	6811	68.2
Age group		
18-25	1321	13.2
26-35	3008	30.1
36-45	3408	34.1
46-55	1743	17.5
56 and above	507	5.1
Marital status		
Single	2829	28.3
Married	6775	67.8
Divorce	383	3.8
Monthly household income		
<RM 4000	3038	30.4
RM 4000-RM 8000	4228	42.3
>RM 8000	2721	27.2
Occupation		
Self-employed	676	6.8
Government	5079	50.9
Private	2316	23.2
Retiree	251	2.5
Student	1024	10.2
Unemployed	641	6.4
Education		
No formal education	10	0.1
Primary school	26	0.3
Secondary school	1484	14.8
Tertiary level	8467	84.8
Living condition		
Live alone	421	4.2
With friends	439	4.4
With family	9127	91.4

The lifestyle behavior

Table 2 shows 10.3% of the respondents were smokers and nearly half of these smokers (46.7%) intended to quit smoking during the MCO. For eating behavior, 72.4% of the respondents took their three main meals daily, while breakfast was the most often skipped meal (15.7%), followed by dinner (11.0%) and lunch (6.5%). Meanwhile, only 45.1% had a complete daily intake of food groups. However, most of the respondents consumed protein (98.3%), carbohydrates (98.1%), vegetables (90.5%), and fruits (74.7%) in their daily meals, while milk and dairy products were the least taken food groups (58.2%).

Also, 94.4% of the respondents cooked their food during the MCO, while 46.5% ate more frequently than usual,

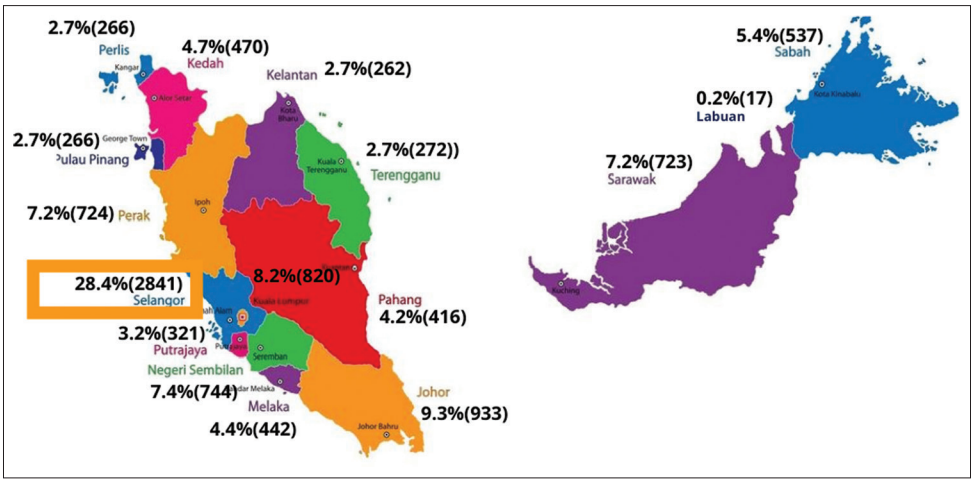

Figure 1: The distribution of respondents across various states of Malaysia

Table 2: The lifestyle behavior of respondents during MCO

Items	%	
	Yes	No
Smoking status		
No. of smokers	10.3	89.7
Smokers intending to quit smoking	46.7	53.3
Eating behavior		
Daily intake of main meals		
Breakfast	84.3	15.7
Lunch	93.5	6.5
Dinner	89.0	11.0
Complete daily intake of main meals	72.4	27.6
Daily intake of food groups		
Protein	98.3	1.7
Carbohydrate	98.1	1.9
Vegetables	90.5	9.5
Fruits	74.7	25.3
Milk and dairy products	58.2	41.8
Complete daily intake of food groups	45.1	44.9
Eating behavior		
Home cooked food	94.4	5.6
Drink at least eight glasses of plain water a day	73.8	26.2
Eat more frequently than usual	46.5	53.5
Drink sweetened beverages more frequently than usual	27.7	72.3
Eat fast/instant food more frequently than usual	18.1	81.9
Physical activity		
Most frequent activity at home (multiple answers)		
Internet surfing	18.8	
Cooking/House chores	18.2	
Sit continuously	16.9	
Watching television	16.9	
Exercise	14.4	
Study/Spiritual activity	8.8	
Gardening	6.0	
Opinion on need of physical activity		
Physical activity should be practiced during MCO	94.7	5.3
MCO is not a barrier to do physical activity	67.2	32.8

