

Assessment of Digital Health Literacy and Its Associated Factors Among University Students During Covid-19 Pandemic in Malaysia

ABSTRACT

Background and Objectives: With digital communication technologies such as the internet, and social media platforms, COVID-19 infodemic spreads faster than the coronavirus itself, hence, interfering with national public health containment strategies and government health communication. The objective of this research was to assess digital health literacy and its associated factors among university students during the COVID-19 Pandemic in Malaysia, 2021.

Materials and methods: A total of 1532 Malaysian students participated in this cross-sectional web-based survey. A standardized questionnaire was created using Google Form, and the link was shared via different social media platforms such as Instagram, Facebook, Twitter, and WhatsApp. Chi-Square Test was used to assess the level of Digital Health Literacy, and web-based information seeking among university students.

Results: Among 1532 adult respondents in this study, we found that 42% of the people had difficulties to assess the reliability of health-related information and 42.2% had the ability to decide whether the information provided was written with commercial interest. In addition, sociodemographic variables: age of respondents, gender, race, residents, occupational status, educational status, marital status, family income and employment status were significantly associated with the level of digital health literacy during the COVID-19 pandemic with p-value of less than 0.05 by using Chi-square test.

Conclusion: Though digital health literacy is well established among university students; a significant number of students still face difficulties with certain abilities to evaluate information. Digital health literacy needs to be strengthened among university students in order to improve the quality of health-related information on the internet.

Paper Type: Research Article

Keywords: Digital health literacy; Infodemic; Health information; COVID-19; Malaysian students

► **Citation:** Kyaw T.M, Deng A.G, A/P Mano Mohen Sh, A/P Uvaraja V.M, Mustafa M. Assessment of Digital Health Literacy and Its Associated Factors Among University Students During Covid-19 Pandemic in Malaysia . *Journal of Health Literacy*. Autumn 2022; 3(7): 9-27.

Thin Mon Kyaw

* Lecturer, Department of Community Medicine, Faculty of Medicine, University of Cyberjaya, Malaysia. (Corresponding author): dr.sofi8655@gmail.com

Achol Geng Deng

Department of Community Medicine, Faculty of Medicine, University of Cyberjaya, Malaysia.

hubaniya A/P Mano Mohen

Department of Community Medicine, Faculty of Medicine, University of Cyberjaya, Malaysia.

Vaishnavi Devi A/P Uvaraja

Department of Community Medicine, Faculty of Medicine, University of Cyberjaya, Malaysia.

Syed Mohammad Mustafa

Department of Community Medicine, Faculty of Medicine, University of Cyberjaya, Malaysia.

Received: 27 May 2022

Accepted: 11 August 2022

Doi: 10.22038/jhl.2022.66386.1318

Introduction

The new COVID-19 pandemic is an ongoing global crisis caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which was declared a pandemic on March 11, 2020 by the World Health Organization (1). Malaysia like other countries went for a nationwide lockdown strategy called “Movement Control Order” to avoid a viral outbreak(2). Collectively, the Malaysian Ministry of Health (MMoH) disseminates information about COVID-19 cases through its official websites such as “Kementerian Kesihatan Malaysia, My sejahtera” since it was much easier to spread information intended for the general public (3). The advent of the internet allows information to be disseminated on a large scale. Thus, it was common for public health providers to use their official websites to educate and update the public on the current state of COVID-19(3). The communication strategy includes public broadcasting agencies, which launched web-based media campaigns, such as daily nationwide podcasts. This was to ensure that the citizens get the necessary information on COVID-19 and how it affects people’s health (4). Moreover, this pandemic is clearly accompanied by an “infodemic” with valid and invalid health information related to COVID-19.4 Furthermore, the studies also found some evidences on parents’ low literacy level can be impacted on their child’s health outcomes (e.g., depressive symptoms, persistent asthma). According to previous literatures, there were factors that influenced an individual's digital health literacy, including living in poverty, education, race/ethnicity, age, and disability (5,6).

However, with digital communication technologies, such as the internet, and social media platforms, COVID-19 infodemic spreads faster than the coronavirus itself, hence, interfering with national public health containment strategies

and government health communication(5). It has been reported that, a lot of people are limited with health literacy, and therefore, it was difficult to deal with health-related information (5). There were also difficulties in assessing reliable information on media for cases related to COVID-19 and its associated health problems. People with limited health literacy are more likely to be confused due to the large amount of information available in the media and on the internet. Therefore, digital health literacy is important during this pandemic (5). Students who used web-based sources on topics in connection with COVID-19 shows that, there were difficulties faced by many in assessing reliable sources of health-related information and the ability to determine whether the information was written with a commercial interest or not (6,7). Most frequently, many people found that when there was stratification based on sociodemographic characteristics, it was difficult in finding the information they are looking for.8 In addition to that, many people with limited health literacy are more vulnerable to COVID-19 infection to have higher fear (7).

Therefore, the aim of our study was to study the effects of Digital Health Literacy and associated factors among university students during the COVID-19 pandemic in Malaysia.

Methods

Study design and setting

A cross-sectional study was distributed on the online platform using Google Form to access the Digital Health Literacy and Web-Based Information Seeking Behavior among university students during the COVID-19 pandemic using the Digital Health Literacy Instrument (DHLI) (5,8). Our target population were all Malaysian university students residing in Malaysia regardless of socio-demographic backgrounds. These includes, those

who are (1) 18 years old and above; (2) Malaysian students residing in Malaysia at the time of this survey, and obtained post-secondary and tertiary education; (3) digitally literate students, and (4) those who were willing to participate.

Study instrument

The DHLI was adapted to the context of the COVID-19 vaccine, for instance, “When you search the internet for information on the COVID-19 vaccine, how easy or difficult is it for you?”. The four subscales include (i) searching the web for information on COVID-19 vaccine (3 questions); (ii) adding self-generated content on the COVID-19 vaccine (3 questions); (iii) evaluating the reliability of the COVID-19 vaccine (3 questions), and (iv) determining personal relevance of COVID-19 vaccine (3 questions). This comprises of 12 questions and participants were required to choose a score on each question from the survey, which scores as “1” for “very difficult” to “4” for “very easy” (8).

