Knowledge, Attitudes, Practices, and Online Distance Learning Experience of Malaysian University Students towards COVID-19: A Cross Sectional Study (Conference Paper)

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Abstract

Some new norms need to be adapted due to COVID-19 pandemic period where people need to wear masks, wash their hands frequently, maintain social distancing, and avoid going out unless necessary. Therefore, educational institutions were closed to minimize the spread of COVID-19. As a result of this, online education was adapted to substitute face-to-face learning. Therefore, this study aimed to assess the Malaysian university students' adaptation to the new norms, knowledge and practices toward COVID-19, besides, their attitudes toward online learning. This study was conducted from January to February 2021 and included a sample of 500 Malaysian university students. For data collection, all students were asked to fill in a questionnaire that was developed based on previous literature, using Google Forms. 498 students completed the questionnaire (response rate 99.6%). Malaysian Ministry of Health was the main source (83.73%) that students refer to when looking for information on COVID-19. Only 40% of the participants had good overall knowledge about COVID-19; such knowledge was influenced by the students' field of study. The current practice towards COVID-19 was good only by 26.1% of participating students; such practice was influenced by the ethnic groups. Additionally, 60% of participated students agreed that COVID-19 can be successfully controlled. About one-third of participants had positive attitudes toward online learning. The major challenges facing students during online learning include distraction of the learning environment (80%), unstable internet connectivity (75%), lack of motivation (70%), limited technical skills (41%), and limited broadband data (34%). In conclusion, the knowledge and practice toward COVID-19 was good in less than half of Malaysian university students. Attitudes to the controlling of COVID-19 were positive, while the attitudes toward online learning were neutral among most of the Malaysian university students. Challenges toward online learning are diverse and include both technical and student-related problems.
Keywords: COVID-19; Distance learning; University students.

المعرفة والمواقف والممارسات وتجربة التعلم عن بعد عبر الإنترنت لطلاب الجامعات الماليزية تجاه كوفيد-١٩ : دراسة مقطعية (بحث مؤتمر)#

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الخلاصة

بسبب جائحة كورونا يجب الالتزام ببعض المعايير الجديدة كإرتداء ألكمامات، وغسل اليدين بشكل متكرر، والحفاظ على التباعد الاجتماعي، وتجنب الخروج من المنزل ما لم يكن ذلك ضروريًا. لذلك، تم إغلاق المؤسسات التعليمية لتقليل انتشار كوفيد-١٩. نتيجة لذلك، تم الاعتماد على التعليم عبر الإنترنت ليحل محل نظام التعلم الحضوري (وجهًا لوجه). هدفت هذه الدراسة إلى تقييم تكيف طلاب الجامعات الماليزية مع المعايير والمعارف والممارسات الجديدة تجاه كوفيد-١٩، إلى جانب مواقفهم تجاه التعلم عبر الإنترنت. تم استخدام نظام العينة الملائمة لأخذ العينات من ٥٠٠ طالب جامعي ماليزي خلال الفترة من كانون الثاني ولغاية شباط ٢٠٢١ عبر وسائل التواصل الاجتماعي. لجمع البيانات، طُلب من جميع الطلاب ملء استبيان تم تطويره بناءً على الأدبيات السابقة، باستخدام نماذج كوكل. اشات النتائج الى أكمل ٤٩٨ طالبًا الاستبيان (معدل الاستجابة ٩٩,٦٪). كانت وزارة الصحة الماليزية المصدر الرئيسي (٨٣,٧٣٪) الذي يشير إليه الطلاب عند البحث عن معلومات حول كوفيد-١٩. ٤٠٪ فقط من المشاركين لديهم معرفة عامة جيدة عن كوفيد-١٩؛ تأثرت هذه المعرفة بمجال دراسة الطلاب. كانت الممارسة الحالية تجاه كوفيد-١٩ جيدة فقط بنسبة ٢٦,١ ٪ من الطلاب المشاركين؛ تأثرت هذه الممارسة بالمجموعات العرقية. بالإضافة إلى ذلك، وافق ٦٠٪ من الطلاب المشاركين على إمكانية السيطرة على كوفيد-١٩ بنجاح. كان لدى حوالي ثلث المشاركين مواقف إيجابية تجاه التعلم عبر الإنترنت. تشمل التحديات الرئيسية التي تواجه الطلاب أثناء التعلم عبر الإنترنت إلهاء بيئة التعلم (٨٠٪)، والاتصال غير المستقر بالإنترنت (٧٥٪)، ونقص الحافز (٧٠٪)، ومحدودية المهارات التقنية (٤١٪)، ومحدودية الانترنيت (٣٤٪). نستنتج من ذلك إن المعرفة والممارسة تجاه كوفيد-١٩ جيدة لدى أقل من نصف طلاب الجامعات الماليزية. كانت المواقف تجاه السيطرة على جائحة كورونا إيجابية، بينما كانت المواقف تجاه التعلم عبر الإنترنت محايدة بين معظم طلاب الجامعات الماليزيين. التحديات التي تواجه التعلم عبر الإنترنت متنوعة وتشمل المشاكل التقنية وتلك المتعلقة بالطلاب.

