Original Article

Knowledge, attitudes and practices regarding COVID-19 among the Turkish and Malaysian general populations during lockdown: A cross-sectional online survey

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Abstract

Background: COVID-19 is public health threat across the globe. The aim of the study is to assess the knowledge, attitudes and practices of the Turkish and Malaysian general populations regarding COVID-19 during the lockdown.

Methods and materials: A cross-sectional quick survey was conducted online on 01-07 April 2020. Data were collected from samples of the general public in both Turkey and Malaysia.

Results: A total of 1,320 people from the two countries participated in the study. In Turkey, only gender and education were demonstrated to have an association with overall knowledge (p<0.001), while in Malaysia it was shown that age and marital status (p<0.001) were statistically significant. In Turkey, those who had a good attitude towards COVID-19 were mostly male, married and postgraduates; in Malaysia, females, married those who had completed a middle-school education, and postgraduates demonstrated a good attitude towards COVID-19. In Turkey, 55.3% of study participants wore masks and 90.9% avoided crowded places; in Malaysia, 87.1% wore masks and 93.4% avoided crowded places.

Conclusions: Participants had good knowledge about COVID-19, however they also showed misconceptions about COVID-19, especially in relation to its transmission. Participants' confidence was high and they believe that their country can win the battle against the COVID-19 virus. [*Ethiop. J. Health Dev.* 2020; 34(4):243-252]

Key words: COVID-19; knowledge, attitudes and practices; Turkish community; Malaysian community; pandemic

Introduction
The first epidemic outbreak of the novel coronavirus 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged in December 2019 (1). The World Health Organization (WHO) named the disease 'coronavirus disease 2019' or COVID-19 (2). The virus spread rapidly from Huanan seafood wholesale market in Wuhan City, Hubei Province, China to other parts of China and to countries such as South Korea, Japan, Iran and Italy (3). The WHO declared COVID-19 a 'pandemic' on 12 March 2020 (2).

As at 24 September 2020, across the globe there have been 32,408,504 coronavirus cases, 987,724 deaths, and 23,924,977 recoveries. The United States of America (USA) has the highest number of coronavirus cases (7,185,471) and the highest number of deaths (207,538) (2).

The SARS-CoV-2 is a β-coronavirus, which is an enveloped positive-sense single-stranded ribonucleic acid (RNA) virus ranging from 60-140 nm in diameter (4). The Chinese scientists found that the virus had more than 95% homology with bat coronavirus (5). However, the current pandemic of COVID-19 is propagated by human-to-human transmission, and it is hypothesized that initially, the SARS-CoV-2 virus transmitted from animals to humans via the consumption of infected meat (6, 7).

The transmission of SARS-CoV-2 virus is through fluid droplets from the nose or mouth, normally via coughing or sneezing (8, 9). Older people with chronic diseases such as diabetes, hypertension, heart problems, liver diseases; pregnant women; and smokers face increased risk of the spread and transmission of COVID-19 infections (10).

The first case of COVID-19 in Turkey was reported on 11 March 2020 (8). Within a month, the WHO was concerned about the rapid spread of the disease in the country. As of 24 September 2020, there have been 309,790 cases; 7,785 deaths; and 271,964 recoveries in Turkey (2). Turkey has a population of around 82 million people. It currently has the highest acceleration rate for cases after Italy. More than 600 healthcare personnel have been infected with COVID-19 across Turkey.

Malaysia confirmed a total of 10,576 cases, 133 deaths and 9,666 recoveries as at 24 September 2020 (2). Malaysia has a population of approximately 32 million people. On 25 January 2020, the first COVID-19 case was detected (11,12). The rate of cases grew slowly until a large spike developed in March 2020, following a religious event held at Kuala Lumpur (13,14). Two further clusters (a religious gathering at Kuching and a wedding at Bandar Baru Bangi) led to 171 confirmed COVID-19 cases (15, 16). According to the Ministry of Health (MoH), these two clusters have reached a fifth-generation of infections.

