

## ORIGINAL ARTICLE

# Knowledge and Attitude on Environmental Disasters Through Social Media Among University Students in Selected Universities in Selangor, Malaysia

Sarah Aina Sazali<sup>1</sup>, \*Haliza Abdul Rahman<sup>1,2</sup>, Azrin Shah Abu Bakar<sup>1</sup>

<sup>1</sup> Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

<sup>2</sup> Institute for Social Science Studies, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

## ABSTRACT

**Introduction:** Social media is one of the best platforms to swiftly obtain news and information, particularly among young adults. This study aimed to determine the level of knowledge and attitude on environmental disasters through social media among university students in Selangor, Malaysia. **Methods:** A cross-sectional study was conducted to determine the knowledge and attitude towards environmental disasters through social media among university students in selected universities in Selangor, Malaysia. A set of self-administered questionnaire with a close-response format was distributed online. **Results:** WhatsApp was the highest used social media at public university (49.1%), and private university (49.8%). The level of knowledge in public university (87.0%) and private university (66.7%) was moderate, while the attitude level of students at both universities was also moderate; public university (65.6%) and private university (81.1%). There was a significant difference between public and private university in knowledge ( $p < 0.05$ ,  $p = 0.012$ ) and attitude ( $p < 0.05$ ,  $p = 0.029$ ) towards environmental disasters through social media. Additionally, there was also a significant difference between ethnicity in regards to knowledge ( $p < 0.05$ ,  $p = 0.013$ ) and attitude ( $p < 0.05$ ,  $p = 0.026$ ) in both universities. **Conclusion:** There was a significant difference in knowledge and attitude towards environmental disasters through social media between public and private university. The awareness among students must be increased through frequent educational programs such as campaigns, workshops, and exhibitions on environmental disasters. Continuous educational methods can also be done through other initiatives such as introducing environmental disasters in the syllabus as a mandatory elective course in the university.

**Keywords:** Knowledge; Attitude; Environmental disasters; Social media; University students

## Corresponding Author:

Haliza Abdul Rahman, PhD  
Email: dr.haliza@upm.edu.my  
Tel: +603 - 97691860

## INTRODUCTION

Environmental disasters are defined as damages caused by humans which lead to natural disasters that can trigger diseases and death in plants, animals, and humans (1). For example, Malaysia is prone to monsoon floods, landslides, and severe haze episodes despite its location beyond the Pacific Rim of Fire. However, there is a relative lack of significant atrocities and damages caused by natural catastrophes such as earthquakes, typhoons, and volcanic eruptions. The country also faces significant property damage and fatalities due to the occasional man-made disasters (2). According to Rahman (3), Malaysia is

susceptible to moderate environmental disasters, but severe disasters are uncommon.

According to Chan (4), the most serious calamity in Malaysia is flooding, and this is supported by the World Bank Group (5) which reported that floods were the most frequent environmental disaster in Malaysia, over the span of 40 years, from 1980 to 2020. Over 770,000 people have been affected by floods in the past 20 years, with a mortality rate of 148 people, and cost US\$1.4 billion, or roughly RM5.82 billion, in damages (6). If all parties increased their preparedness and awareness, floods, landslides, and other types of natural disasters could have a lower impact on people, with the former being the most effective approach to decreasing catastrophic effects (3). Therefore, the urgency of spreading information is key to achieving that goal.

Social media is one of the best platforms to swiftly obtain news and information. The term social media refers to the type of media that allows individuals to connect and share information via the internet or mobile phones (7). Facebook, WhatsApp, Twitter, Instagram, and Tiktok are some of the most popular social networking platforms today in Malaysia. As of January 2021, there are about 28 million social media users in Malaysia, making Malaysia ranked 5th globally for Active Social Network Penetration (8). An estimated 86% of Malaysia's population utilizes social media (9). Moreover, mobile phones, the internet, and social media have become cultural trends, particularly among the Millennials, young adults between the ages of 18 and 29 (10). This finding is parallel in Malaysia as 34.5% of social media users in this country are between 18 to 24 years old (11). Therefore, the focus group of social media will be university students, since they fall within this age range.