The online information-seeking behaviour component comprises of 3 items. The respondents were presented with 8 items with a list of different web-based sources such as, search engines, websites of public health bodies and government agencies. The frequency could be rated on a 5-point scale “0, don't know; 4, often’ (Marstedt G, 2018). Questions regarding social media were asked in a separate section to determine the most preferred social media platform to access COVID-19 vaccine information. Participants were also asked to indicate the specific topics they searched for in the context of the COVID-19 vaccine. The assessment was based on a self-developed list of 10 topics, by choosing multiple responses (5,9).

We run the pilot test to validate the questionnaires using in our study and the Cronbach’s alpha of internal consistency was reported to be 0.86, and test-retest reliability

during a short retest interval was 0.8. Therefore, the questionnaires we used in our study were acceptable with good validity and reliability.

Sample size calculation and data collection

With the use of Raosoft 2004 software, a sample size estimated to be 385 with a confidence level of 95%, a margin of error of 5%, and a response distribution of 50%. By taking into consideration of 20% attrition rate, the minimum sample size required in this study was 462 with a population size of 21.8 million among Malaysian university students. The online survey was actively dispatched through online platform and social media such as WhatsApp, Facebook, and Twitter. The Google Form link was attached with informed consent question which was automatically directed to the details of our objectives, backgrounds, study, introduction and the nature of the study via respective social media platforms (10).

For our online survey to gain the consent of participants, we included a section after they read all the details of our research. For those who neglect to give consent, the online survey is considered invalid. To prevent the overlapping of participants especially those who might answer more than one time, we asked the participants to screenshot the form they did and report what time they did the online survey once they are done with our online survey.

Ethical Approval

All the participants were provided with informed consent before the commencement of the survey. The ethical approval was acquired from Human Research Ethics Committee, Centre of Research and Development, Asia Metropolitan University (No. AMU-CRD-FRM006; REV: 00), which is in accordance with the Declaration of Helsinki. We prioritized the informed consent section right after the details of our research and before the questionnaire part starts. Anonymity

and privacy of participants were given utmost importance without asking for participants' personal information (11,12)

Statistical Analysis

A total number of 1532 eligible participants were considered in analyzing the data. Data analysis was conducted utilizing the Statistical Package for the Social Sciences (SPSS) software. A bivariate analysis was conducted by cross-tabulating the two levels of digital health literacy "limited vs sufficient" with sociodemographic characteristics using the Chi-square test. For this purpose, all DHLI subscales were dichotomized using median splits. Due to low internal consistency for the dimension "protecting privacy" and the fact that, two subscales from the original DHLI instrument were not used. We also refrained from calculating

an overall mean value (8). For all the analysis, P values below 0.05 were considered statistically significant. However, due to the large sample size, the strength of the association was determined using the Cramer index (13).

Results

Table 1 shows the summary statistics of the socio-demographic profile of the study participants. Results show about 90% of the individuals were aged between 21 to 25 years old. More than 50% of the individuals were males (50.3%) and the rest were females. Majority of the individuals live in urban areas, (80.9%). Almost half of the individuals were Malays (52.7%). About 75% of the individuals were single (77.3%) and more than half of them were students, (55.6%).

Table 1. Sociodemographic Characteristics of the participants (N=1532)

Variables		Frequency	Percentage (%)
Age (mean± SD)		27.79 (±10.91)	
Residence	Rural	293	19.1
	Urban	1239	80.9
Gender	Female	762	49.7
	Male	770	50.3
Marital status	Divorced	26	1.7
	Married	297	19.4
	Single	1184	77.3
	Widowed	19	1.2
	Others	6	0.4
Race	Chinese	311	20.3
	Indian	289	18.9
	Malay	808	52.7
	Others	124	8.1
Religion	Agnostic	1	0.1
	Buddhism	219	14.3
	Christianity	167	10.9
	Hinduism	234	15.3
	Islam	836	54.6
	None	1	0.1
	Others	11	0.7
Family Income	Less than RM4849	626	40.9
	Between RM4850-10960	730	47.7
	More than RM10960	176	11.5

Educational status	No formal education	25	1.6
	Primary	58	3.8
	Secondary	134	8.7
	Post-secondary education	503	32.8
	Tertiary	812	53.0
Employment status	Employed (full time)	393	25.7
	Employed (part time)	93	6.1
	Housewife	2	0.2
	Looking for jobs	37	2.4
	Retired	24	1.6
	Self employed	1	0.1
	Student	852	55.6
	Student (with employment)	1	0.1
	Unemployed	45	2.9
	Others	19	1.2

In supplementary table-1, 88.4% of the participants were not permanently impaired by a health problem, 85.6% were not impaired by chronic illnesses and 94.3% had a long-lasting health problem. When searching the internet for information on COVID-19 vaccine, majority of the participants (45.6%) have had always find it easy in making a choice from all the searched information. Apart from that, many (55.2%) find it easy to use the proper words to look for the related information. 50% of the population agreed that it has been easy to look for the exact information whereas about 42% have said that, it was easy to decide the reliability of the searched

information and whether it was written with commercial interests. Majority (96.5%) of the individuals were using social medias. More than 45% of the population finds it easy to formulate their health-related worry (45.7%), to express their opinions in writing (47.6%) whereas 45.2% of the individuals had difficulty in making the others understand what they exactly mean when writing messages. Furthermore, 49.7% preferred using English language for searching information about COVID-19 vaccine and relevant topics and 47.4% of the population were satisfied with the searched information.

Supplementary table 1: Assessment for the level of Digital Health Literacy among participants (N=1532)

Variables		(N=1532)	Percentage
Are you permanently impaired by a health problem in activities of normal everyday life?	No	1355	88.4
	Yes	108	7.0
To what extent are you impaired by your chronic illness in activities of normal everyday life?	Mildly impaired	100	6.5
	Moderately impaired	44	2.9
	Not impaired	1306	85.6
	Severely impaired	14	0.9
Do you have a chronic disease or a long-lasting health problem? This refers to diseases or health problems that last or are expected to last at least 6 months.	No	1444	94.3
	Yes	88	5.7