Limited knowledge, negative attitudes and bad practice have contributed to the high of risk of infection and negative impact caused by COVID-19. For example, as noted above, the religious event that took place at Sri Petaling, Kuala Lumpur, led to an exponential increase in cases (17). After a few weeks of the gathering, the number of positive COVID-19 cases in Malaysia was highest among South East Asia countries. It was

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breaching the 2,000 active cases mark by the end of March, from fewer than 30 cases at the beginning of the month. The event took place over four days. About 16,000 people, including locals and foreigners, attended the event (18). A proper standard operating procedure (SOP) was not followed during the proceedings, and COVID-19 cases spread to other countries, such as Brunei, Singapore, Thailand, Philippines, Vietnam and Indonesia (19-22). Standard operating procedures are important to prevent and control disease more efficiently. Most countries have implemented movement control orders (MCOs) as preventive measure by governments to avert the growth of COVID-19 cases by social distancing (23,24).

This study aims to determine the knowledge, attitudes and practices (KAP) of Turkish and Malaysian people regarding the prevention of COVID-19 disease, and to evaluate the relationship between the demographic variables and KAP scores among these population groups during the rapid rise of the COVID-19 outbreak. This study could be significant and of value in contributing to the development of strategies for future pandemic disease outbreaks.

Methods and materials
Study design: A web-based survey was conducted on 01-07 April 2020 in Turkey and Malaysia. People who participated in the study understood the content of the questionnaire, and informed consent was obtained from each participant prior to their participation. The study was conducted following the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines and the 2013 Helsinki Declaration (25).

Assessment tool: The first part of our questionnaire focused on sociodemographic characteristics such as age, gender, education, marital status and occupation. The second part consisted of statements/questions evaluating KAP in relation to COVID-19. The COVID-19 questionnaire was developed by Zhong and colleagues (26). The 12-item statements were divided into three parts: transmission routes (4 items); clinical presentations (3 items); and prevention and control (5 items). A correct answer was assigned 1 point, and each participant's total knowledge score ranged from 0 to 12. A higher score denotes a better knowledge of COVID-19. Practices and attitudes towards COVID-19 were each measured using two questions. The English version of the questionnaire was used in Malaysia; a Turkish translation of the questionnaire was used in Turkey. The English questionnaire was translated into Turkish and back translated into English. Prior to the survey, the questionnaire was pre-tested by 25 Turkish respondents to assess its clarity, sequencing, and time needed to complete it.

Data analysis: The statistical analysis was performed with IBM SPSS software (version 23.0). Descriptive analysis was used to present all variables by using frequency and percentage for categorical variables, and mean±SD for numerical variables. To determine the association between knowledge, attitude and practice with all demographic factors, Pearson correlation tests, independent samples t tests, and chi-squared and one-way ANOVA tests were performed. A value of $p<0.05$ was considered statistically significant.

The questions were used to assess the KAP of participants from both countries on the basis of the frequency and percentage of those who answered true or false/yes or no to 16 statements and questions. As noted above, of the 16 questions used to assess awareness of COVID-19 among participants, 12 were used to assess knowledge, two to assess attitude, and two to assess practice. In order to calculate overall knowledge, the option 'true' was the correct response to items 1, 2, 3, 4, 7, 8, 10, 11 and 12, while the option 'false' was the correct response for items 4, 5 and 9. In addition, answering 'yes' was the correct response to items 13, 14 and 16, and answering 'no' was the correct answer to question 15.

To calculate the overall KAP score, the correct answer was coded '1' and the wrong answer was coded '0' for all 16 questions. By adding all the correct answers for Q1 to Q12, knowledge was obtained. Likewise, Q13 and Q14 were added to assess overall attitude, and Q15 and Q16 to assess overall practice. Overall attitude and practice were categorized as 'good' or 'poor'. If a participant correctly answered both questions for either attitude or practice, they would be categorized as having a 'good' attitude or practice. Otherwise, they would be categorized as having 'poor' attitude or practice.