The use of social media by university students is on the rise, as many of them rely on it for communication. A study by Ismail et al. (11) showed that youths were highly knowledgeable about social media, and that social media was also their preferred source of information during natural disasters. Other than that, social media also aided in the dissemination of information, assistance, and warnings (12). During the disaster, social media was utilized to provide information about available aid, facilities, and other options for individuals affected (13). Social media was also a promising tool for gathering scattered community information about emergency preparedness, and the community paid more attention to social media posts that raised awareness on certain issues (14). The internet, with its limitless data network, enables access to information in just a few seconds by utilizing social media platforms. In fact, the rise of social media and crowdsourcing has encouraged the deployment of human-centric strategies that allowed individuals to provide critical catastrophe-related information that could be utilized to improve disaster management's efficiency in decreasing natural disaster damage (15). In addition to that, social media provides an avenue that can be utilized to aid in crisis management and, as a result, lessen the destruction of infrastructure and human life (16). Hence, social media is a valuable tool to increase university students' awareness on environmental disasters.

Lau (17) indicated that social media has become almost indispensable in today's culture, especially among university students, who are active social media users. Furthermore, 52% of undergraduates use social media more than seven times per day, and 92.7% of undergraduates use it daily (18). However, there are limited studies that explored the knowledge and attitude of environmental disasters through social

media among university students. Hence, this study is crucial to assess university students' knowledge and attitude towards environmental disasters through social media. Besides that, this study was also conducted to examine the association of socio-demographic factors of university students with their knowledge and attitude on environmental disasters through social media.

## MATERIALS AND METHODS

A cross-sectional study was carried out at two universities in Selangor which were directly affected by floods in December 2021 – Universiti Putra Malaysia (UPM) and Universiti Tenaga Nasional (UNITEN). UPM and UNITEN, a public and a private university, are in close proximity in a heavily populated student area. There was also a high probability that the students utilized social media and were exposed to various types of information on environmental disasters. Therefore, the inclusion criteria for this study were undergraduate students enrolled at the universities who used social media. The exclusion criteria for this study was fourth years undergraduate students and above. Purposive sampling was used to select the universities, while stratified sampling was used to select the university students for this study. The undergraduate students from each university were stratified by year of study; first year, second year, and third year. This method was used to ensure the diversity of students according to the year of study as UNITEN only had a maximum of three years of study (19). Other than that, the confounding field of study was limited only to non-science-based faculties.

### Sample Size

The sample size calculation was determined following the objectives of the study. To assess the level of knowledge and attitude on environmental disasters through social media among university students in universities in Selangor, the one proportional formula was used for the calculation. The formula is as shown below:

One Proportional Formula:

$$n = \frac{Z^{2(1-P)} P (1 - P)}{d^2}$$

Where,

n = sample size,

Z = Z value (1.96 for 95% confidence level)

P = expected prevalence or proportion (in proportion of one; if 20%, P=0.2)

d = confidence interval expressed as decimal (5%=0.05)

The assumption P was adapted from a previous study (20) concerning knowledge and attitude toward environmental disasters, where is P = 50%.

Meanwhile, the sample size to determine the association between socio-demographic variables with knowledge and attitudes toward environmental disaster was calculated using the two proportional formula. The sample size compares the knowledge and attitude toward environmental disaster through social media among university students between a public and private university in Selangor. The formula is as shown below:

Two proportion formula:

$$n = \frac{\{[Z_{1-\frac{\alpha}{2}}\sqrt{2P(1-P)} + Z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}]\}}{(P_1 - P_2)^2}$$

Where,

$$P = (P_1 + P_2)/2$$

$$P_1 = \text{estimated proportion of unexposed with the expected outcome}$$

$$P_2 = \text{estimated proportion of exposed with the expected outcome}$$

$$Z_{1-\frac{\alpha}{2}} = 1.96$$

$$Z_{1-\beta} = 80\% = 0.842$$

The assumption P was adapted from a previous study on knowledge and attitude on environmental disasters, where P1 = 70% and P2 = 97% (21).

The highest total sample size was 218, therefore 218 students would need to be recruited in this study. However, with the addition of an estimated 20% dropout, the final sample size was 264 subjects. Out of the 264 respondents needed from the sample size calculation; 263 students participated in this study. A set of self-administered questionnaire with a close-response format of questions was adapted and modified based on previously distributed questions to the targeted undergraduate students in both universities (22). Full clarification on the research and the consent form were listed on the first page for the respondents to read before answering the questionnaire. The protocol for this research was approved on 7 September 2022 by the ethics committee of Universiti Putra Malaysia (JKEUPM), with reference number JKEUPM-2022-440. For this study, 25 university students were involved with the confirmation of the questionnaire's reliability and validity. The Cronbach's Alpha test was used to determine the value for validity which was 0.868, indicating its significance.

