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## *Information seeking behavior of university students during 2023 dengue outbreak: A developing country perspective*

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### **Abstract**

**Background of the study:** Dengue outbreak has become a regular phenomenon in Bangladesh. It has created a panic among people from all walks of life.

**Purpose:** The study was conducted to gain insights about the dengue related information seeking behavior of university students of Bangladesh during 2023 dengue outbreak.

**Method:** In this study, a survey was conducted with an online questionnaire here. 532 students from different universities of Bangladesh have participated. Mann-Whitney and Kruskal-Wallis test was applied to determine the relationships between different demographic variables and the choice of information sources, purpose of seeking information.

**Findings:** In this study, majority of students use social media platforms as their primary source of information regarding dengue virus. Most of the students seek information to mainly know about the disease and the safety products related to the virus. There was a significant difference between the residence of the respondents and their choice of information sources. The respondents also have identified several barriers to dengue related information. They mostly regarded the lack of medical terminologies and lack of necessary steps by the educational institutions as the primary barriers.

**Conclusion:** Dengue outbreak has become a regular phenomenon in Bangladesh. It is imperative for students to seek necessary information regarding the dengue virus. The authorities must take care of the preference of the students regarding the choice of information source while giving them proper information.

**Keywords:** *Dengue, Information seeking, Students, University Students, Bangladesh*

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## Introduction

Dengue is a very common mosquito borne disease which is very common in many parts of the world. It spreads with the bite of mosquitoes of *Aedes* species. Every year almost 400 million people are infected with the dengue virus. Almost 40,000 people die from this virus every year (CDC, 2023). Most of the countries known for regular dengue outbreaks are situated in Asia. Specially in southeast Asian countries like Philippines, Thailand and Indonesia is known for regular and fatal dengue outbreaks (Hsan, Hossain, Wilder-Smith, & Sarwar, 2019).

Dengue outbreaks have become a regular phenomenon in many parts of the world and people are quite familiar disease. In spite of that people lack proper knowledge about the disease. Education level of the population often play a huge role in the knowledge gaining regarding dengue among the population and the proper knowledge about the disease is also associated with proper preventive practices (Elson et al., 2020).

Bangladesh also has seen regular dengue outbreaks in recent years. The first official outbreak was reported in 2000. The number of infected individuals and fatalities also have increases since then (Mamun et al., 2019). During the 2019 Dengue outbreak, the infection rate saw an unprecedented rise above 1,00,000 cases (Bhowmik, Ferdous, Baral, & Islam, 2023). Recently, the country has witnessed another outbreak. Between 1<sup>st</sup> January -7<sup>th</sup> August, 2023 the confirmed cases stood at 69,483 and there were 327 dengue related fatalities. The dengue cases saw a sharp rise during late June and July 2023. The total confirmed cases this year has broken all the records since the first officially declared outbreak in 2000 (WHO, 2023).

Unfortunately, no vaccines are available to cure the dengue virus. The prevention of dengue virus largely depends on the people's knowledge regarding the virus. People's knowledge will ensure larger community involvement in containing dengue outbreaks. It is also proven from studies that Dengue virus risk is lower among communities having proper knowledge regarding the virus. Although most of the people are aware of Dengue virus in Bangladesh but most of the people are not even aware of the common symptoms. The socioeconomic variables are also a large factor in this issue. (Udayanga et al., 2018). Dengue outbreaks may create serious health risks for slum dwellers and other neglect groups. They live in areas with the highest risks of dengue infection but they lack proper knowledge regarding the virus. They follow people they know regarding treatment of any disease (Rahman et al., 2023). In a study on the dengue related knowledge of city dwellers in Dhaka city found that city dwellers were reluctant to take preventive measures to safeguard themselves from the dengue virus. Although they are aware of the fatal nature of the dengue virus, they regard the city corporation as the sole body responsible for controlling the outbreak. They also highlighted the negligence of authorities regarding controlling the outbreak (Bashar et al., 2020). Another study on the knowledge, attitude and Practice regarding dengue of Dhaka city residents found no significant difference between the residence of the respondents and their practice of preventive activities related to dengue virus (Rahman et al., 2021).

Information seeking is an important behavior which cannot be determined by any single factor (Zhang & Liu, 2023). It is natural for people to search for information whenever they face any risk and disasters. As result, a lot of information is available, which can be used by anyone according to their information needs (Khairunissa, 2023). Sometimes, information seeking gets influenced by different socio demographic variables (Al-Moteri, 2023).