How sufficient do you consider the money at your disposal?	Sufficient	180	34.6
	Completely sufficient	226	43.5
	Less sufficient	41	7.9
	Not sufficient	8	1.5
	Other	5	1.0
Please mark the scale where you think you stand at this time in your life relative to other people. The higher up you are on this ladder, the closer you are to the people at the very top; the lower you are, the closer you are to the people at the very bottom. Where would you place yourself on this scale? (1 to 10)		6.99(±1.74)	
1. Have you searched in the internet in the last 4 weeks about COVID-19 vaccine? No, I have not searched any information for myself and other people.		187	12.2
Yes, information for me and other people		814	53.1
Yes, only information for me		421	27.5
Yes, only information for other people		110	7.2
2. When you search the internet for information on the COVID-19 vaccine, how easy or difficult for you to:			
Make a choice from all the information you find?	Very easy	324	21.1
	Easy	698	45.6
	Difficult	455	29.7
	Very difficult	55	3.6
Use the proper words or search query to find the information you are looking for?	Very easy	392	25.6
	Easy	846	55.2
	Difficult	235	15.3
	Very difficult	59	3.9
Find the exact information you are looking for?	Very easy	355	23.2
	Easy	766	50.0
	Difficult	352	23.0
	Very difficult	59	3.9
Decide whether the information is reliable or not?	Very easy	413	27.0
	Easy	643	42.0
	Difficult	391	25.5
	Very difficult	85	5.5
Decide whether the information is written with commercial interests	Very easy	360	23.5
	Easy	647	42.2
	Difficult	442	28.9
	Very difficult	83	5.4
Check different websites to see whether they provide the same information?	Very easy	398	26.0
	Easy	726	47.4
	Difficult	336	21.9
	Very difficult	72	4.7
Decide if the information you found is applicable to you?	Very easy	401	26.2
	Easy	721	47.1
	Difficult	345	22.5
	Very difficult	65	4.2

Apply the information you found in your daily life?	Very easy	406	26.5
	Easy	750	49.0
	Difficult	299	19.5
	Very difficult	77	5.0
Use the information you found to make decisions about your health.	Very easy	477	31.1
	Easy	682	44.5
	Difficult	321	21.0
	Very difficult	52	3.4
3. Are you using social media?	Yes	1479	96.5
	No	53	3.5
4. When typing a message about the COVID-19 vaccine, how easy or difficult is it for you to:			
Clearly formulate your question or health-related worry?	Very easy	305	19.9
	Easy	700	45.7
	Difficult	505	33.0
	Very difficult	22	1.4
Express your opinion, thoughts or feelings in writing?	Very easy	428	27.9
	Easy	729	47.6
	Difficult	319	20.8
	Very difficult	56	3.7
Write your messages as such for people to understand exactly what you mean?	Very easy	423	27.6
	Easy	693	45.2
	Difficult	360	23.5
	Very difficult	56	3.7
5. When you post a message about the COVID-19 vaccine or related topics on a public forum or social media, how often:			
Do you find it difficult to judge who can read along?	Never	440	28.7
	Once	547	35.7
	Several time	495	32.3
	Often	50	3.3
Do you (intentionally or unintentionally) share your own private information (ex: name or address)?	Never	820	53.5
	Once	500	32.6
	Several time	182	11.9
	Often	30	2.0
Do you (intentionally or unintentionally) share someone else's private information?	Never	946	61.7
	Once	423	27.6
	Several time	140	9.1
	Often	23	1.5

6. What language do the sources you use for researching information COVID-19 vaccine and relevant topics have?	Bahasa melayu	550	36.9
	Chinese	151	9.9
	Tamil	39	2.5
	English	762	49.7
	Others	31	2.0
7. Now it's about how important various things are to you when you search the Internet for the COVID-19 vaccine and related topics. How important is it to you that:			
The information is up to date?	Very Important	865	56.5
	Rather important	615	40.1
	Rather not important	48	3.1
	Not at all important	4	0.3
The information is verified?	Very Important	1170	76.4
	Rather important	288	18.8
	Rather not important	54	3.5
	Not at all important	20	1.3
You quickly learn the most important things?	Very Important	921	60.1
	Rather important	504	32.9
	Rather not important	88	5.7
	Not at all important	19	1.2
The information comes from official sources?	Very Important	1119	73.0
	Rather important	337	22.0
	Rather not important	54	3.5
	Not at all important	22	1.4
The different opinions are represented?	Very Important	851	55.5
	Rather important	550	35.9
	Rather not important	94	6.1
	Not at all important	37	2.4
The subject is dealt with comprehensively?	Very Important	1014	66.2
	Rather important	385	25.1
	Rather not important	90	5.9
	Not at all important	43	2.8
8. How satisfied are you with the information you find on the Internet about the COVID-19 vaccine?	Very dissatisfied	50	3.3
	Dissatisfied	113	7.4
	Neutral	726	47.4
	Satisfied	564	36.8
	Very satisfied	79	5.2

According to table-2, the results show that 77.2% of the population said yes that everyone should be vaccinated according to the National Vaccination Schedule. The decision to be vaccinated according to the participants (21.9%) depends on which country the vaccine is being produced and (1.9%) have doubts if the

restriction order will be lifted in case of higher vaccination uptake. 43.5% of the participants preferred to be vaccinated in hospitals, 31.9% in health centers and clinics. However, the majority of the participants (83.2%) claimed to have seen or heard something bad about the vaccines.

Table 2. Vaccine Hesitancy among participants (n=1532)

Variables	Strongly disagree n(%)	Disagree n(%)	Neutral n(%)	Agree n(%)	Strongly agree n(%)
I believe the COVID-19 vaccine can help control the spread of COVID-19.	162 (10.6)	159 (10.4)	488 (31.9)	406 (26.5)	317 (20.7)
If I knew I had been infected with COVID-19 before, I would not get COVID-19 vaccine	369 (24.1)	702 (45.8)	345 (22.5)	103 (6.7)	13 (0.8)
When everyone else is vaccinated against COVID-19, then I don't have to get vaccinated	474 (30.9)	665 (43.4)	285 (18.6)	91 (5.9)	17 (1.1)
Variables	Frequency			Percentage	
Apart from COVID-19, I think everyone should be vaccinated according to the national vaccination schedule.	Yes	1183		77.2	
	No	143	9.3		
	Don't Know	136	13.5		
If a COVID-19 vaccine is made available in my country, my decision of whether or not to get vaccinated would depend on:					
- Country in which the vaccine is produced			335	21.9	
- Recommendation from my family doctor			185	12.1	
-Recommendation of the Ministry of Health			220	14.4	
- Whether the vaccine has been in use for a long time with no serious side-effects			101	6.6	
-Whether the vaccine is used in other countries			150	9.8	
-Risk of getting infected with COVID-19 at the time when the vaccine is available			82	5.4	
-How easy it is to get the vaccine			68	4.4	
-Whether the vaccine is free of charge			69	4.5	
-Whether a high vaccination uptake would lift restrictions on movement and gathering in groups			29	1.9	
-Feedback from the people who get vaccinated.			80	5.2	
-Weather will the government provide me compensation if anything happened after vaccinated			61	4.0	