### Study Instrumentation

A set of self-administered questionnaire with a close-response format of questions was adapted and modified using questions based on a previous study to

determine the level of knowledge and attitude toward environmental disasters among university students (22). The questionnaire was bilingual; Malay and English, so that it would be understood by most university students. The variables in the questionnaire were separated into four parts; Part A, Part B, Part C, and Part D. Part A included the socio-demographic information of university students which consisted of age, gender, ethnicity, year of study, and type of social media users. Part B included the use of social media to access environmental disaster information.

In Part C, 20 statements related to environmental knowledge through social media were asked. This part was divided into three elements which were news, factors, and effects of environmental disasters. The university students were requested to select true, false, or unsure for each statement. There was a maximum score of 20.00 for knowledge. Based on the mean scores, the responses were arbitrarily classified. Students who scored less than 5 had a "low" level of knowledge on environmental disasters; students who scored 6–9 had a "moderate" level of knowledge; and students who scored 10 or more had a "high" level of knowledge (20).

Finally, 18 statements in Part D were related to environmental attitudes through social media. This part was divided into two elements which were perceived risk and efficacy belief of environmental disasters. Besides that, the level of attitude of university students comprised of five-point Likert-type items (Strongly disagree-disagree-neither agree or disagree-agree-strongly agree). The highest possible score was 72, which aimed to assess students' attitudes toward environmental disasters. Based on the mean scores, the responses were arbitrarily classified. Students who scored less than 19 had a negative attitude toward environmental disasters; students who scored 20-39 had an indifferent attitude; while students who scored 40 or more had a positive attitude (20).

## RESULTS

This study was conducted in two universities in Selangor. In this study, 263 out of 264 students (99.62% response rate) from a public university (n=131) and private university (n=132) were selected to assess their knowledge and attitude on environmental disasters through social media. The data collection for this study was distributed online using a Google Form.

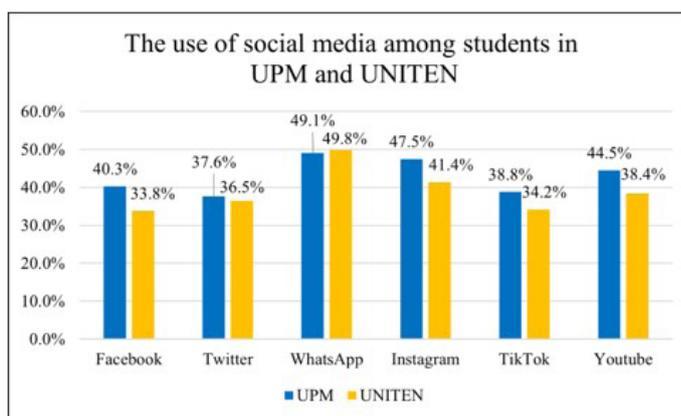
### Socio-demographic Profiles of University Students

Majority of the respondents from the public university were female (76.3%), while there were more male respondents from the private university (62.9%). Most of the respondents from both universities were

Malay, with 84.0% from the public university and 73.5% from the private university. Most of the respondents were aged between 19-24 years old, 96.2% from the public university and 87.1% from the private university. Additionally, second-year students were the highest number of respondents from public university with 20.2%, while third-year students from the private university was highest, with 22.1%.

**The use of Social Media to access Environmental Disaster information among Public and Private University**

Figure 1 summarizes the use of social media among public and private university. For type of social media, most of the respondents in the public university used Facebook (40.3%), Twitter (37.6%), WhatsApp (49.1%), Instagram (47.5%), Tiktok (38.8%), and YouTube (44.5%). Similarly, most of the respondents from the private university also used Facebook (33.8%), Twitter (36.5%), WhatsApp (49.8%), Instagram (41.4%), Tiktok (34.2%), and YouTube (38.4%). Only 3.0% of respondents from the public university and 0.4% of the respondents from the private university used other types of social media, namely Snapchat, LinkedIn, Telegram, HoYoLAB, Quora, and Reddit.