and 18.1% took fast or instant food more frequently than usual. Besides, 73.8% of the respondents took at least eight glasses of plain water daily and 27.7% took sweetened beverages. Interestingly, the most frequent activities being undertaken were internet surfing (18.8%), followed by cooking/house chores (18.2%) and sitting continuously (16.9%). This study also reported that 94.7% of the respondents agreed that physical activity should be practiced during the MCO, and 67.2% agreed that MCO was not a barrier to physical activity, while Table 3 shows that the smoking rate among males was significantly higher than females. Compared to males, females completed five main food groups a day, eating more than usual, and agreed that physical activity should be practiced during the MCO and that MCO was not a barrier to physical activity ($P < .001$).

Attitudes toward the preventive behavior for COVID-19 and readiness for behavior change after MCO

Table 4 shows that almost 98% of the respondents agreed to practicing COVID-19 preventive measures. In terms of readiness for behavioral change after MCO, 99.0% of the respondents would regularly wash their hands with water and soap, 97.7% would wear a face mask, and 96.0% would practice the 1-m social distancing. However, only 40.5% of the respondents avoided crowded places and limited social gatherings after the MCO.

In addition, this study found that females, older age group, married and divorced, and monthly household income (more than RM 8000) had significantly higher positive attitude scores toward the preventive behavior ($P < .001$) [Table 5]. Furthermore, regarding readiness for behavior change after MCO, females had a significantly higher readiness score than males ($P < .001$).

Discussion

The COVID-19 pandemic has brought inevitable health behavior changes, particularly lifestyle and preventive

Table 3: Respondent characteristics on lifestyle behaviors

Demography	Yes *n* (%)						
Response	Smoking Status (*n*=9987)	Intention to quit smoking (*n*=1027)	Complete three meals a day (*n*=9987)	Complete five main food groups a day (*n*=9987)	Eat more often than usual (*n*=9987)	Physical Activity should be practiced during MCO (*n*=9987)	MCO is not a barrier to do physical activity (*n*=9987)
Gender							
Male	910 (28.7)	433 (47.6)	3104 (97.7)	963 (30.3)	714 (22.5)	2973 (93.6)	1767 (55.6)
Female	117 (1.7)	47 (40.2)	6689 (98.2)	1807 (26.5)	1093 (16.0)	6489 (95.3)	4943 (72.6)
P	<.001	0.078	0.065	<.001	<.001	<.001	<.001
Age group							
18-25	77 (5.8)	34 (44.2)	1287 (97.4)	448 (33.9)	388 (29.4)	1225 (92.7)	797 (60.3)
26-35	343 (11.4)	176 (51.3)	2943 (97.8)	979 (32.5)	660 (21.9)	2837 (94.3)	1907 (63.4)
36-45	373 (10.9)	163 (43.7)	3351 (98.3)	901 (26.4)	530 (15.6)	3247 (95.3)	2371 (69.6)
46-55	186 (10.7)	86 (46.2)	1715 (98.4)	373 (21.4)	194 (11.1)	1668 (95.7)	1241 (71.2)
56 and above	48 (9.5)	21 (43.8)	497 (98.0)	69 (13.6)	35 (6.9)	485 (95.7)	394 (77.7)
P	<.001	0.324	0.210	<.001	<.001	<.001	<.001
Marital status							
Single	228 (8.1)	105 (46.1)	2740 (96.9)	894 (31.6)	747 (26.4)	2634 (93.1)	1710 (60.4)
Married	759 (11.2)	357 (47.0)	6680 (98.6)	1782 (26.3)	1002 (14.8)	6459 (95.3)	4722 (69.7)
Divorce	40 (10.4)	18 (45.0)	373 (97.4)	94 (24.5)	58 (15.1)	369 (96.3)	278 (72.6)
P	<.001	0.942	<.001	<.001	<.001	<.001	<.001
Monthly household income							
<RM 4000	393 (12.9)	203 (51.7)	2952 (97.2)	889 (29.3)	662 (21.8)	2848 (93.7)	1988 (65.4)
RM 4000-RM 8000	419 (9.9)	187 (44.6)	4160 (98.4)	1176 (27.8)	708 (16.7)	3998 (94.6)	2896 (68.5)
>RM 8000	215 (7.9)	90 (41.9)	2681 (98.5)	705 (25.9)	437 (16.1)	2616 (96.1)	1826 (67.1)
P	<.001	0.037	<.001	0.018	<.001	<.001	0.023