-Whether getting vaccinated would allow me to safely see family and friends again	67	4.4	
-Whether getting vaccinated would allow me to travel, go to concerts and other social activities again	85	5.5	
	Mean ± SD		
How important do you think getting a COVID-19 vaccine will be for your health?	5.6 ± 1.4		
How concerned are you that a COVID-19 vaccine could cause you to have a serious reaction?	5.0 ± 1.6		
I am completely confident that the COVID-19 vaccine is safe.	4.7 ± 1.4		
Vaccination against COVID-19 is unnecessary because COVID-19 is not common anymore.	3.3 ± 1.7		
Everyday stress prevents me from getting vaccinated against COVID-19.	3.5 ± 1.6		
When I think about getting vaccinated against COVID-19, I weigh benefits and risks to make the best decision possible.	5.1 ± 1.7		
When everyone else is vaccinated against COVID-19, then I don't have to get vaccinated.	3.2 ± 1.9		
Where would you prefer to get a COVID-19 vaccine? Choose as many as apply.	- Hospital	666	43.5
	- Health center/clinic	488	31.9
	- Workplace	21	1.4
	- Pharmacy	324	21.1
	- Community center, meeting hall, or local shop	142	9.3
	- Somewhere else	3	0.2
	- Others	1	0.07
I have seen or heard something bad about COVID-19 vaccines.	- I don't want the vaccine	1	0.07
	Yes	1275	83.2
	No	257	16.8

Among the participants, 31.9% reported that they were neutral about the COVID-19 vaccine can help control the spread of COVID-19. More than 45% of the participants disagreed that they wouldn't get vaccinated if they have been previously infected with COVID-19 (45.8%), and 43.5% disagreed that they don't have to be vaccinated if everyone else is vaccinated.

The web-based information-seeking behavior of the participants is reported in Supplementary Table 3. Results show that, search engines such as "Google, Bing, Yahoo" were used often (68.5%) to

get information about the COVID-19 vaccine. The following platforms were used less frequently: websites of public bodies (67.9%), news portals (66.3%), websites of doctors or health insurance companies (47.1%), online communities (41%) and COVID-19 Hotlines (31.3%). As for the most common social media, Facebook (47.7%) and Twitter (55.4%) were used the most often to obtain information on the vaccine. Others like Instagram, YouTube, WhatsApp and Tik Tok were used sometimes which accounts for less than 50% overall. Certain platforms like Pinterest, Snapchat,

Telegram, Clubhouse, Reddit, and Weixi/WeChat scored the highest in the “never used” category. The majority (51.2%) were interested to know

the vaccine’s adverse effects followed by the new vaccine trials development (20.4%).

Supplementary table 2: Assessment of Web-based information-seeking behaviour among participants (N=1532)

Variables	Often n (%)	Sometimes n (%)	Rarely n (%)	Never n (%)	Don't know n (%)
1. There are various possibilities mentioned on how to get information about the COVID- 19 vaccine from the internet. Please indicate how often you currently use the sources.					
Search Engines (eg: Google, Bing, Yahoo)	356 (68.5)	158 (30.4)	5 (1.0)		1 (0.2)
Websites of public bodies (eg: RKI, BZgA, ministries of health)	353 (67.9)	155 (29.8)	9 (1.7)	2 (0.4)	1 (0.2)
Wikipedia and other web-based encyclopedias	170 (32.7)	295 (56.7)	44 (8.5)	11 (2.1)	-
Blogs on health topics	59 (11.3)	194 (37.3)	59 (11.3)	28 (5.4)	8 (1.5)
Online communities – someone post a query and others respond and give suggestions/solutions (eg. WhatsApp chat, WeChat chat, Telegram)	213 (41.0)	210 (40.4)	56 (10.8)	36 (6.9)	5 (1.0)
COVID-19 Hotlines	163 (31.3)	150 (28.8)	31 (6.0)	81 (15.6)	95 (18.3)
Websites of doctors or health insurance companies	245 (47.1)	221 (42.5)	33 (6.3)	19 (3.7)	2 (0.4)
News portals (eg, newspapers, TV and radio stations)	345 (66.3)	150 (28.8)	15 (2.9)	10 (1.9)	-
2. There are various possibilities mentioned on how to get information about the COVID-19 vaccine from the internet. Please indicate how often you currently use the sources.					
Facebook	248 (47.7)	227 (43.7)	35 (6.7)	8 (1.5)	2 (0.4)
Twitter	288 (55.4)	187 (36.0)	33 (6.3)	12 (2.3)	-
Instagram	210 (40.4)	257 (49.4)	40 (7.7)	11 (2.1)	2 (0.4)
YouTube	189 (36.3)	252 (48.5)	55 (10.6)	20 (3.8)	4 (0.8)
WhatsApp	164 (31.5)	220 (42.3)	116 (22.3)	19 (3.7)	1 (0.2)
TikTok	128 (24.6)	193 (37.1)	118 (22.7)	74 (14.2)	7 (1.3)

Pinterest	62 (11.9)	111 (21.3)	129 (24.8)	211 (40.6)	7 (1.3)
Snapchat	68 (13.1)	114 (21.9)	90 (17.3)	226 (43.5)	22 (4.2)
Telegram	140 (26.9)	93 (17.9)	71 (13.7)	207 (39.8)	9 (1.7)
Clubhouse	29 (5.8)	71 (13.7)	47 (9.0)	202 (38.8)	171 (32.9)
Reddit	26 (5.0)	65 (12.5)	47 (9.0)	193 (37.1)	189 (36.3)
Weixin/WeChat	21 (4.0)	76 (14.6)	47 (9.0)	193 (37.1)	183 (35.2)
3. Please indicate the specific topics you are searching for in the context of the Covid-19 vaccine. (You can select multiple response options if necessary)			Number (n)	Percentage (%)	
Differences between types of Covid 19 vaccine			11	2.1	
Access to Covid 19 vaccine/immunization schedule			28	5.4	
New Covid 19 vaccine trials development			106	20.4	
Covid-19 vaccine adverse/side effects			266	51.2	
Availability of Covid-19 vaccine in my country			31	5.9	
Covid-19 vaccine immunity			21	4.0	
Contents of Covid-19 vaccine			11	2.1	
Covid-19 vaccine efficacy and effectiveness			28	5.4	
Covid-19 vaccine cost			10	1.9	
Covid-19 vaccine development process			8	1.5	