**Figure 1 :** Shows the use of social media among students in UPM and UNITEN.

**Level of Knowledge of University Students towards Environmental Disasters**

The level of knowledge of the respondents on environmental disasters and their distribution is shown in Table II. Majority of the respondents from the public university and the private university had a moderate knowledge level, which was 114 (87.0%) and 88 (66.7%), respectively. Whereas 7 (5.3%) respondents from the public university and 30 (22.7%)

**Table I : Socio-demographic profiles of students (N=263)**

Socio-demographic profiles	Public university (n=131) N (%)	Private university (n=132) N (%)
<b>Gender</b>		
Male	31 (11.8%)	83 (31.6%)
Female	100 (38.0%)	49 (18.6%)
<b>Ethnicity</b>		
Malay	110 (84.0%)	97 (73.5%)
Chinese	7 (5.3%)	21 (15.9%)
Indian	8 (6.1%)	11 (8.3%)
Others	6 (4.6%)	3 (2.3%)
<b>Age</b>		
18 years old and below	4 (1.5%)	7 (2.7%)
19-24 years old	126 (47.9%)	115 (43.7%)
25-30 years old	1 (0.4%)	9 (3.4%)
Above 30 years old	0 (0%)	1 (0.4%)
<b>Year of Study</b>		
Year 1	35 (13.3%)	39 (14.8%)
Year 2	53 (20.2%)	35 (13.3%)
Year 3	43 (16.35%)	58 (22.1%)

**Table II : Knowledge on Environmental Disasters among both universities (N=263)**

Level of knowledge	Frequency		Percentage (%)	
	UPM	UNITEN	UPM	UNITEN
High knowledge	10	14	7.6	10.6
Moderate knowledge	114	88	87.0	66.7
Low knowledge	7	30	5.3	22.7

from the private university were perceived as having a low level of knowledge. Only 10 (7.6%) respondents from the public university and 14 (10.6%) of respondents from private university had a high level of knowledge on environmental disasters.

#### Level of Attitude of University Students towards Environmental Disasters

The distribution of the level of attitude towards environmental disasters is shown in Table III. Majority of the respondents from both universities which is public university, 86 (65.6%) and private university, 107 (81.1%) had a moderate level of attitude towards environmental disasters through social media. Seven (5.3%) respondents from the public university and five (3.8%) respondents from the private university had a good level of attitude towards environmental disasters through social media. On the other hand, 38 (29.0%) respondents from the public university, and 20 (15.2%) from the private university had a low level of attitude towards environmental disaster.

#### Comparison of Knowledge and Attitude towards Environmental Disasters among the students at Public and Private University

Based on the normality test, the result obtained for the knowledge score was  $p < 0.05$ . Hence, the Mann-Whitney U test, a non-parametric test, was conducted to compare the knowledge among the students at the public and the private university. As listed in Table 4, the mean rank of public university (140.74) was higher than the private university (123.33), indicating that the knowledge score of public university was higher than that of the other university. Based on Table IV, the p-value obtained from the test was 0.012, less than 0.05, showing a significant difference in the median knowledge score between both universities.

Based on the normality test, the result obtained for the attitude score was  $p < 0.05$ . Hence, the Mann-Whitney U test, a non-parametric test, was conducted to compare the attitude among the university

**Table III : Attitude on Environmental Disasters among both universities (N=263)**

Level of attitude	Frequency		Percentage (%)	
	Public university	Private university	Public university	Private university
Good attitude	7	5	5.3	3.8
Moderate attitude	86	107	65.6	81.1
Low attitude	38	20	29.0	15.2

**Table IV : Knowledge on Environmental Disasters among both universities (N=263)**

Group	N	Median (IQR)	Mean Rank	Z-statistics	p-value
Score Knowledge					
Public university	131	2.00 (0)	140.74	-2.518	0.012*
Private university	132	2.00 (0)	123.33		

N=263, Mann-Whitney U test \*significant at  $p < 0.05$

**Table V : Attitude on Environmental Disasters among both universities (N=263)**

	Group	N	Median (IQR)	Mean Rank	Z-statistics	p-value
Score Attitude	Public university	131	2.00 (0)	124.07	2.185	0.029*
	Private university	132	2.00 (0)	139.87		