Tested using Chi-square test

Table 4: Attitudes toward the preventive behavior for COVID-19 and Readiness for behavior change after MCO

Items	Totally disagree *n* (%)	Disagree *n* (%)	Agree *n* (%)	Totally agree *n* (%)	Mean (SD)
Attitudes toward the preventive behavior for COVID-19					
Main preventive measures					
I will ensure my house keep clean to protect myself and family from COVID-19	42 (.4)	50 (.5)	3139 (31.4)	6756 (67.6)	3.66 (.509)
I wash my hands with soap and water or use hand sanitizer regularly to avoid COVID-19	73 (.7)	35 (.4)	2770 (27.7)	7109 (71.2)	3.69 (.513)
I will be practicing social distancing 1 m when meet people outside	51 (.5)	68 (.7)	2940 (29.4)	6928 (69.4)	3.68 (.513)
I will be wearing a face mask if I have health problem (cough/fever)	60 (.6)	102 (1.0)	2929 (29.3)	6896 (69.0)	3.67 (.527)
I comply with MCO by staying at home	129 (1.3)	60 (.6)	2262 (22.6)	7536 (75.5)	3.72 (.538)
What to do when sick					
I will seek medical consultation if I have cough/fever or difficulties in breathing	46 (.5)	73 (.7)	2483 (24.9)	7385 (73.9)	3.72 (.493)
I will avoid meeting with others if I have cough/fever or difficulties in breathing	48 (.5)	36 (.4)	2202 (22.0)	7701 (77.1)	3.76 (.469)
I will disclose travel history and close contact with positive COVID-19 case to healthcare provider if I get screening treatment	49 (.5)	23 (.2)	1831 (18.3)	8084 (80.9)	3.80 (.442)
I will notify the nearest clinic or hospital if any of household member shows symptoms of COVID-19	44 (.4)	23 (.2)	2033 (20.4)	7887 (79.0)	3.78 (.451)
Readiness for behavior change after MCO					
Washing hands with soap and water regularly	35 (.4)	58 (.6)	3750 (37.5)	6144 (61.5)	3.60 (.522)
Wearing a face mask	39 (.4)	196 (2.0)	3804 (38.1)	5948 (59.6)	3.51 (.591)
Practicing social distancing at least one meter	47 (.5)	349 (3.5)	4034 (40.4)	5557 (55.6)	3.57 (.555)
Avoiding crowded places and limit social gatherings	1966 (19.7)	3970 (39.8)	3109 (31.1)	942 (9.4)	2.30 (.891)

behavior. Lifestyle behavior such smoking, physical activity, and diet have been proven to impact chronic disease, mortality, and even mental health.[12,16,26-28] Similar to the findings of other studies,[29] this study

Table 5: Differences between demographic characteristics of respondent on attitude toward the preventive behavior for COVID-19 and readiness for behavior change after MCO