Results
Descriptive analysis – Description of demographic factors: The results of the study are presented using descriptive analysis and bivariate analysis. Mean±SD was used to describe the numerical variables, and frequency and percentage for categorical variables. Independent samples t tests, Pearson correlation tests, one-way ANOVA and chi-squared tests were used for bivariate analysis to show the association between knowledge, attitude and practice and the demographic factors in both countries. A total of 913 participants from Turkey between 18-64 years old (mean±SD = 26.7±9.5) and total of 410 participants from Malaysia between 17-70 years old (mean±SD = 36.5±12.7) completed the survey. Most of the participants in Turkey and Malaysia were females – 59.8% and 59.5%, respectively. Participants who had completed high school education only were in the majority in the Turkish population (59.4%), while postgraduates were in the majority in Malaysia (47.8%). In Turkey, most participants were single (68.3%) and students (60.0%), while in Malaysia most were married (57.6%) and students (25.9%) (see Table 1).

Table 1: **Descriptive analysis to compare the demographical factors of Turkish and Malaysian participants**

Variable	Turkey		Malaysia	
	N	**(%)**	**N**	**(%)**
Age	26.7±9.5*		36.5±12.7*	
Gender				
Male	367	40.2	166	40.5
Female	546	59.8	244	59.5
Education				
Primary school	11	1.2	6	1.5
Middle school	14	1.5	10	2.4
High school	542	59.4	42	10.2
Undergraduate	213	23.3	156	38.0
Postgraduate	133	14.6	196	47.8
Marital status				
Married	283	31.0	236	57.6
Single	624	68.3	167	40.7
Divorced	6	0.7	7	1.7
Occupation				
Doctor	40	4.4	52	12.7
Nurse	11	1.2	44	10.7
Pharmacist	2	0.2	1	0.2
Other healthcare workers	50	5.5	11	2.7
Police	1	0.1	39	9.5
Teacher	66	7.2	13	3.2
Housewife	39	4.3	16	3.9
Student	548	60.0	106	25.9
Retired	2	0.2	15	3.7
Laborers	0	0	3	0.7
Government servant	30	3.3	16	3.9
Private sector	79	8.7	59	14.4
Others	45	4.9	35	8.5
Total	913	100	410	100

Descriptive analysis – Description of knowledge, attitude and practice in Turkey and Malaysia: Most of the participants from both countries responded correctly to the statements and questions, as shown in Table 2. It was demonstrated that they have good knowledge about COVID-19. The majority of the participants from Turkey and Malaysia answered 'yes' to both attitude questions (A1: Do you agree that COVID-19 will finally be successfully controlled? – 65.8% and 77.6%, respectively; and A2: Do you have confidence that Turkey/Malaysia can win the battle against the COVID-19 virus? – 67.5% and 83.9%, respectively). For practice, most of the participants in Turkey and Malaysia answered 'no' to question P1 (In recent days, have you gone to any crowded place? – 90.9% and 93.4%, respectively), while most answered 'yes' to question P2 (In recent days, have you worn a mask when leaving home? – 55.3% and 87.1%, respectively) (see Table 2).

Table 2: **Descriptive analysis for knowledge, attitude and practice in Turkey and Malaysia**

Statements / Questions	Answer	Turkey		Malaysia	
		N	(%)	N	(%)
Knowledge					
K1: The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia.	True	862	94.4	371	90.5
	False	28	3.1	25	6.1
	Don't know	23	2.5	14	3.4
K2: Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	True	524	57.4	281	68.5
	False	193	21.1	89	21.7
	Don't know	196	21.5	40	9.8
K3: There currently is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection.	True	843	92.3	378	92.2
	False	20	2.2	11	2.7
	Don't know	50	5.5	21	5.1
K4: Not all persons with COVID-19 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	True	742	81.3	335	81.7
	False	107	11.7	49	12.0
	Don't know	64	7.0	26	6.3
K5: Eating or contacting wild animals would result in the infection by the COVID-19 virus.	True	409	44.8	145	35.4
	False	294	32.2	176	42.9
	Don't know	210	23.0	89	21.7
K6: Persons with COVID-19 cannot infect the virus to others when a fever is not present.	True	26	2.8	23	5.6
	False	786	86.1	357	87.1
	Don't know	101	11.1	30	7.3
K7: The COVID-19 virus spreads via respiratory droplets of infected individuals.	True	724	79.3	373	91.0
	False	65	7.1	14	3.4
	Don't know	124	13.6	23	5.6
K8: Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus.	True	595	65.2	291	71.0
	False	258	28.3	98	23.9
	Don't know	60	6.6	21	5.1
K9: It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	True	55	6.0	36	8.8
	False	830	90.9	354	86.3
	Don't know	28	3.1	20	4.9
K10: To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations.	True	889	97.4	394	96.1
	False	12	1.3	5	1.2
	Don't know	12	1.3	11	2.7
K11: Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	True	881	96.5	389	94.9
	False	13	1.4	7	1.7
	Don't know	19	2.1	14	3.4
K12: People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days.	True	892	97.7	396	96.6
	False	10	1.1	6	1.5
	Don't know	11	1.2	8	2.0
Attitude					
A1: Do you agree that COVID-19 will finally be successfully controlled?	Yes	601	65.8	318	77.6
	No	312	34.2	92	22.4
A2: Do you have confidence that Turkey/Malaysia can win the battle against the COVID-19 virus?	Yes	616	67.5	344	83.9
	No	297	32.5	66	16.1
Practice					
P1: In recent days, have you gone to any crowded place?	Yes	83	9.1	27	6.6
	No	803	90.9	383	93.4
P2: In recent days, have you worn a mask when leaving home?	Yes	505	55.3	357	87.1
	No	408	44.7	53	12.9