N=263, Mann-Whitney U test \*significant at p<0.05

**Table VI : Association between socio-demographic information with knowledge (N=263)**

Variables	Level of knowledge, n (%)			χ <sup>2</sup> (df)	p-value
	Good	Moderate	Low		
Gender					
Male	22 (8.4)	83 (31.6)	9 (3.4)	4.665 (2)	0.097
Female	15 (5.7)	119 (45.3)	15 (5.7)		
Ethnicity					
Malay	27 (10.3)	163 (62.0)	17 (6.5)	16.177 (6)	0.013*
Chinese	9 (3.4)	17 (6.5)	2 (0.8)		
Indian	0 (0.0)	17 (6.5)	2 (0.8)		
Others	1 (0.4)	5 (1.9)	3 (1.1)		
Age					
≤18	1 (0.4)	9 (3.4)	1 (0.4)	9.149 (6)	0.165
>18-24	36 (13.7)	185 (70.3)	20 (7.6)		
>24-30	0 (0.0)	8 (3.0)	2 (0.8)		
>30	0 (0.0)	0 (0.0)	1 (0.4)		
Year of Study					
Year 1	12 (4.6)	55 (20.9)	7 (2.7)	5.720 (4)	0.221
Year 2	15 (5.7)	69 (26.2)	4 (1.5)		
Year 3	10 (3.8)	78 (29.7)	13 (4.9)		

N=263, Chi-square test \*significant at p<0.05

students at the public and the private university. As listed in Table V, the mean rank of the public university (124.07) was lower than the private university (139.87), indicating that the attitude score of private university was higher than that of the other university. Based on Table V, there was a significant difference in the median attitude score between both universities, where the p-value was 0.029, less than 0.05.

**Association between Socio-demographic Profiles with Knowledge and Attitude towards Environmental Disasters through Social Media among the University Students at Public and Private University**

As shown in Table VI, there was no association between gender, age, and year of study with the university students' knowledge. However, there was an association between the ethnicity of the university students and their knowledge on environmental

**Table VII: Association between socio-demographic information with attitude (N=263)**

Variables	Level of attitude, n (%)			$\chi^2$ (df)	p-value
	Good	Moderate	Low		
Gender					
Male	24 (9.1)	86 (32.7)	4 (1.5)	0.697 (2)	0.706
Female	34 (12.9)	107 (40.7)	8 (3.0)		
Ethnicity					
Malay	51 (19.4)	146 (55.5)	10 (3.8)	14.396 (6)	0.026*
Chinese	4 (1.5)	24 (9.1)	0 (0.0)		
Indian	3 (1.1)	16 (6.1)	0 (0.0)		
Others	0 (0.0)	7 (2.7)	2 (0.8)		
Age					
≤18	1 (0.4)	10 (3.8)	0 (0.0)	5.626 (6)	0.466
>18-24	53 (20.2)	177 (67.3)	11 (4.2)		
>24-30	4 (1.5)	5 (1.9)	1 (0.4)		
>30	0 (0.0)	1 (0.4)	0 (0.0)		
Year of Study					
Year 1	19 (7.2)	51 (19.4)	4 (1.5)	2.986 (4)	0.560
Year 2	17 (6.5)	69 (26.2)	2 (0.8)		
Year 3	22 (8.4)	73 (27.8)	6 (2.3)		

\*significant at p&lt;0.05

disasters. The p-value for ethnicity and age were less than 0.05, indicating that there was a significant association between ethnicity and knowledge of university students.

There were also no association between gender, age, and year of study with university students' attitude levels in both universities. However, there was a significant association with ethnicity and attitude level, as shown in Table VII. The value obtained was 0.013, less than 0.05. Thus, there was an association between ethnicity and level of attitude of respondents.

## DISCUSSION

This study examined the knowledge and attitude of the university students on environmental disasters through social media. Some types of social media frequently used in Malaysia include Facebook, Twitter, WhatsApp, Instagram, TikTok, and YouTube. In this study, the results showed that WhatsApp was the most-used social media among university students. This result was supported by Social media penetration in Malaysia (23) which highlighted that WhatsApp

had the most users in Malaysia, followed by Facebook and Instagram. Additionally, a survey done in Malaysia among the age group of 18 years old and above from January to February of 2021 found that 89% of participants acquired their news from the internet and through social media (9). The results also showed that WhatsApp was the most frequently used social media among public and private university students. According to Patel et al. (24), WhatsApp is a messaging application for smartphones that also can be used to send images, video, and audio media messages. WhatsApp is instantaneous, commercially available, and can be utilized cross-platform. This finding coincides with the results of a previous study done by Chipunza (25) who highlighted that WhatsApp was a helpful technological tool for promoting knowledge exchange among college students on a variety of topics related to the courses they were enrolled in (25). Therefore, it is crucial for authorities such as the Ministry of Communications and Digital, as well as the National Disaster Management Agency (NADMA) to combat the spread of false information by channelling first-hand information directly through the most highly used social media, WhatsApp.