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Introduction

In an effort to mitigate the outbreak of COVID-19, many countries including Malaysia, have imposed drastic lockdown, movement control, or shelter in place orders on their residents. Some new norms need to be adapted due to COVID-19 pandemic period where people need to wear masks, wash their hands with soap or hand sanitizer frequently, maintain social distance with others, and avoid going out unless to buy the necessities [1]. However, the effectiveness of these mitigation measures is highly dependent on the cooperation and compliance of all members of society [2].

Due to COVID-19 pandemic and to minimize its spread, there is a need to close educational institutions like universities, schools, tuition centres, and nurseries [3]. Students ranging from primary to tertiary level cannot go back to their respective educational institutions to learn as they usually did. As a result of this, the education system and learning methods have been reshaped. The method of having online learning with technologies and devices as a mediator of communication in order to substitute the physical face-to-face learning has been adapted by most Malaysian education sectors [4]. This is currently the most popular and effective way to continue the learning and teaching process and at the same time stop the spread of COVID-19. The platforms used for online classes include Google Meet, Zoom, Microsoft Teams, and free conference call. In addition, university students also sit for their examinations online and submit their answers via the university's designated platform. Despite the pros of this new teaching and learning method, it has its cons as it may affect all walks of life, especially the students and educators [5].

There were a few studies conducted in Malaysia to assess the knowledge, attitudes, and practices among the Malaysian general public towards COVID-19 [2, 6]. However, to the best of our knowledge, no study was conducted among university students. The knowledge, attitudes, and practices among university students toward the disease play an integral role in determining a society's readiness to accept behavioural change measures from health authorities. Besides, observance of students to the prevention measures is essential for controlling the spread of COVID19 in universities where most students are staying in dormitories or hostels. Therefore, the aim of this study is to assess Malaysian university students' adaptation to the new norms, knowledge levels, attitudes, and practices toward COVID-19, besides their attitudes toward online learning.

Methods

Study design and sampling method

A cross sectional study was conducted from January to February 2021. Although random samples produce more informative and less biased results than convenient ones, COVID-19 may call for desperate actions and serves as an excuse for using less stringent criteria in choosing survey samples [7]. Therefore, a non-probability convenience sampling technique was used to recruit Malaysian university students in this study. University students from all over Malaysia were approached to participate in the study. Due to COVID-19, data were collected only using Google Forms. Social media such as WhatsApp, Facebook, Instagram, and Twitter were used to disseminate and promote the survey to university students. The inclusion criteria of this study were Malaysian university students, aged 18 years old and above from both genders who were able to read and understand English. Study ethical approval was obtained from the institutional human ethics committee at the Universiti Sains Malaysia with the number 20120638 at 11th January 2021. Written informed consent was taken from the participants prior to data collection.

Sample size estimation

The sample size was calculated according to a 95% confidence level, 80% power of the study (1- β) and 5% margin of error (α value or type I error). According to the free online Raosoft sample size calculator, the required sample size was 384. In case of missing data, an additional 30% was added and the required sample size became 500.

Research instruments

The research questionnaire was adapted from the previous studies [2, 6]. The questionnaire consists of six sections. Section A is comprised of demographic information. Section B is to ascertain the respondents' online distance learning experience. Section C is to assess respondents' knowledge and understanding of COVID-19. Scoring of 12 points or less was considered as poor knowledge about COVID-19, while scores more than 12 was considered as good knowledge. Attitude and practice towards COVID-19 are assessed in sections D and E. Scoring of 5 points or less was considered as poor practice, while a score of more than 5 was considered as a good practice. Attitudes towards online learning and challenges of online learning can be found in section F.