Bivariate analysis – Association between knowledge, attitude and practice and demographic factors in Malaysia and Turkey: The association between knowledge and all demographic factors was correlated. Only gender and education were demonstrated to have an association with knowledge (p<0.001) in Turkey, while age (p<0.001), marital status (p<0.001) and education (p=0.006) showed statistically significant associations with knowledge in Malaysia (see Table 3). In addition, knowledge as a dependent variable was tested for its association with attitude. It was shown that knowledge had a statistically significant association with attitude in Malaysia only (p≤0.001) (see Table 3).

Table 3: **Association between knowledge and demographic factors in Malaysia and Turkey**

Characteristic		Knowledge					
		Turkey			**Malaysia**		
	Mean±SD	**Test value**	**P-value**		**Mean±SD**	**Test value**	**P-value**
Age	26.6±9.5*	0.022*	0.503		37.5±27.1*	0.174*	**<0.001**
Gender		3.53**	**<0.001**			1.930**	0.054
Male	7.9±1.8				9.8±2.2		
Female	8.3±1.4				10.1±1.5		
Marital status		1.82***	0.162			15.306***	**<0.001**
Married	8.1±1.7				10.4±1.4		
Single	8.2±1.5				9.41±2.2		
Divorced	9.2±0.9				10.7±0.7		
Education		7.52***	**<0.001**			3.717***	**0.006**
Primary school	5.8±3.8				8.83±2.1		
Middle school	7.5±2.4				8.60±3.5		
High school	8.2±1.5				9.60±2.5		
Undergraduate	8.1±1.6				9.90±1.5		
Postgraduate	8.4±1.2				10.25±1.7		
Attitude		0.63	0.531			5.87**	**≤0.001**
Good	8.1±1.6				10.0±1.3		
Poor	8.2±1.6				9.0±2.7		

*Mean±SD presented and Pearson correlation test; **Independent samples t test; ***One-way ANOVA test.

The association between attitude and demographic factors was tested, revealing that most of the participants with good attitudes in Turkey were male, married and postgraduates, while in Malaysia, most of those with good attitudes were female, married, those who had completed a middle-school education, and those with postgraduate qualifications. Bivariate analysis showed that only marital status was statistically associated with attitude (p=0.042 and p=0.005 for Turkey and Malaysia, respectively). Other factors (age, gender and education) showed no such association for either population (p≥0.05) (see Table 4).