Demography	*n*	%	Attitude score Mean (standard deviation)	*t/F*	*P*	Readiness score Mean (standard deviation)	*t/F*	*P*
Gender								
Male	3176	31.8	33.07 (3.833)	8.050	<.001[a]	12.93 (1.695)	2.102	0.036
Female	6811	68.2	33.66 (3.184)			13.01 (1.720)		
Age group								
18-25	1321	13.2	32.98 (3.275)	11.211	<.001[b]	12.97 (1.766)	0.292	0.883[b]
26-35	3008	30.1	33.39 (3.293)			12.99 (1.709)		
36-45	3408	34.1	33.63 (3.445)			12.99 (1.707)		
46-55	1743	17.5	33.70 (3.510)			12.94 (1.712)		
56 and above	507	5.1	33.49 (3.783)			13.00 (1.629)		
Marital status								
Single	2829	28.3	33.12 (3.352)	21.933	<.001[b]	13.00 (1.731)	0.213	0.808[b]
Married	6775	67.8	33.62 (3.416)			12.97 (1.711)		
Divorce	383	3.8	33.62 (3.653)			12.99 (1.594)		
Monthly household income								
<RM 4000	3038	30.4	33.34 (3.340)	13.247	<.001[b]	12.96 (1.726)	1.403	0.246[b]
RM 4000-RM 8000	4228	42.3	33.39 (3.514)			13.01 (1.689)		
>RM 8000	2721	27.2	33.76 (3.324)			12.95 (1.733)		

[a]Tested using independent *t*-test, [b]Tested using one-way ANOVA tests, $P<0.05$ is considered significant

found that the pandemic allowed smokers to consider quitting smoking, especially since the risk of smokers contracting COVID-19 was substantially higher than nonsmokers.[30,31] The evidence also suggests that smokers who intend to quit smoking should use a combination of stop-smoking medicines and behavioral support to give them the best chances of success.[32]

Meanwhile, on eating behavior, although 72.4% of the respondents took their three main meals, breakfast was the most-often skipped meal probably because when confined at home, the respondents tended to stay up late playing with their smartphones or watching television and waking up late on the following day. On the other hand, only 45.5% had the complete daily food groups of proteins, carbohydrates, vegetables, fruits, milk, and dairy products during the lockdown. The respondents' most negligible food group intake was milk and dairy products. Each needs to consume adequate amounts of food groups as the insufficient intake of nutrients would increase a person's vulnerability to infections.[33] Besides that, a healthy balanced diet is considered a personal risk management strategy during COVID-19.[34]

Parallel to other studies,[8,35,36] 94.4% of the respondents in this study prepared their food during the MCO, which could be deemed a healthier lifestyle since fewer food additives and preservatives were used.[37] Eating more home-cooked meals might be related to the panic shopping behaviors during the MCO. This study also identified that 46.5% of the respondent ate more frequently than usual. These results align with previous studies that identified almost half of their respondents ate more often during the lockdown.[8,35,36] The disruption of daily life routines caused by lockdown could result in boredom, which will be associated with a greater energy intake.[38] The COVID-19 lockdown had modified, for better or for worse, the individual eating behavior. For some people, it creates opportunities to improve their eating behavior but some of them tend to adopt unhealthy behaviors that result in long-term effects.[39]

The finding of relatively high usage of media and social media (18.8%) and home cleaning (18.2%) among the respondents during the lockdown was in line with the results of another study.[35] This study also found exercise among the lowest activity reported in this survey. A study in Indonesian among young adults was revealed a significant decline in physical activity during the COVID-19 pandemic due to work.[40] Physical inactivity is also being called another pandemic for several years,[41] and it can be expected that people may be moving even less during the COVID-19 lockdown.