Data analysis

Data were entered and analysed with SPSS version 26. Descriptive statistics were used to summarize the socio-demographic characteristics of the subjects. Categorical data was presented as percentages, while continuous data was presented as mean ± standard deviation. Median of knowledge and practice scores was used as a cut-off point to discriminate between good and poor knowledge and practice, respectively [8]. Chi square test was used to assess the difference between categorical variables. P values less than 0.05 were considered significant.

Results

Only 498 students completed the questionnaire (response rate 99.6%). The average age of participants was 19.62 years. Most participants were females (80.92%), with Malay ethnicity (59.04%), living in the central region of Malaysia (28.11%), and studying sciences (46.59%) online in their parent's house (90.96%). Malaysian Ministry of Health (MOH) was the main source (83.73%) that students refer to when looking for information on COVID-19. On the other hand, social media such as Instagram, Facebook, Twitter, and TV were the main media that students use to look for information about COVID-19. Further details are given in Table 1.

Table 2 showed the participants' knowledge about COVID-19. Participants' knowledge about seriousness, transmission, symptoms, and treatment of COVID-19 was good in 95.58%, 78.92%, 89.76%, 85.14% of the participants, respectively. Only 40% of the participants had good overall knowledge about COVID-19. The mean knowledge score was 11.82 ± 1.98.

Regarding the practices toward COVID-19, about 70% of the participated students adhered to COVID-19 protective measures (avoidance of crowded places, wearing face masks, and proper hand hygiene) in the week before the movement control order (MCO) had been started; thereafter, such practices were adopted by about 95% of participated students. On the other hand, the current practice towards COVID-19 was good only by 26.1% of participating students. Further details are shown in Table 3.

Table 4 showed that knowledge about COVID-19 was influenced only by the student's field of study, whereas the practice was influenced by the ethnic groups, in which Indian students had better practice than students from other ethnic groups.

Regarding the attitudes toward COVID-19, Table 5 showed that about 60% of the respondents agreed that COVID-19 can be successfully controlled. Additionally, only a minority (4.4%) of students disagreed with the ability of Malaysia to win the battle against COVID-19. Furthermore, more than half of participating students trusted the ability of the Malaysian government to handle the COVID-19 health crisis in a good way. On the other hand, most study participants agreed on the effect of COVID-19 on national security (72%) and on personal daily life (88%), besides the need of citizen cooperation to overcome such dangerous disease (88%).

Regarding the effectiveness of online learning (Table 6), half of participating students were neutral, one-third had negative attitudes, and one-sixth had positive attitudes toward online learning. More than half of the participants agreed on the benefit of coursemates and teammates while studying online. On the other hand, 45% of students thought the lecturers were helpful for students during the online studying period.

Regarding the challenges in online learning (Figure 1), more than 80% of participating students found the distraction of the learning environment renders focusing during online lectures difficult. On the other hand, as high as about three-fourths of the participants suffered from unstable internet connectivity. Other challenges during online learning included lack of motivation (70%), limited technical skills (41%), and limited broadband data (34%).

Table 1. Demographic data of participants

Parameter		Value
Age mean±SD		19.62±3.33
Gender	Female N(%)	403 (80.92)
	Male N(%)	95 (19.08)
Ethnicity	Malay N(%)	297 (59.64)
	Chinese N(%)	118 (23.69)
	Indian N(%)	46 (9.24)
	Others* N(%)	37 (7.43)
Region**	Central N(%)	140 (28.11)
	East N(%)	108 (21.69)
	North (Penang, Perlis, Perak) N(%)	117 (23.49)
	South (Negeri Sembilan, Melaka, Johor) N(%)	49 (9.84)
	Sabah and Sarawak N(%)	84 (16.87)
Field of study	Medical N(%)	18 (3.61)
	Sciences N(%)	232 (46.59)
	Engineering N(%)	72 (14.46)
	Education N(%)	47 (9.44)
	Business N(%)	36 (7.23)
	Others N(%)	93 (18.67)

Continued table (1)