Table 4: **Association between attitude and demographic factors in Turkey and Malaysia**

Characteristics		Attitudes						
	Turkey		**Test value**	**P-value**	**Malaysia**		**Test value**	**P-value**
	Good N (%)	**Poor N (%)**			**Good N (%)**	**Poor N (%)**		
Age*	27.1±9.7	25.9±9.2	1.76	0.080	37.3±12.6	38.6±50.3	0.43	0.669
Gender			2.51	0.113			0.35	0.556
Male	229 (62.4)	138 (37.6)			123 (74.1)	43 (25.9)		
Female	312 (57.1)	234 (42.9)			187 (76.6)	57 (23.4)		
Marital status			6.36	**0.042**			10.41	**0.005**
Married	183 (64.7)	100 (35.3)			192 (81.4)	44 (18.6)		
Single	356 (57.1)	268 (42.9)			114 (68.3)	53 (31.7)		
Divorced	2 (33.3)	4 (66.7)			4 (57.1)	3 (42.9)		
Education			2.01	0.733			5.17	0.0270
Primary school	6 (54.5)	5 (45.5)			3 (50.0)	3 (50.0)		
Middle school	8 (57.1)	6 (42.9)			8 (80.0)	2 (20.0)		
High school	318 (58.7)	224 (41.3)			30 (71.4)	12 (28.6)		
Undergraduate	123 (57.7)	90 (42.3)			113 (72.4)	43 (27.6)		
Postgraduate	86 (64.7)	47 (35.3)			156 (79.6)	40 (20.4)		

*Mean±SD presented and independent samples t test used; **Chi-squared test used.

It was demonstrated that most participants with good practice were adults – 26.5±9.5 years in Turkey, and 37.5±27.8 years in Malaysia. Good practice was mostly found among females and married people in both countries. In terms of education, good practice was especially found among the high school group in Turkey and the postgraduate group in Malaysia. Bivariate analysis reported that only gender was statistically associated with practice (p≤0.001) in Turkey. Other factors (age, marital status and education) showed no association (p≥0.05). In Malaysia, no factors were reported to be associated with practice (p≥0.05). Practice, as a dependent variable, was tested with knowledge and attitude in both countries. It was found that the Turkish participants with good practice had good knowledge and attitudes. The associations between practice and knowledge, and practice and attitude, were statistically significant in Turkey (p≤0.001 and p=0.005, respectively), but not in Malaysia (p>0.05) (see Table 5).

Table 5: **Association between practice and demographic factors, knowledge and attitude in Turkey and Malaysia**

| Characteristics | Turkey | | Test value | P-value | Malaysia | | Test value | P-value |
	Practice				Practice			
	Good N (%)	Poor N (%)			Good N (%)	Poor N (%)		
Age*	26.5±9.5	26.7±9.5	0.372	0.710	37.5±27.8	39.3±10.8	0.31	0.757
Gender**			12.42	**≤0.001**			0.015	0.903
Male	158 (43.1)	209 (56.9)			156 (94.0)	10 (6.0)		
Female	300 (54.9)	246 (45.1)			230 (94.3)	14 (5.7)		
Marital status**			0.080	0.961			1.15	0.564
Married	140 (49.5)	143 (50.5)			220 (93.2)	16 (6.8)		
Single	315 (50.5)	309 (49.5)			159 (95.2)	8 (4.8)		
Divorced	3 (50.0)	3 (50.0)			7 (100.0)	0 (0.0)		
Education**			7.86	0.097			1.30	0.861
Primary school	4 (36.4)	7 (63.6)			6 (100.0)	0 (0.0)		
Middle school	11 (78.6)	3 (21.4)			10 (100.0)	0 (0.0)		
High school	227 (51.1)	265 (48.9)			40 (95.2)	2 (4.8)		
Undergraduate	108 (50.7)	105 (49.3)			147 (94.2)	9 (5.8)		
Postgraduate	58 (43.6)	75 (56.4)			183 (93.4)	13 (6.6)		
Knowledge	8.4±1.1	3.7±2.0	25.66	**≤0.001**	9.9±1.4	10.0±1.8	0.08	0.935
Attitude**			7.709	**0.005**			3.54	0.059
Good	292 (54.0)	249 (46.0)			288 (92.9)	22 (7.1)		
Poor	166 (44.6)	206 (55.4)			98 (98.0)	2 (2.0)		

*Mean±SD presented and independent samples t test used; **Chi-squared test used.

Bivariate analysis – Differences in knowledge, attitude and practice in Turkey and Malaysia: The differences between Turkish and Malaysian participants regarding knowledge, attitude and practice were tested by comparing percentages, as the sample sizes were different in each country. Table 6 shows that there was a significant difference between Turkish and Malaysian participants regarding knowledge, attitude and practice (p≤0.001).