The results from the chi-square analyses for the test of association of socio-demographic factors and Digital health literacy web-based information seeking of participants are presented in Table 3 and Table 4. Among the tested variables of them, age, marital status, race, religion, family income, educational status, employment status, the extent of chronic illness in activities of normal everyday life and presence of chronic disease or a long-lasting health problem which expected to last at least 6 months and sufficiency at disposable income, were significant at a level, p-value, below $p=0.05$.

Young adults who range from 18-35 years old have a better understanding of DHL when

compared to the other age groups. Females are 0.56 times (95% CI: 0.31,0.98) more likely to have a good DHL ability when compared to males. Apart from that, singles, Malays, those who are Islam, those whose family income ranges between RM4850-RM10960, and those pursuing tertiary education and students have better DHL compatibility when compared to their respective categories. Participants that do not have chronic or long-lasting health problems are 0.38 times (95% CI: 0.17,0.86) more than those who suffer from chronic illnesses. Those who considered sufficient of the disposal of their money have better DHL ability when compared to those who feel not sufficient.

Table 3: Association of socio-demographic factors and Digital Health Literacy of participants using Chi-square test (N=1532)

Variables		Number (%)	Wald (df)	p-value
Age	Young adult	1127 (99.6)	40.42(3)	0.001***
	Adult	227(97.1)		
	Middle adult	108 (89.3)		
	Old adult	9 (64.3)		
Residence	Rural	278 (96.2)	0.12 (1)	0.859
	Urban	1193 (96.6)		
Gender	Female	738 (97.5)	4.20 (1)	0.050*
	Male	733 (95.6)		
Marital status	Divorced	23 (88.5)	43.45(4)	0.001***
	Married	277(93.3)		
	Single	1154 (98.0)		
	Widowed	12 (63.2)		
	Others	5 (100)		
Race	Chinese	310 (9.7)	25.09 (3)	0.001***
	Indian	284 (98.3)		
	Malay	764 (95.5)		
	Others	113 (91.1)		
Religion	Agnostic	1 (100)	20.19(7)	0.004*
	Buddhism	218 (99.5)		
	Christianity	161 (96.4)		
	Hinduism	230 (98.3)		
	Islam	792 (95.7)		
	None	1 (100)		
	Others	10 (90.9)		
Family Income	Less than RM4849	600 (96.5)	7.69 (2)	0.019**
	Between RM4850- RM10960	709 (97.4)		
	More than RM10960	162 (93.1)		
Educational status	No formal education	16 (64.0)	43.14 (4)	0.001***
	Primary	55 (94.8)		
	Secondary	117 (92.1)		
	Post-secondary education (Pre- University, Matriculation, A-level, Diploma, Foundation etc.)	492 (98.0)		
	Tertiary (Bachelor, Degree, Master, PhD)	791 (97.4)		

Employment status	Employed (full time)	376 (95.7)	65.17 (11)	0.001***
	Employed (part time)	87 (94.6)		
	Housewife	2 (100)		
	Looking for jobs	34 (94.4)		
	Retired	17 (70.8)		
	Self employed	1 (100)		
	Student	834 (98.6)		
	Student with employment	1 (100)		
	Unemployed	42 (93.3)		
	Others	13 (68.4)		
Are you permanently impaired by a health problem in activities of normal everyday life?	No	1303(96.4)	2.99 (2)	0.217
	Yes	100(95.2)		
To what extent are you impaired by your chronic illness in activities of normal everyday life?	Mildly impaired	96 (96.0)	19.71 (9)	0.053
	Moderately impaired	39 (95.1)		
	Not impaired	1253 (96.6)		
	Severely impaired	10 (76.9)		
Do you have a chronic disease or a long-lasting health problem? This refers to diseases or health problems that last or are expected to last at least 6 months.	No	1391 (96.8)	5.74 (1)	0.017*
	Yes	80 (92.0)		
How sufficient do you consider the money at your disposal?	Sufficient	787 (97.3)	24.64 (6)	0.001***
	Completely sufficient	333 (97.7)		
	Less sufficient	212 (94.6)		
	Not sufficient	59 (85.5)		
	Other	17 (94.4)		

Table 4: Association of socio-demographic factors and web-based information seeking among participants using Chi-square test (N=1524)

Variables	Don't know n(%)	Never n (%)	Often n (%)	Rarely n (%)	Sometimes n (%)	Wald (df)	p-value
Age							
Young adult	25 (11.0)	45 (19.7)	5 (2.2)	110 (48.2)	43 (18.9)	171.4 (15)	0.001***
Adult	303 (26.1)	471(40.6)	47 (4.0)	194 (16.7)	146 (12.6)		
Middle adult	35 (28.9)	47 (38.8)	2 (1.7)	27 (22.3)	10 (8.3)		
Old adult	4 (28.6)	5 (35.7)	0 (0)	4 (28.6)	1 (7.1)		
Residence							
Rural	55 (19.0)	122 (42.2)	18 (6.2)	51 (17.6)	43 (14.9)	17.49 (5)	0.005**
Urban	312 (25.3)	446 (36.1)	36 (2.9)	284 (23.0)	157 (12.7)		
Gender							
Female	173(22.8)	307 (40.6)	19 (2.5)	150 (19.8)	108 (14.3)	14.65 (5)	0.012
Male	194 (17.3)	261 (34.0)	35 (4.6)	185 (24.1)	92 (12.0)		