Parameter		Value
Academic level	1st year N(%)	397 (79.72)
	2nd year N(%)	67 (13.45)
	3rd year N(%)	15 (3.01)
	4th year N(%)	7 (1.41)
	5th year N(%)	4 (0.80)
	Postgraduate N(%)	8 (1.61)
Staying place during online active period	Parent's house N(%)	453 (90.96)
	In campus N(%)	32 (6.43)
	Others (rental house, kampung) N(%)	13 (2.61)
The main SOURCES that students refer to when looking for information on COVID-19	Ministry of Health (MOH) N(%)	417(83.73)
	Majlis Keselamatan Negara (MKN) N(%)	296 (59.44)
	World Health Organization (WHO) N(%)	210 (42.17)
	Family and friends N(%)	159 (31.93)
	Othersˆ N(%)	2 (0.40)
The main MEDIA that students use to look for information on COVID-19	TV N(%)	295 (59.24)
	Online N(%)	291 (58.43)
	Mobile applications# N(%)	286 (57.43)
	Instagram N(%)	229 (45.98)
	Facebook N(%)	209 (41.97)
	Portal N(%)	109 (21.89)
	YouTube N(%)	102 (20.48)
	Twitter N(%)	76 (15.26)
	MySejahtera N(%)	12 (2.41)

*Others: Bumiputra, Siam, Melanau, mixed, Bajau. **Central: Selangor, Kedah, Wilayah Persekutuan; East: Kelantan, Terengganu, Pahang; North: Penang, Perlis, Perak; South: Negeri Sembilan, Melaka, Johor. ^Others: MySejahtera. #Mobile applications: WhatsApp and Telegram.

Table 2. Participants' Knowledge about COVID-19

Question	Good knowledge, n (%)	Poor knowledge, n (%)
Is COVID-19 more critical or severe than normal flu?	476 (95.58)	22 (4.42)
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and body aches.	447 (89.76)	51 (10.24)
Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	218 (43.78)	280 (56.22)
There is currently no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection.	424 (85.14)	74 (14.86)
With immediate treatment, is it possible for person infected with COVID-19 has higher chance for survival?	390 (78.31)	108 (21.69)
Not all persons with COVID-19 will develop to severe cases. Only those who are elderly and/or have chronic illnesses are more likely to have a severe case.	344 (69.08)	154 (30.92)
Eating or touching wild animals would result in the infection by the COVID-19 virus.	217 (43.57)	281 (56.43)
Persons with COVID-19 cannot transmit the virus to others if they do not have a fever.	393 (78.92)	105 (21.08)

Continued table 2.

Question	Good knowledge, n (%)	Poor knowledge, n (%)
The COVID-19 virus spreads via respiratory droplets of infected individuals.	420 (84.34)	78 (15.66)
The COVID-19 virus is airborne.	296 (59.44)	202 (40.56)
Ordinary residents can wear face masks to prevent the infection by the COVID-19 virus.	450 (90.36)	48 (9.64)
It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	403 (80.92)	95 (19.08)
To prevent the infection by COVID-19, individuals should avoid going to crowded places and avoid taking public transportations.	474 (95.18)	24 (4.82)
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	451 (90.56)	47 (9.44)
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the isolation period is 14 days.	484 (97.19)	14 (2.81)
Overall knowledge Good knowledge >12 points Poor knowledge ≤12	202 (40.56)	296 (59.44)
Overall knowledge score Mean ± SD (median)	11.82 ± 1.98	

*Good Knowledge was defined as Knowledge score >12, whereas poor knowledge was defined as knowledge score ≤12.

Table 3. Participant's practice towards COVID-19

Practice		Good practice, n (%)	Poor practice, n (%)
Practice in the week before the movement control order (MCO) had been started	Did you avoid going to crowded places such as weddings?	361 (72.49)	137 (27.51)
	Did you wear a face mask when leaving home?	329 (66.06)	169 (33.94)
	Did you practice proper hand hygiene by frequently washing your hands & using hand sanitizer?	373 (74.90)	125 (25.10)
Current practice	Do you avoid going to crowded places such as weddings?	471 (94.58)	27 (5.42)
	Do you wear a face mask when leaving home?	492 (98.8)	6 (1.20)
	Do you practice hand hygiene by frequently washing your hands & using hand sanitizer?	474 (95.18)	24 (4.82)
	I put a distance from people suspected with COVID-19 only.	302 (60.64)	196 (39.36)
	I limit my movement and not going out except for important business.	467 (93.78)	31 (6.22)
	Do you keep yourself updated about covid-19 cases every day?	259 (52.01)	239 (47.99)
	Overall current practice Good practice > 5points Poor practice ≤ 5 points	130 (26.1)	368 (73.9)
	Overall practice mean ± SD	4.95 ± 0.87	

*Good practice was defined as practice score >5, whereas poor practice was defined as practice score ≤5.