Based on the results of this study, most of the respondents from both universities had moderate knowledge on environmental disasters. Most people may have known, heard, or read about the severity of environmental disasters in Malaysia, however, they might have had little exposure to the specific knowledge on environmental disasters. For example, according to Tkachuck (26), students who receive the appropriate instruction are not only capable of imparting valuable knowledge, but also have the potential to positively influence information transmission and implementation in relation to disaster readiness and response. Apart from knowledge, the attitude of students was also a crucial factor that may influence awareness and can help mitigate the occurrence of environmental disasters. According to Buhlerengen et al. (27), environmental conservation depends on the attitude and action of young people. Young people may be given the tools they need to actively contribute to their surroundings through good attitude and behavior, if positive development is encouraged. Previous research showed that students are viewed favorably on social media sites like YouTube after they search for videos to advance their knowledge and ability on natural disasters (28). This implies the need to enhance the factors and effects of environmental disasters knowledge among the university students.

There were significant differences found on knowledge and attitude towards environmental disasters through social media among the students in both universities. This may be due to the availability of information and the coverage in social media. Besides that, the different environments and circles could also affect the knowledge and attitude of the university students. These findings were in line with previous research by Sari et al. (29) who reported that online media exerts a huge influence on the source of disaster information, indicating that there are differences in knowledge and attitude of students from both universities.

Furthermore, there was no significant difference between the knowledge level and gender, age, and year of study of the respondents. However, there was a significant difference between ethnicity and knowledge of environmental disasters. These findings are similar to the study by De Lavega (30) who suggested that neither gender nor age had a significant difference on knowledge, whereas there was a significant difference between ethnicity and knowledge. However, there are not many past studies to support the association between knowledge and the year of study. This may be due to the year of study not having a significant impact on a person's knowledge of environmental disasters compared to age. Additionally, one of the findings also states there is no connection between their

environmental awareness and gender (31). Moreover, environmental knowledge in established populations was assessed from their experiences, worldviews, environmental behaviors of immigrants from diverse backgrounds, ethnic groups, and life histories. Thus, this leads to the significance of knowledge on environmental disasters among university students (32).

Further analysis showed that there were significant differences between attitude levels and ethnicity. Most Malay university students showed a high level of attitude towards environmental disasters through social media. According to the NEP, Malays tend to have more a positive pro-environmental attitude than previously stated (33). This also might lead to different preferences for social media uses related to environmental disasters according to each ethnicity. For example, although social media use among Latinos, Blacks, and Whites is very similar, there are notable disparities in their interests for social media platforms, such as White people prefer Pinterest, while Latinos prefer Instagram (34).

## CONCLUSION

The findings from this study underscore the importance of knowledge and attitude between public and private university students towards environmental disasters through social media. This study demonstrated that there is a moderate level of knowledge and attitude towards the environmental disasters through social media among the students in both universities. The study also showed a significant difference between the knowledge and attitude of students from the public and private university. Additionally, there is a significant difference between ethnicity in knowledge and attitude towards environmental disasters through social media among the students from the public and private university.

Based on these results, there is a need for frequent education programs such as campaigns, workshops, and exhibitions on environmental disasters among university students since some are not aware of current issues. Students can be educated on how to prepare for natural catastrophes, similar to Japan, so they can protect themselves. The content of the program must help enhance the knowledge of the university students concerning factors and effects of human activities which lead to floods, landslides, haze, drought, etc. For instance, they can understand disasters and participate in simulated disasters through their own institutions for disaster mitigation experience-learning (35). Furthermore, continuous educational methods can be done through other environmental programs such as introducing environmental disasters in the syllabus as a mandatory elective course in the university. This can expose students to theory-based

knowledge and environmental activities so that there would be an improvement in their attitude. Therefore, the students' knowledge and attitude toward environmental disasters would go hand-in-hand. Authorities such as the Ministry of Communications and Digital, as well as NADMA, need to work together to combat the spread of false information by channelling first-hand information directly through social media, especially WhatsApp. Hence, any irrelevant information that might be misleading can be avoided. For this to become a reality, the government must guarantee that students can always access their devices and internet network.

In the future, this study can be expanded to include all universities in Malaysia. This study can also focus on different fields of study such as science and non-science students to determine whether science students have more knowledge on environmental disasters compared to non-science students.

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