Marital status							
Divorced	5 (19.2)	11 (42.3)	1(3.8)	6(23.1)	3(11.5)	74.91 (20)	0.001***
Married	71(23.9)	117 (39.4)	7(2.4)	60 (20.2)	42(14.1)		
Single	287 (24.4)	431 (36.6)	46 (3.9)	260 (22.1)	153(13.0)		
Widowed	3(15.8)	8 (42.1)	0 (0.0)	7(36.8)	1(20.0)		
Others	1(20)	1 (20)	0 (0.0)	2 (40.0)	1(5.3)		
Race						230.34 (15)	0.001***
Chinese	46(14.8)	89(28.6)	8(2.6)	131(42.1)	37(11.9)		
Indian	123(42.5)	104(36.0)	10(3.5)	29(10.0)	23(8.0)		
Malay	184(23)	341(42.6)	26(3.3)	157(19.6)	92(11.5)		
Others	14(11.3)	34(27.4)	10(8.1)	18(14.5)	48(38.7)		
Religion						331.67 (35)	0.001***
Agnostic	1(100.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)		
Buddhism	18(8.2)	55(25.1)	9(4.1)	105(47.9)	32(14.6)		
Christianity	17(10.2)	53(31.7)	11(6.6)	42(25.1)	44(26.3)		
Hinduism	97(41.4)	89(38.0)	7(3.0)	24(10.3)	17(7.3)		
Islam	181(21.9)	356(43.0)	26(3.1)	159(19.2)	106(12.8)		
None	0(0.0)	1(100.0)	0(0.0)	0(0.0)	0(0.0)		
Others	3(27.3)	6(54.5)	1(9.1)	1(9.1)	0(0.0)		
Family Income						71.33 (10)	0.001***
Less than RM4849	139(22.3)	276(44.4)	18(2.9)	114(18.3)	75(12.1)		
Between RM4850- RM10960	203(27.9)	226(31.0)	23(3.2)	191(26.2)	85(11.7)		
More than RM10960	25(14.4)	66(37.9)	13(7.5)	30(17.2)	40(23.0)		
Educational status						114.62 (20)	0.001***
No formal education							
Primary	4(16.0)	12(48.0)	1(4.0)	4(16.0)	4(16.0)		
Secondary	7(12.0)	31(53.4)	1(1.7)	13(22.4)	6(10.3)		
Post secondary education (Pre-University, Matriculation, A-level, Diploma, Foundation etc.)	36(28.3) 86(17.1)	46(36.2) 161(32.1)	4(3.1) 12(2.4)	25(19.7) 159(31.7)	16(12.6) 84(16.7)		
Tertiary (Bachelor, Degree, Master, PhD)	234(28.8)	318(39.2)	36(4.4)	134(16.5)	90(11.1)		
Employment status						234.94 (55)	0.001***
Employed (full time)	75(19.1)	181(46.1)	10(2.5)	78(19.8)	49(12.5)		
Employed (part time)	16(17.4)	27(29.3)	5(5.4)	26(28.3)	18(19.6)		
Housewife	0(0.0)	1(100.0)	0(0.0)	0(0.0)	0(0.0)		
Looking for jobs	6(16.6)	17(47.2)	0(0.0)	8(22.2)	5(13.9)		
Retired	6(25.0)	10(41.7)	0(0.0)	6(25.0)	2(8.3)		
Self employed	1(100.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)		
Student	197(22.3)	295(34.9)	33(3.9)	204(24.1)	117(13.8)		
Student with employment	0(0.0)	0(0.0)	0(0.0)	1(100.0)	0(0.0)		
Unemployed	14(31.1)	16(35.6)	1(2.2)	7(15.6)	7(15.6)		
Others	5(26.3)	9(47.4)	1(5.3)	3(15.8)	1(5.3)		

Are you permanently impaired by a health problem in activities of normal everyday life?							
No	290(21.4)	527(39.0)	43(3.2)	303(22.4)	188(13.9)	108.36	0.001***
Yes	29(27.6)	31(29.5)	7(6.7)	26(24.8)	12(11.4)	(10)	
To what extent are you impaired by your chronic illness in activities of normal everyday life?							
Mildly impaired	25(25.0)		5(5.0)	25(25.0)	8(8.0)	151.94 (45)	0.001***
Moderately impaired	11(26.8)		4(9.8)	9(22.0)	7(17.1)		
Not impaired	277(21.4)		40(3.1)	298(23.0)	181(14.0)		
Severely impaired	5(38.5)		1(7.7)	0(0.0)	2(15.4)		
Do you have a chronic disease or a long-lasting health problem? This refers to diseases or health problems that last or are expected to last at least 6 months.							
No	346(24.1)	537(37.4)	49(3.4)	321(22.3)	184(12.8)	13.25	0.016
Yes	21(24.1)	31(35.6)	5(5.7)	14(16.1)	16(18.4)	(5)	
How sufficient do you consider the money at your disposal?							
Sufficient	177(21.8)	300 (37.1)	20(2.5)	194(24.0)	118(14.6)	143.22 (30)	0.001***
Completely sufficient	82(24.0)	15(4.4)	20(5.9)	71(20.8)	39(11.4)		
Less sufficient	43(19.2)	97(43.3)	97(43.3)	49(21.9)	28(12.5)		
Not sufficient	18(26.1)	27(39.1)	3(4.3)	14(20.3)	7(10.1)		
Other	2(11.2)	6(33.3)	0(0.0)	4(22.2)	6(33.3)		

Discussion

According to our study, digital health literacy and its associated factors were accessed among university students during COVID-19 pandemic in Malaysia. Health literacy was understood as the ability to access, understand, appraise and apply information to make health decisions and be competent regarding decisions in health-related situations.^{14,15,16} Findings from our study suggest that, there was a strong association between health literacy and internet access and the results have shown that, participants with adequate levels of digital literacy were more likely to access the internet and also use it to look

for information regarding COVID-19^(17,18,19).

According to our findings, we found that age factors played an important role in one's awareness of about health related to digital literacy, whereby the majority of the participants (90%), aged between 21-35 years old, had a better understanding of health literacy and they were more competent when it comes to navigating web-based information seeking in relation to the current pandemic situation. These findings consistent with the research done in Germany, when considering differentiation by age group, in all subscales, a slight tendency of increasing

level of digital health literacy with increasing age was observed (15). Age particularly is a major factor that influenced the digital health literacy (DHL)(20,21,22,23).

Our study also revealed that, the female gender was 0.56 times (95% CI: 0.31,0.98) more likely to have a good DHL ability when compared to males. On the other hand, a study done in Germany shows that, gender distribution was almost balanced, with 51.5% male university students (7687/14,916) and 48.5% female students (7229/14,913). Apart from that, socio-demographic characteristics particularly education background, income level, marital status and race are also associated with having access to the internet. This implies that a 'digital divide' exists in the sample of participants surveyed in this study. These findings are consistent with previously reported findings (24). DHL was also higher among graduate-level students (97.4%) compared to those with other educational backgrounds. This indicates that students improve knowledge and handling over time (25).