Table 4. The effect of different demographic data on students' knowledge and practice about COVID-19

Demographic		No. of participants	Knowledge				Practice			
			Knowledge Score mean ± SD	Good (>12) N (%)	Poor (12 or less) N (%)	P value	Practice Score mean ± SD	Good (>5) N (%)	Poor (≤5) N (%)	P value
Gender	Male	95	11.69±2.01	35 (36.84)	60 (63.16)	0.411	4.78±0.97	18	77	0.077
	Female	403	11.85±1.98	167 (41.44)	236 (58.56)		4.99±0.84	112	291	
Ethnicity	Malay	297	11.93±1.70	119 (40.07)	178 (59.93)	0.391	5.0±0.83	82	215	**0.002**
	Chinese	118	11.71±2.37	50 (42.37)	68 (57.63)		4.73±0.96	18	100	
	Indian	46	11.91±2.22	22 (47.83)	24 (52.17)		5.15±0.89	20	26	
	Others	37	11.22±2.36	11 (29.73)	26 (70.27)		5.0±0.75	10	27	
Study field	Medical	18	12.22±1.70	9 (50)	9 (50)	**0.001**	4.83±0.71	3	15	0.519
	Sciences	232	12.28±1.65	116 (50)	116 (50)		4.96±0.89	62	170	
	Engineering	72	11.39±2.15	20 (27.78)	52 (72.22)		4.82±1.01	18	54	
	Education	47	10.96±2.24	13 (27.66)	34 (72.34)		4.91±0.75	9	38	
	Business	36	11.39±2.21	10 (27.78)	26 (72.22)		4.94±0.79	8	28	
	Others	93	11.56±2.17	34 (36.56)	59 (63.44)		5.08±0.84	30	63	
Source of information	1 source	101	11.39±2.36	36 (34.65)	65 (63.35)	0.484	4.93±0.89	27	74	0.742
	2 sources	204	11.94±1.70	80 (39.22)	124 (60.78)		5.0±0.85	55	149	
	3 sources	142	11.92±2.11	63 (44.37)	79 (55.63)		4.92±0.93	38	104	
	4 sources	51	11.98±1.79	23 (45.1)	28 (54.9)		4.84±0.78	10	41	
Region of residency	North	117	11.70±2.15	46 (39.32)	71 (60.68)	0.796	4.97±0.92	33	84	0.967
	East	108	12.06±1.59	46 (42.59)	62 (57.41)		4.94±0.83	26	82	
	Central	140	12.03±1.75	61 (43.57)	79 (56.43)		4.99±0.82	37	103	
	South	49	12.02±1.39	19 (38.78)	30 (61.22)		5.0±0.79	13	36	
	Sabah & Sarawak	84	11.24±2.65	30 (35.71)	54 (64.29)		4.83±0.98	21	63	

Table 5. Attitudes and perceptions of the participated students toward COVID-19

Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Do you agree that COVID-19 will be successfully controlled?	68 (13.65)	227 (45.58)	175 (35.14)	23 (4.62)	5 (1.00)
Do you agree that Malaysia can win the battle against the COVID-19 virus?	123 (24.70)	230 (46.18)	123 (24.70)	16 (3.21)	6 (1.20)
The government of Malaysia is handling the COVID-19 health crisis very well.	88 (17.67)	180 (36.14)	170 (34.14)	45 (9.04)	15 (3.01)
COVID-19 outbreak is difficult for me to handle.	44 (8.84)	190 (38.15)	215 (43.17)	42 (8.43)	7 (1.41)
COVID-19 outbreak needs my cooperation as a citizen to overcome it.	259 (52.01)	180 (36.14)	52 (10.44)	3 (0.60)	4 (0.80)
COVID-19 outbreak can threaten national security.	128 (25.7)	232 (46.59)	121 (24.30)	12 (2.41)	5 (1.00)
COVID-19 outbreak can affect the comfort of daily life.	271 (54.42)	169 (33.94)	51 (10.24)	4 (0.80)	3 (0.60)