Table 6: **Differences in knowledge, attitude and practice in Turkey and Malaysia**

| Variable | Country | | Test value | P-value |
	Turkey Mean±SD	Malaysia Mean±SD		
Knowledge	8.15±1.6	9.99±1.8	18.56	**≤0.001**
	N (%)	N (%)		
Attitude			137.71	**≤0.001**
Good	541 (59.3)	310 (75.6)		
Poor	372 (40.7)	100 (24.4)		
Practice			204.53	**≤0.001**
Good	458 (50.2)	386 (94.1)		
Poor	455 (49.8)	24 (5.9)		

*Mean±SD presented and independent samples t test used; **Chi-squared test used.

All data for both countries were merged and analysed to show the impact of overall knowledge on attitude, and knowledge and attitude on practice. Table 7 shows that those who had good knowledge showed good attitude. This relation between knowledge and attitude was statistically significant (p≤0.001). Equally, those who had good knowledge also had good practice. Overall, practice had a significant association with both knowledge and attitude (p≤0.001).

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Table 7: **Association between overall knowledge, attitude and practice for all participants in Turkey and Malaysia**

Variables	Knowledge Mean±SD		Test value	P-value
Attitude			9.64	**≤0.001**
Good	9.2±1.78			
Poor	8.2±1.8			
	Practice		**Test value**	**P-value**
Variables	**Good**	**Poor**		
Knowledge	9.2±1.78	8.2±1.8	9.64	**≤0.001**
Attitude			88.24	**≤0.001**
Good	580 (68.1)	271 (31.9)		
Poor	264 (55.9)	208 (44.1)		

Discussion
The aim of the study is to determine KAP in relation to COVID-19 among Turkish and Malaysian people during the COVID-19 pandemic. In total, 913 participants from Turkey and 410 participants from Malaysia completed the survey.

KAP for communicable diseases such as COVID-19 can be influenced by various factors, including the severity of its spread and fatality rate (27). In our study, most of the participants from both countries responded correctly to all knowledge statements. This shows that they have a good knowledge about COVID-19. In the period between identification of the first case of COVID-19 in China and its emergence in other countries, people tried to search for information about this unknown disease via news channels, social media, official government websites and so on. (28). Experts in public health and infectious diseases informed people about COVID-19 using these sources. In addition, WHO and the health ministries of countries informed their citizens about controlling the epidemic and the characteristics of the disease. Citizens were afraid of the disease and showed information-seeking behavior due to reasons such as unknown characteristics of the disease, transmission rate and fatality rate. This behavior has increased people's knowledge about COVID-19.

Obtaining correct information is crucial for controlling the epidemic worldwide. Combating the epidemic will be more successful if citizens source the correct information and implement the required behaviors.

In a study conducted in China, the correct answer rates for questions in the COVID-19 knowledge questionnaire were 70.2-98.6% (26). In Turkey, only gender and education were demonstrated to have an association with overall knowledge. With regard to Malaysia, it was shown that age, marital status and education were statistically significant with the overall knowledge score. In both countries, the level of knowledge about the disease was found to be high in individuals with a high level of education. This situation is to be expected when the possibilities of access to information are evaluated. Similarly, in a study by Li *et al.*, being female and having a high education status were associated with participating in disease prevention measures (29). In the current study, the majority of the participants from both countries answered 'yes' to both attitude questions about COVID-19.

Participants in our study were hopeful about controlling and ending the COVID-19 outbreak. Receiving regular public information, complying with control measures and trusting healthcare professionals make people hopeful in the face of the epidemic. Indeed, in a study by Zhou *et al.*, people with a high level of knowledge about the disease held a strong belief that we will win the battle against the COVID-19 virus (30). In Turkey, it was revealed that those who have a good attitude were male, married and postgraduates. In Malaysia, it was demonstrated that those who have a good attitude were female, married and who had completed a middle school education and postgraduate qualifications.

The results from the study by Zhong *et al.* indicate that females, people who have high education levels, who have a high socioeconomic status, and who have sufficient knowledge about COVİD-19, have a good attitude (26).