Health Information Seeking Behavior (HISB) is a popular field to study the way people seek health related information. There are numerous ways to study health information seeking behavior of a particular population. Overall, any study related to HISB will include the study of health information sources, perceptions regarding health information and barriers regarding it (Anker, Reinhart, & Feeley, 2011). During Covid 19 pandemic, Health information behavior of people has helped the public health officials to come up with effective communication



strategies. The health information seeking of people has transformed a lot with the advent of technologies especially the Social Networking Sites (SNS) platforms. It can be used as an effective medium for crucial public health communications. On the other hand, it can also spread misinformation like wildfire. ([Neely, Eldredge, & Sanders, 2021](#); [Zhang & Liu, 2023](#)).

During Zika outbreaks the official announcements of public health officials triggered media coverage on ZIKA virus. The media coverage also prompted the public to seek information regarding Zika virus. This can be turned into a useful opportunity for officials if they can communicate with the public more effectively ([Randle, Nelder, Sider, & Hohenadel, 2018](#)). It was also found that certain public preferred the social media account of reliable organizations while searching for Zika related information. People also preferred messages given by famous personalities. They also tried to communicate with each other to share Zika related information. ([Lee & Jin, 2019](#)). In a study exploring the Dengue related information needs and information seeking in Pakistan found that, people having higher educational qualification having the highest number of information needs. People also try to seek information to keep themselves up to date about the disease. The age of people is also an important factor needed to be considered while studying information seeking ([Ahmad, Malik, & Mahmood, 2023](#)).

It is also common to use the internet for getting information during public health emergencies. People who use internet for getting health information reported to have good health. On the other hand, many people cannot get necessary public health information quickly as many of them cannot access internet properly. They tend to have poor health ([Seyedin & Jamali, 2011](#)). People generally try to use multiple information sources during crisis. They try to use both official and non-official information sources. They even discuss the crisis with family members ([Zach, 2011](#)). Any health-related communications during any emergencies should be effectively designed. The message should also be able to access the messages easily. People love to find important information on platforms they trust more. The credibility and accuracy of information will always remain an important factor ([Liu, Chen, Shi, & Yan, 2021](#)).

There are numerous studies focusing on the health information seeking behavior of student's study on online health information seeking behavior of Chinese students found that information literacy skills of Chinese students had an impact on information seeking behavior ([Zhang et al., 2021](#)). Students mostly use social media platforms and search engines for getting health information. Most of the students highlighted trustworthiness of sources as a huge problem They preferred doctors and evidence-based websites as the most trusted sources. Even after that, students often lack the skill to search for the correct information ([Hancher-Rauch, 2019](#)). it was also found during covid 19 pandemic that students preferred search engines and social media for seeking necessary information. Students prefer such sources as they are accessible through mobile phones. Students mainly wanted to know about the symptoms and daily updates. Even in this study, students reported low level of digital literacy skills ([Abdoh, 2022](#)). Students' adaptation of the internet as a source for health information has been seen with mixed reactions. It is regarded as an effective medium to bridge the gap between students and physicians. On the other hand, It has made the students vulnerable to inaccurate health information that can be harmful for them ([Dastaniet al., 2019](#)). Now it is a reality that a huge group of students use the internet for accessing health related materials. It is imperative to promote e health materials for the students so that they can easily access quality health information. It will make health information more affordable and accessible for them ([Adegbilero-Iwari, Oluwadare & Adegbilero-Iwari, 2021](#)).

Regardless of the language barriers most university students from any country use search engines and social media platforms for receiving healthy information. ([Osei Asibey, Agyemang, & Boakye Dankwah, 2017](#)). It was also found that students are focusing more on search engine quality rather than information quality. ([Chen, Zheng, Liang, Xie, & Gu, 2020](#)).

It is always important to create awareness among students regarding health literacy and information quality so that they are well equipped while seeking important health information



([Schafer et al., 2021](#)). Internet users generally prefer attributes like ease of use, disclosure of authors and proper attribution from online health information sources ([Barnes et al., 2003](#)). It is also important for the authorities to take care of preference of the information sources of the students. The same thing also applies for social media companies. This will help to provide the students with appropriate health content that will benefit them ([Li, Jiang & Zhang, 2021](#)).

Even in least developed countries students prefer online mediums, an important source for getting health information as it is regarded as a cheaper alternative to other sources ([Osei Asibey, Agyemang, & Boakye Dankwah, 2017](#)). In Bangladeshi context, students use internet for seeking health information more than the general population. Even in that case, the gender factor also plays a role. The role of authorities controlling the sources of information is also huge ([Waldman et al., 2018](#)).