Table 6. Attitudes and perceptions of students toward learning during COVID-19

| Question	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Do you agree that online learning is effective to you?	15 (3.01%)	69 (13.86%)	249 (50%)	132 (26.51%)	33 (6.63%)
Do you agree that your lecturers are helpful while you are studying online?	59 (11.85%)	165 (33.13%)	205 (41.16%)	54 (10.84%)	15 (3.01%)
Do you agree that your coursemates are helpful while studying online?	97 (19.48%)	187 (37.55%)	152 (30.52%)	42 (8.43%)	20 (4.02%)
Do you agree that your teammates are helpful while working on project online?	74 (14.86%)	193 (38.76%)	149 (29.92%)	55 (11.04%)	18 (3.61%)
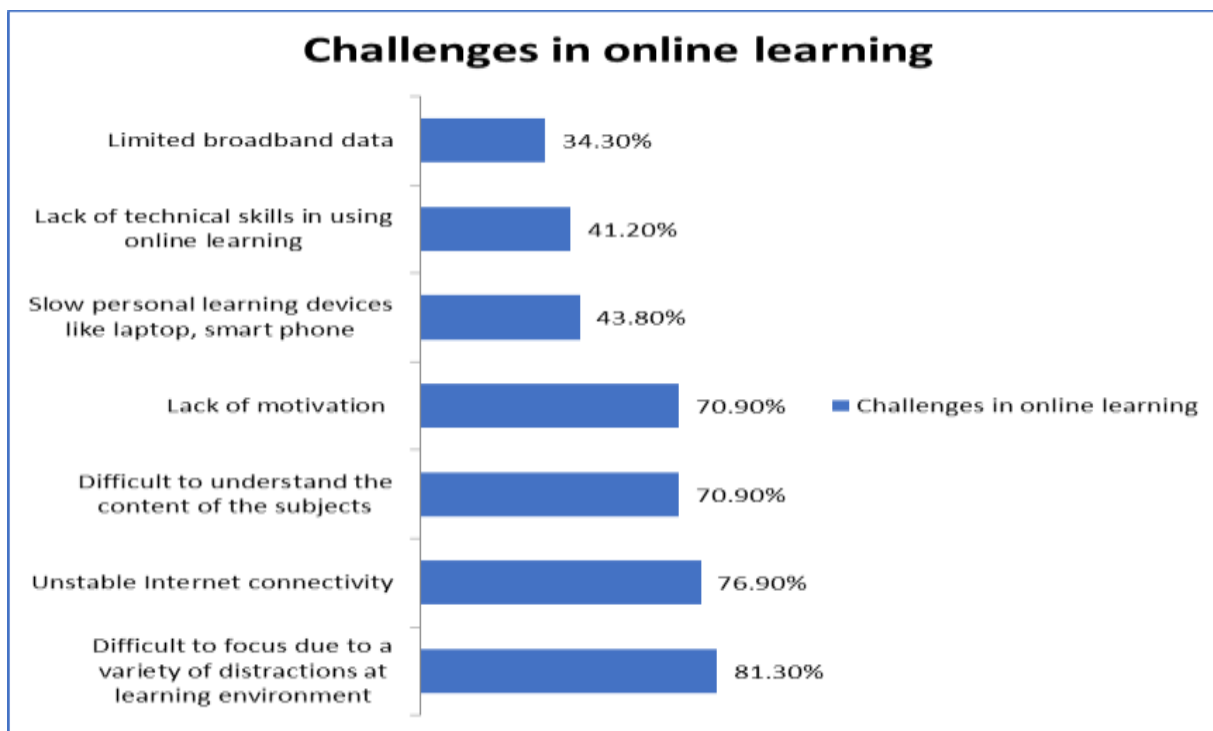
Figure 1. Challenges faced by students in online learning

Discussion

The results of the current study showed that most Malaysian students relied on the Ministry of Health to get the recent information about COVID-19. Meanwhile, most students also obtained such information through searching social media like Facebook, Instagram, and Twitter. This finding was similar to that obtained among people living in Mosul, Iraq [9]. This may be because of increased popularity and easy access to social media, especially among young people [10].