Individual responsibility toward practicing preventive behavior is as important as government action on preventing the spread of COVID-19.[42] In this study, the respondents showed a positive attitude toward overcoming the pandemic, and most of them voluntarily adhered to the preventive measures. The findings were similar to one Malaysia study conducted in May 2020, which found that many respondents adhered to preventive behaviors.[43] Nevertheless, discoveries from a discourse analysis on Facebook posting related to COVID-19 in Malaysia reveal that a widespread utilization of terminologies of unity like "we" and "us" that has been shared repetitively among laymen has suggested solidarity and empowerment

among Malaysians in fighting the pandemic.[44] This positive spirit may potentially lead to voluntary participation in adherence to preventive measures. A scoping review discovered several determinant factors influencing the adoption of COVID-19 preventive behaviors, including socio-demographic factors (age, gender, and education level), social psychological factors (perceived severity, barriers, benefits, susceptibility, self-efficacy), knowledge about COVID-19, health status factor (family or personal), and enabling factors (lack of government push, media exposure, access to information, access to healthcare, and social support).[45]

Regarding readiness for behavior change, this study revealed that most respondents agreed to wash hands with water and soap regularly, wear a face mask, and practice social distancing at least 1 m after the MCO. However, only 40.5% of the respondents agreed to avoid crowded places and limit social gatherings after the MCO ended. The study's result in Iran reported a reduction in outside activity due to reason on awareness of the symptoms and ways of prevention during the pandemic.[46] However, since the pandemic is still ongoing, constant reinforcement of government measures is essential.[47] Moreover, in order to embrace the behavior change among the public, knowledge, attitude, and practices play a vital role.[18]

In the absence of adequate medical treatments or a vaccine during the early phase of COVID-19, the only way to overcome the pandemic is probably behavioral changes.[19] Although nurturing behavioral change was challenging, motivating people to adopt preventive measures and creating social norms would likely help delay the spread of COVID-19.[48-50] Besides, health promotion was crucial in contributing to the targeted behavioral change by focusing on individual disease management, interventions that affected communities, and informing policies that affected the population.[37] The present findings agree with the earlier work conducted in India, China, Philippines, and Malaysia, whereby most respondents reflect a positive perception of compliance with COVID-19 preventive behaviors.[18,48,51,52] Moreover, one study reported that acceptance of preventive behaviors significantly correlated with risk perception of COVID-19. They believe that raising awareness and promoting risk perception is vital to strengthen health intervention programs.[46]

Limitations and recommendation

This study also has several limitations, such as only internet users who can use technology and the internet are expected to participate and female and young adults' predominance in participation. Therefore, there is a possibility of bias as underprivileged populations may not have participated and no direct observation of the respondents' actual behaviors. The findings also cannot be generalized to the entire population.

Furthermore, as the COVID-19 pandemic is still ongoing, this study's findings need to be confirmed and investigated in future, more extensive population studies. Despite these limitations, the findings were able to describe Malaysian lifestyle and preventive behaviors as it was carried out promptly at the most crucial stage, less than 4 weeks after MCO was implemented. This finding is valuable for the public health to plan effective public health campaigns and designing relevant regulation policies to promote a healthy lifestyle and adoption of preventive behaviors as a new norm.

Conclusion

In summary, the findings may provide valuable insights to promote maintaining a healthy lifestyle during the COVID-19 pandemic. Besides that, although the findings show that most respondents show a positive attitude toward adopting preventive behaviors, the additional analysis exposed that men, single, high levels of monthly household income, and young adults have had a lower score on the attitudes toward preventive behaviors and readiness for change after MCO. As COVID-19 evolves, continuous efforts to promote positive behavioral changes are needed to ensure the public practices' healthy lifestyle and comply with preventive measures, especially for those lowest score groups.

Author contributions

All authors contributed to the study conceptualization, methodology, validation, material preparation, and data collection. Data analysis was performed by Norbaidurah Ithnain and Khairul Amar Musa. The first draft of the manuscript was written by Norbaidurah Ithnain and all authors commented on previous versions of the manuscript. All authors have read and agreed to the published version of the manuscript.

Ethical consideration

Ethical approval for this study was obtained from the MREC with approval number NMRR: 20-634-54511. All respondents' data and privacy were kept confidential; no information was collected on respondents' identification and contact details. The collected data were recorded in a separate offline document (Microsoft Excel), after which all data in the Google Form were deleted. In addition, the link was disabled, and no other person except the investigator could access it.

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There are no conflicts of interest.

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