In relation to practice, most of the participants in Turkey and Malaysia answered 'no' to question P1 (In recent days, have you gone to any crowded place? – 88.0% and 91.7%, respectively), while most of them answered 'yes' to question P2 (In recent days, have you worn a mask when leaving home? – 55.3% and 87.1%, respectively).

The new coronavirus is a respiratory virus which spreads primarily through droplets generated when an infected person coughs or sneezes, or through droplets of saliva or discharge from the nose. It can also be transmitted from infected surfaces (31). For this reason, avoiding crowded places and using masks, particularly in crowded places, are very important in protecting against infection. In both countries, the rates of not

entering crowded places are similar. In Turkey, most participants who performed good practice in not going to crowded places were male, single and in high school. In Malaysia, most participants who followed good practice to not go to crowded places and to wear masks outside of the home were females, married and had completed postgraduate study. However, the proportions of participants who used masks outside the home were different. In Turkey, the obligation to wear a mask outside of the home, in places such as grocery stores and markets while in Malaysia the obligation can be applied in other different places. Therefore, a rate difference may have occurred between both countries.

In addition, most of those who wore masks were female, single and in high school. In bivariate analysis, all variables, including age, gender and education, were associated with practice regarding question P1, except for marital status. Likewise, gender and education only showed a significant association with question P2, while age and marital status showed no association.

In our study, it is expected that women and people with higher education levels adopt good practices, such as wearing masks and not entering crowded places more frequently. Also, in our study, it was found that single individuals adapt more easily to these measures. However, we think that married people should have adapted more easily than they did in order to prevent infecting other family members living at home. The use of social media by older adults is still low compared to young people like single and students. Therefore, young people are more aware on current issues such as covid 19 pandemic. Zhong *et al.* note that females, married people, people who have high education levels and who have sufficient knowledge about COVİD-19 perform good practices (26).

The end of the COVID-19 outbreak depends on the use of appropriate personal protective equipment, maintaining appropriate social distancing and applying disinfectant. Roy *et al.* show that the knowledge and attitudes of the public greatly affect compliance in the application of personal protective measures and clinical outcomes related to COVID-19 (32). In this sense, attitudes towards the control of the epidemic are related to knowledge about ways to ensure protection from it. In our study, it was determined that knowledge had a statistically significant association with attitude in Malaysia only. However, we determined that those who have good knowledge showed good attitude and good practice. Similarly, Azlan *et al.* report that participants with good knowledge about COVID-19 show better attitudes and practices (33). The proportion with poor attitudes towards the end of the COVID-19 outbreak was higher in Turkey than in Malaysia. Similarly, the proportion with poor practices regarding measures related to preventing COVID-19 were higher in the Turkey sample. These differences may be due to differences perception about causes, transmission and disease control. On the other hand, the overall practice results show that those who have good attitudes exhibit good practices. Zhong *et al.* also indicate the relationship between good practice, good attitude and sufficient level of knowledge (26).

Limitations of this study
First, the study was carried out during the lockdown in Malaysia and Turkey. Consequently, we had to use online survey methods to collect the data, so only those who had easy access to web-based technology participated to the study. Second, we used a questionnaire that developed by other researchers, the original questionnaire included only two to assess attitude and two to assess practice, these may not enough to assess attitude and practice. Third, due to the study design, the findings of the study may not be representative of the Turkish and Malaysian populations as a whole.

Conclusions
Generally, Turkish and Malaysian participants demonstrated that they have good knowledge about COVID-19. However, they also show important misconceptions about COVID-19, especially regarding its transmission. The majority of participants in both countries believe that the virus will finally be successfully controlled, and that their country can win the battle against COVID-19. Also, the majority of Turkish and Malaysian participants stated that they had not gone to a crowded place, and more than half of them had worn a mask when leaving home. Even though the findings show that participants had good knowledge, attitudes and practices, they have not been good enough to prevent and control the COVID-19 pandemic. Misconceptions about COVİD-19 should be corrected through health education and promotion in both countries. Health promotion and education play very important roles to increase the public's awareness of COVID-19. Health promotion and education can be done via TV, radio and more in social media as it has been very common among people from different age group in both countries. If necessary, authorities in both countries can impose stricter rules and regulations to prevent and control the virus.

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