In the previous study, taking the strength of the association into account, female had higher effects on information searching about 39.5% compared to man (28.9%) which had significant with p less than 0.05 ($p < 0.05$) (26). This clearly shows that; most students are engaged with the web-based information. Additionally, search engines, news portals, and websites of public bodies were most often used by the respondents as sources to search for information on COVID-19 and related issues (27,28). These findings were consistent with the findings from our study followed by social media platforms such as Facebook, Instagram, and Twitter, or video portals such as YouTube, with 37.6% of respondents. However, in our research; search engines such as Google, Bing, and Yahoo (68.5) were often used as a whole and when comes

to the social media platform, Twitter (55.4%), Facebook (47.7%), and Instagram (40.4%) were notably used.

Limitations: Our study had several limitations. Due to the effects of the COVID-19 pandemic on physical contact and face-to-face meeting, we had to use a web-based survey, and the application of a web-based questionnaire may exclude people with weak digital competencies (29). Therefore, a potential bias in our sample is that, it may have excluded participants who use the internet to a lesser extent or those with lower digital competencies (30) We may have missed many participants who use the internet less frequently (31,32). Moreover, the contact details of the respondents were not collected due to ethical requirements for anonymity and confidentiality. Another limitation that should have considered is its cross-sectional design, which does not establish causality among the variables and surveys with close-ended questions, have a lower validity rate compared to open-ended types of questions and thus respondents may not be honest when answering the survey questionnaire(33,34).

Conclusion: Our hypotheses for this research are Malaysian university students have high levels of digital health literacy and web-based information seeking among university students during COVID-19 pandemic in Malaysia; socio-demographic factors have positive association to digital health literacy and web-based information seeking among university students during COVID-19 pandemic in Malaysia. This gives evidence that, a good number of university students are digitally literate. Additionally, socio-demographic variables: age, gender, race, residents, occupational status, educational status, marital status, family income and employment status were significantly associated with the level of digital health literacy during the COVID-19

pandemic. Therefore, in order to minimize the growing number of health problems due to poor digital health literacy, the Malaysia government may need to implement digital health awareness talks or campaigns and also training workshops for searching health-related information from trusted sources and hotlines especially for general population by mainly focusing on older adults' population.

Funding: There was no funding provided in this study.

Conflicts of interest: The authors declare no conflict of interest.

Ethics approval: Ethical approval was granted from the Human Research Ethics Committee, Center of Research and Development (CRD), Asia Metropolitan University (AMU), Malaysia. The ethic approval number was AMU-CRD-FRM006; REV: 00.

Author contributions: TMK, AGD, and SMM devised the project, the main conceptual ideas, and proof outline. TMK and AGD collected and analyzed the data. TMK, SMM and VDU contributed to the interpretation of the results. SMM and VDU took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis, and manuscript. The author(s) read and approved the final manuscript.

References

- Dadaczynski K, Orkan O, Messer M, et al. Digital Health Literacy and Web-Based Information-Seeking Behaviors of University Students in Germany During the COVID19: Pandemic Cross-sectional Survey Study. *J Med Internet Res.* 2021;23(1):e24097. doi: 10.2196/24097. <https://doi.org/10.2196/24097> PMID:33395396 PMCID:PMC7813561
- World Health Organization. Pneumonia of unknown cause - China. 2020. [Available from: <https://www.who.int/csr/don/05-january-2020-pneumonia-of-unknown-cause-china/en/>]
- Chen YY, Li CM, Liang JC, Tsai CC. Health information obtained from the internet and changes in medical decision making: Questionnaire development and cross-sectional survey. *J Med Internet Res.* 2018;20(2), e47. doi: 10.2196/jmir.9370. <https://doi.org/10.2196/jmir.9370> PMID:29434017 PMCID:PMC5826978
- Hua J, Shaw R. Corona Virus (COVID-19) "Infodemic" and Emerging Issues through a Data Lens: The Case of China. *Int J Environ Res Public Health.* 2020;17(7):2309. doi: 10.3390/ijerph17072309. <https://doi.org/10.3390/ijerph17072309> PMID:32235433 PMCID:PMC7177854
- Dadaczynski K, Okan O, Messer M, et al. Digital Health Literacy and Web-Based Information-Seeking Behaviors of University Students in Germany During the COVID-19 Pandemic: Cross-sectional Survey Study. *J Med Internet Res.* 2021;23(1):e24097. doi: 10.2196/24097. <https://doi.org/10.2196/24097> PMID:33395396 PMCID:PMC7813561
- Schaeffer D, Berens E, Vogt D. Health Literacy in the German Population. *Dtsch Arztebl Int.* 2017;114(4):53-60. doi: 10.3238/arztebl.2017.0053. <https://doi.org/10.3238/arztebl.2017.0053>
- Okan O, Bollweg TM, Berens E, Hurrelmann K, Bauer U, Schaeffer D. Coronavirus-Related Health Literacy: A Cross-Sectional Study in Adults during the COVID-19 Infodemic in Germany. *Int J Environ Res Public Health.* 2020;17(15):5503. doi: 10.3390/ijerph17155503. <https://doi.org/10.3390/ijerph17155503> PMID:32751484 PMCID:PMC7432052
- Van der Vaart R, Drossaert C. Development of the Digital Health Literacy Instrument: Measuring a Broad Spectrum of Health 1.0 and Health 2.0 Skills. *J Med Internet Res.* 2017;19(1):e27. doi: 10.2196/jmir.6709. <https://doi.org/10.2196/jmir.6709> PMID:28119275 PMCID:PMC5358017
- Nkomo N, Ocholla D, Jacobs D. Web Information Seeking Behaviour of Students and Staff in Rural and Urban Based Universities in South Africa: A Comparison Analysis. *Libri.* 2011;61. 281-97. doi: 10.1515/libr.2011.024. <https://doi.org/10.1515/libr.2011.024>
- Raju NV, Narayanaswamy NS. Online survey tools: A case study of Google Forms. Paper presented at the National Conference on "Scientific, Computational & Information Research Trends in Engineering, January, 2016; GSSS-IETW, Mysore.
- Bryman A, Bell E. *Business Research Methods*, 2nd edition. 2007. Oxford University Press.
- Saunders M, Lewis P, Thornhill A. *Research Methods for Business Students*, 6th edition, 2012. Pearson Education Limited.
- Kearney MW. Cramér's V. In: *Sage Encyclopedia of Communication Research Method*, Allen MR (ed) 2017.
- Sørensen K, van den Broucke S, Fullam J, et al. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health.* 2012;12:80. <https://doi.org/10.1186/1471-2458-12-80> PMID:22276600 PMCID:PMC3292515
- Lenartz N. Gesundheitskompetenz und Selbstregulation. V&R