Regarding knowledge about COVID-19, more than 95% of participants realized the seriousness of COVID-19 and protection methods from it. A similar result was also found among Pakistani individuals [11]. The good knowledge of Malaysian students about the seriousness of COVID-19 and its protection methods was mainly attributed to the frequent awareness programs adopted by universities and Malaysian MOH [12]. Despite this good knowledge about some COVID-19 related topics, the overall knowledge about COVID-19 was good only among 40% of Malaysian universities students. This poor knowledge may have resulted from the presence of a huge amount of information in social media and internet websites, most of which were inaccurate and/or false [13, 14]. The overload of information may have caused confusion and difficulty in ascertaining the correct information. This explanation is further confirmed by the result of the current study that showed the knowledge about COVID-19 was influenced only by the students' field of study regardless of students' gender, age, or ethnicity. In this regard, students of the medical and scientific field had the highest knowledge scores due to the nature of their study, which enable them to recognize the accurate information about COVID-19.

The present study showed that the average knowledge score among the participated Malaysian university students was 11.82 ± 1.98. This score was close to that among the Malaysian general public [2]. This finding is somewhat less than expected because of a good educational level among university students as compared to the general population. However, it was found that knowledge score was not correlated with the individual's educational level, instead, it was directly correlated with the individual's risk perception of contraction and complications from the COVID-19; such perception was found to be higher among individuals older than 50 years [15].

The results of the present study showed a positive effect of the movement control order (MCO) in Malaysia to increase university students' adherence to COVID-19 protective measures (avoidance of crowded places, wearing face masks, and proper hand hygiene). This result was consistent with that found in other studies conducted in Malaysia [16, 17].

The current practice to reduce the risk of COVID-19 was good only in 26.1% of participating university students. This level of practice was close to that found in Ethiopia [18] but much less than that in China [19]. This variation in practice may be related to the differences in governmental strategies that influence the COVID-19 prevention practice and the desire of individuals to adhere to such practices. Furthermore, the present study showed that ethnicity had a significant effect on the students' practice of COVID-19 preventive measures. In this regard, university students from Indian ethnicity were more adhere to COVID-19 preventive measures. The higher knowledge about COVID-19 among Indian students than students from other ethnic groups [20] may be the main reason for such better adherence to COVID-19 preventive practices [21].

The results of this study showed positive attitudes of most participating university students toward the ability of the Malaysian government to win the battle against COVID-19 and handle the health crisis in a good manner. These positive attitudes were also detected among the Malaysian general public [2]. On the other hand, most participants agreed on the threat of COVID-19 on national security. Similar attitudes toward pandemic influenza were detected by lay participants in France [22]. Additionally, participants of the present study felt that COVID-19 strongly affect their daily life, such perception was similar to that found in studies conducted in many other countries [23-25]. This perception is highly expected because of the necessity for travel restriction, social distancing, and closure of many facilities except primary and essential services [26].

The present study showed that half of the participants had neutral attitudes toward the effectiveness of online learning. This finding was not surprising since online learning is a new mode of learning in most developing countries [27]. On the other hand, most participating university students agreed on the great help from coursemates and teammates while studying online. This type of cooperation between students is reasonable because electronic learning methods provide tools that help in building online communities for students and also facilitate collaboration between students [28]. Despite this advantage for electronic online learning, the present study showed many problems with such mode of learning including device and student-related problems. The device-related problems include limited broadband data, slow devices (e.g. laptop or smartphone), and unstable internet connectivity. These problems are common in other developing countries and may result from the limited infrastructure for online learning [29, 30]. Meanwhile, student-related problems for online learning are diverse and include lack of technical skills, lack of motivation during online lectures, difficulty in understanding the subject contents, and learning environment that render focusing to lecture

difficult. Most of these problems are linked to the absence of face-to-face contact during the online lectures [31]; thus, such problems can be partly solved by interactive mode of online learning [32].

In conclusion, the knowledge and practice toward COVID-19 was good in less than half of Malaysian university students. Attitudes about the controlling of COVID-19 were positive, while the attitudes toward online learning were neutral among most Malaysian university students. Challenges toward online learning are diverse and include both technical and student-related problems.

Conflict of Interest

Funding

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