It will always be helpful to understand people's information seeking behavior to know about the perceptions of people regarding Dengue Virus. In this study, the information seeking behavior of Bangladeshi University students during the Dengue Outbreak will be explored. Along with that, the barriers to information seeking and preferred information sources will also be studied. The aim of the study:

1. To gain insights about the information seeking behavior of Bangladeshi University students during Dengue Outbreak
2. To know about the sources of information and the purpose of seeking information
3. To determine the relationships between various demographic factors with the choice of information source and the purpose of seeking information
4. To know about the barriers while seeking information

## Method

### *Research Design*

Designed to collect data from respondents. The questionnaire was created with google form. The content of the questionnaire was on English language. The questionnaire had two parts. The first part focused on the demographic characteristics of the respondents and dengue infection history of the respondents and their family members the other part focused on the information seeking behavior. The questionnaire used three 5point Likert scale to gather information regarding information sources and reasons behind seeking dengue related information. Another five point Likert scale was also used to collect information regarding the barriers to information. Cronbach's alpha was used to determine the reliability of Likert scale questions. The score was 0.834 which is regarded as a better score.

### *Population, sample and location*

The authors able to receive responses 332 respondents. The questionnaire was sent to almost 400 students studying in various university students in Bangladesh.

### *Data collection*

The questionnaire was distributed through various social media platforms (Facebook messenger, WhatsApp) to various university students of Bangladesh. The survey was carried out between 25 August 2023 to 15 September 2023

### *Data analysis*

IBM SPSS version 25 was utilized for statistical analysis. The demographic data were presented using frequency. Frequency and descriptive statistics were utilized to describe the preference of information sources, barriers, and purpose for seeking dengue related information. The Mann Whitney was applied to know the differences between the choice of information



sources, to purpose of information seeking with gender, dengue infection history. Kruskal Wallis tests were employed to compare the differences between the choice of information sources, to purpose of information seeking with age, education and respondents.

## Result and Discussion

### *Demographic information*

In this study 532 university students from different universities have participated in the survey. Male students were 261(50.9%) in number whereas female students were 261(49.1%) in number. Among the respondents, 313 (58.8%) respondents were from city, 101(19%) of the respondents were from metropolitan, 67(12.6%) respondents were from town, 51 (9.6%) of them were from village. Respondents were from different age groups. Most of the respondents (366,68.8%) were from the age group 20-23. The second largest group of the respondents were from the age group 24-27(138,25.9%). There were also some respondents from age group 28-31 (10,1.9%) and 31 above (18,3.4%). Most of the respondents were undergraduate students (423,79.5%). Some of the students were graduate students (71,13.3%).and few of them (38,7.1%) were post graduate students.

Table 1 Demographic Information

Demographic Factors	N (%)
Gender	
Male	261 (49.1%)
Female	271(50.9%)
Age	
20-23	366(68.6%)
24-27	138(58.9%)
28-31	10(1.9%)
31 above	18(3.4%)
Residence	
Metropolitan	101(19%)
City	313(58.8%)
Town	67 (12.6%)
Village	51(9.6%)
Education	
Undergraduate	423(79.5%)
Graduate	71(13.3%)
Postgraduate	38(7.1%)

### *Dengue infection*

Only 59 (11.1%) of the respondents were infected with dengue and 473 (88.9%) of the respondents were never infected with dengue. Among the respondents, 149 (28%) of them have family members who were infected with dengue but 383 (72%) of the respondents did not have any family member infected with dengue Most of the respondents (386,72.6%) sought dengue related information while some of the respondents never sought such information (146,27.4).

### *Dengue related information sources*

The majority of people get their information through social media sites(mean=2.65). Many students also get their information from television and the news media. (mean=2.43). Respondents also seek information from family members. To obtain dengue-related information, respondents consult health professionals and health websites.



Table 2 Sources of Information

Information Sources	N	Mean	SD
Family members/friends	532	2.26	1.20
Social media	532	2.65	1.08
Newspapers, TV news	532	2.43	1.15
Health Websites	532	2.00	1.22
Doctors /Health Professionals	532	1.97	1.21

*Purpose of seeking information*

Most of the respondents (mean=2.86) seek information to know about the safety products and to know about the preventive measures (Mean=2.84). There are also many respondents who seek information to know about the disease (mean=2.75) and to know about the treatment (mean=2.76)

Table 3 purpose of Seeking Information

Purpose	N	Mean	SD
To know about the disease	532	2.75	1.01
To know about the treatment	532	2.76	0.98
To know about the preventive measures	532	2.84	1.01
To know about safety products	532	2.86	0.97
Psychological care	532	2.68	0.98
Daily update on the situation	532	2.63	1.01

The Mann Whitney test found that there are no significant differences between gender and the choice of dengue related information source except health websites (p=0.043) and consulting health professional (p=0.012). There was also no difference between the gender of students and their purpose of dengue related information seeking except for knowing about the safety products (p=0.033) and knowing the daily update (p= 0.035). There was also no relationship between previous history with dengue infection and the choice of the sources of dengue related information except getting information from doctors/health professionals (p=0.001). A similar scenario was found with respondents having relatives infected with dengue. No significant differences were found between respondents having dengue infected relatives and their source of dengue related information except getting information from family members /friends (p=0.001) and getting information from health professionals (p=0.003).