- Unipress University Press, In: Applied Research in Psychology and Evaluation. 2012.
16. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. *Health Promot Int.* 2000;15: 259-67. <https://doi.org/10.1093/heapro/15.3.259> <https://doi.org/10.1093/heapro/15.3.259>
 17. van der Vaart R, Drossiest C. Development of the Digital Health Literacy Instrument: Measuring a Broad Spectrum of Health 1.0 and Health 2.0 Skills. *J Med Internet Res.* 2017;19(1):e27. doi: 10.2196/jmir.6709 <https://doi.org/10.2196/jmir.6709> PMID:28119275 PMCID:PMC5358017
 18. Sørensen K. Covid-19: Digital health literacy is a key to saving time, costs and lives. *ICT & health.* 2020 Mar 30. [Available from: <https://www.ictandhealth.com/news/covid-19-digital-health-literacy-is-a-key-to-saving-time-costs-and-lives>].
 19. Wieler L, Gottschalk R. Emerging COVID-19 success story: Germany's strong enabling environment. *Our World in Data.* 2020 Jun 30. URL: <https://ourworldindata.org/covid-exemplar-germany> [accessed 2020-09-05]
 20. Watkins I, Xie B. eHealth literacy interventions for older adults: a systematic review of the literature. *J Med Internet Res.* 2014;16:e225. doi: 10.2196/jmir.3318. <https://doi.org/10.2196/jmir.3318> PMID:25386719 PMCID:PMC4260003
 21. Paige SR, Miller MD, Krieger JL, Stellefson M, Cheong J. Electronic health literacy across the lifespan: measurement invariance study. *J Med Internet Res.* 2018;20:e10434. doi: 10.2196/10434. <https://doi.org/10.2196/10434> PMID:29986848 PMCID:PMC6056742
 22. Baker L, Wagner TH, Singer S, Bundorf MK. Use of the internet and e-mail for health care information: results from a national survey. *JAMA.* 2003;290(3):334. doi: 10.1001/jama.289.18.2400. <https://doi.org/10.1001/jama.289.18.2400> PMID:12746364
 23. Miller LMS, Bell RA. Online health information seeking: the influence of age, information trustworthiness, and search challenges. *J Aging Health.* 2012;24(3):525-41. doi: 10.1177/0898264311428167. <https://doi.org/10.1177/0898264311428167> PMID:22187092
 24. Estacio EV, Whittle R, Protheroe J. The digital divide: examining socio-demographic factors associated with health literacy, access and use of internet to seek health information. *J Health Psychol.* 2019;24(12):1668-75. doi: 10.1177/1359105317695429. <https://doi.org/10.1177/1359105317695429> PMID:28810415
 25. Okan O, Sørensen K, Messer M. COVID-19: A guide to good practice on keeping people well informed. *The Conversation.* 2020. [Available from: <https://theconversation.com/covid-19-a-guide-to-good-practice-on-keeping-people-well-informed-134046>].
 26. Okan O, de Sombre S, Hurrelmann K, Berens EM, Bauer U, Schaeffer D. Covid-19-Gesundheitskompetenz der Bevölkerung COVID-19 based health literacy in the German population. *Monitor Versorgungsforschung.* 2020;13:40-45. doi: 10.24945/MVF.03.20.1866-0533.2222.
 27. Hua J, Shaw R. Corona Virus (COVID-19) "Infodemic" and Emerging Issues through a Data Lens: The Case of China. *Int J Environ Res Public Health.* 2020;17(7):2309. doi: 10.3390/ijerph17072309. <https://doi.org/10.3390/ijerph17072309> PMID:32235433 PMCID:PMC7177854
 28. Zarocostas J. How to fight an infodemic. *Lancet.* 2020;395(10225):676. doi: 10.1016/S0140-6736(20)30461-X. [https://doi.org/10.1016/S0140-6736\(20\)30461-X](https://doi.org/10.1016/S0140-6736(20)30461-X)
 29. Department of Statistics Malaysia. Social statistics bulletin: Malaysia 2019. Putrajaya: DOSM; 2019. [Available from: https://www.dosm.gov.my/v1/index.php?r=column/cthemebycat&cat=152&bul_id=eVZ5NnJPMm5PTEFxbVdWcERzdGNrZz09&menu_id=U3VPMldoYUxzVzFaYmNkWXZteGduZz09]
 30. Zhong B, Luo W, Li H, Zhang Q, Liu X, Li W, et al. Knowledge, attitudes and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci.* 2020;16:1745-52. doi: 10.7150/ijbs.45221. <https://doi.org/10.7150/ijbs.45221> PMID:32226294 PMCID:PMC7098034
 31. Hamzah MR, Mohamad E, Abdullah MY. Influence of health literacy on health information seeking behavior among students in public university. *J Komun Malays J Commun.* 2016;32(2):405-24. <https://doi.org/10.17576/JKMJC-2016-3202-21>
 32. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *Lancet.* 2020;395(10224):565-74. doi: 10.1016/S0140-6736(20)30251-8. [https://doi.org/10.1016/S0140-6736\(20\)30251-8](https://doi.org/10.1016/S0140-6736(20)30251-8)
 33. Van de Mortel TF. Faking it: social desirability response bias in self-report research. *Aust J Adv Nurs.* 2008;25(4):40-8.
 34. Paakkari L, Okan O. COVID-19: health literacy is an underestimated problem. *Lancet Public Health.* 2020;5(5):e249-e250. doi: 10.1016/S2468-2667(20)30086-4. [https://doi.org/10.1016/S2468-2667\(20\)30086-4](https://doi.org/10.1016/S2468-2667(20)30086-4)