The Kruskal Wallis test revealed a significant difference between respondents' residence and their source of dengue sources. Significant differences were also detected between the residence of respondents and their choice of information sources. There was no difference between the residence of the respondents on their purpose of seeking dengue related information except for treatment (p=0.035) and knowing about the safety products (p=0.016). There was no significant difference found between the age of the respondents and their information source and purpose of information seeking. The same scenario was found with the education level of the respondents.

*Barriers to information*

Respondents were asked about the barrier to dengue related information. Respondents identified lack of understanding of medical terms (mean=2.43) and lack of steps taken by educational institutions (mean=2.40) as main barriers to get dengue related information. Respondents also identified lack of reliable information sources, lack of health professionals

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and lack of understanding of medical terms.

Table 4 barriers of Information Seeking

Barriers	N	Mean	SD
Lack of understanding of medical terms	532	2.43	1.07
Lack of reliable information sources	532	2.30	1.16
Lack of awareness campaign by the authorities	532	2.24	1.20
Lack of steps needed to be taken by educational institutions to inform	532	2.40	1.22
The students about the disease	532	2.13	1.27
Scarcity of health professionals	532	2.17	1.23

### Discussion

This study focused on the dengue related information seeking of university students of Bangladesh. It was found that most of the students prefer social media as a health information source. Social media, which has been around for a long time, is becoming increasingly important due to improvements in information technology making it easier to access and operate (Hapsari, et al., 2023). This trend was also seen in other countries as well. On the other hand, such preference is different when it comes to elder population who still prefers print/electronic media (Yilma, et al., 2017).

This study has not found any significant difference between age and gender with reference to information sources, purpose of getting information. But it has found significant difference between residence and information sources and purpose of information seeking. This is quite different from other studies where significant differences were found between health information seeking behavior and various socio demographic characteristics like age, gender, education etc. (Vader, Walters, Roudsari, & Nguyen, 2011). But in many studies residence of the respondents proved to be a crucial factor in determining their knowledge and preventive practices regarding dengue fever (Harapan et al., 2018).

In this study, the focus was also on the barriers faced by the students while dengue related information seeking. It was found that students identified lack of understanding of medical terms and lack of steps taken by educational authorities as the key barriers. This aligns well with the studies which found negligence of concerned authorities to communicate with public about dengue virus (Nguyen et al., 2019).

In this study, it is also found that people usually try to about the disease and safety products. This phenomenon is also common in regions where dengue outbreaks are very common. (Paz-Soldan et al., 2015; C. Yboa & J. Labrague, 2013). There was a significant difference between people with history of dengue and their purpose of seeking dengue related information. In many studies, it was found that people having dengue have an impact on their source and reasons for seeking dengue related information (Harapan et al., 2018; Nguyen et al., 2019). It is also found that dengue history influences preventive behavior of people which is also common in many places around the world

### Conclusion

Dengue outbreaks have become quite a regular phenomenon in our country. It has created havoc for people belonging to all sections of our country. This study focused on the information seeking behavior of the university students in Bangladesh. University students in Bangladesh mainly uses social media to seek dengue related information Sociodemographic variables like age, gender and level of education did not have significant difference on choice of information sources and purpose of seeking dengue related information. On the other hand,



residence of the students played a crucial role in determining the information sources and the purpose of information seeking. Students identified several barriers, but the majority of the students identified lack of steps taken by educational institutions and lack of understanding of medical terms. as the main barrier which is not uncommon in many underdeveloped and developing countries. It is also important to note that very few students prefer health professionals /doctors as information source. The relevant authorities must take steps to encourage students to consult health professionals/doctors. The students also should be provided with accurate information regarding the dengue epidemic. The students will benefit if the concerned authorities utilize social media platforms to spread information. The educational authorities also need to take concrete steps to make the students aware of the disease. They also should utilize social media platforms to disseminate dengue related information. Emergency health information also should be widely available for students so that they can easily access them whenever they facing dengue related issues. The complex medical terms should be made simple to the students so that they can easily understand necessary information which may assist in getting the accurate information in the correct time This study had several limitations. The authors could not reach out to university students living in remote areas. So, the finding of the research can not be generalized. We hope that there will more research on these issue in the future which will try to know about the dengue related information seeking behavior of broader groups of students.

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### Authors' Contributions

All authors have contributed to the final manuscript. The contribution of all authors: conceptualization, methodology, formal analysis, writing original draft preparation, writing review and editing. All authors have read and agreed to the published version of the manuscript.

### Conflict of Interest

All authors have no conflict of interest related to this study.

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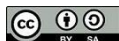




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