The information-seeking behavior and levels of knowledge, precaution, and fear of college students in Iloilo, Philippines amidst the COVID-19 pandemic

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ABSTRACT

COVID-19 pandemic is devastating the health, social, and economic well-being of citizens worldwide. The high rates of morbidity and mortality and the absence of vaccines cause fear among the people regardless of age, gender, or social status. People's fear is heightened by misinformation spread across all media types, especially on social media. Filipino college students are one of the top Internet users worldwide and are very active in social media. Hence they are very prone to misinformation. This paper aims to ascertain the levels of knowledge, precaution, and fear of COVID-19 of the college students in Iloilo, Philippines, and determine the effects of their information-seeking behavior on the variables above. This paper is a cross-sectional survey that used a qualitative-quantitative method and snowball sampling technique. Data were gathered among 228 college students using an online survey instrument a few months after the pandemic began. College students were knowledgeable of the basic facts about the highly infectious COVID-19. However, the majority were inclined to believe the myths and misinformation regarding the pandemic. Television was the primary, most believable, and preferred source when seeking information. The Internet as a preferred source of information was significantly associated with a high level of knowledge. In contrast, the information sourced from interpersonal channels were found to make college students very cautious. The local presence of COVID-19 cases had caused college students to fear, likely exacerbated by the plethora of information about the pandemic, mostly from Facebook. This is the first study conducted on the effects of the information-seeking behavior on the levels of knowledge, precaution, and fear of COVID-19 of the college students in Iloilo, Philippines.

1. Introduction

Coronavirus disease-2019 (COVID-19) is the most recent emerging infectious disease of zoonotic origin from the wet animal market in Wuhan City, Province of Hubei, China. Like other coronaviruses, symptoms include fever, cough, and fatigue [1]. However, some infected individuals show mild or no symptoms but could spread the disease to others [2], making the prevention and control challenging. Health institutions worldwide find it extremely difficult to curb due to its high infectivity and the lack of understanding of its immediate hosts and modes of transmission [3]. As a result, the World Health Organization (WHO) declared it a pandemic on March 11, 2020 [4].

COVID-19 is not as deadly as the other coronaviruses such as Severe Acute Respiratory Syndrome (SARS) and Middle East respiratory syndrome coronavirus (MERS-CoV). It has a fatality rate of less than 1% compared to SARS (9.5%) and MERS-CoV (34.4%) [5]. However, the number of deaths it is causing is higher than SARS and MERS combined [6]. As of April 22, 2020 [7], stated that COVID-19 has infected almost 2.5 million people and has claimed nearly 170,000 lives from 213 countries, areas, or territories since its outbreak in late December 2019.

Scientists and researchers worldwide are working hard to find an effective treatment for the disease, but as of May 2020, one has yet to be found [8,9]. Furthermore, COVID-19 also threatens the world economy [10]. The Asian Development Bank (ADB) forecasted that the monetary loss of the global Gross Domestic Product due to COVID-19 is expected to be about $77 billion to $347 billion US dollars [11]. In order to mitigate the health and economic impacts and to slow down its transmission, precautionary measures such as quarantine, social distancing, isolation of the infected population [12], and temporary closure of educational institutions [13] are being practiced and enforced in most countries worldwide.

Due to the temporary closures of schools, the education of around 1.3 billion students from 177 countries worldwide was disrupted [13]. In response, the Commission of Higher Education (CHEd) in the Philippines advised educational institutions to deploy available distance, online or e-learning, and other alternative modes of delivery instead of classroom learning if they have the resources. However, online instruction was immediately suspended due to the enhanced community quarantine [14]. The pandemic affects not only the physical and intellectual well-being of the students but also their mental and psychological well-being [15,92]. Despite the severe effects of the pandemic on students, only a few studies have been published on the subject [17], with very few about Filipino students. Thus, to further understand the effects of COVID-19 on the mental and psychological well-being of Filipino students and to fill the information gap, this study was conducted.

1.1. COVID-19 in the Philippines

The first cases of COVID-19 in the Philippines were tourists, a Chinese couple who arrived from Wuhan, China, on January 21, 2020 [18]. Eventually, the man succumbed to death while the woman recovered and returned to China [19]. On February 02, 2020, a day after the first death was recorded, President Rodrigo R. Duterte (PRRD) declared a temporary travel ban against China, Hong Kong, and Macau. However, despite the travel ban, the first local transmission was recorded on March 07, 2020, prompting the Department of Health (DOH) to declare a public health emergency to mobilize resources to prevent the spread of the virus [19].

On March 12, 2020, a day after WHO declared COVID-19 as a pandemic, PRRD placed Metro Manila under Community Quarantine from 15 March to April 14, 2020. PRRD also implemented a stricter measure by placing the entire Luzon Island under an Enhanced Community Quarantine (ECQ) due to the increasing COVID-19 positive cases and mortality rate. When the events mentioned above were taking place, the number of positive cases and the mortality rate increased rapidly. Some probable COVID-19 cases died without even knowing the test result [19]. From January 27, 2020 to April 22, 2020, there were 6710 positive cases throughout the country, 446 confirmed deaths, and 693 recoveries [20].

COVID-19 affects not only the country's health but also its economic condition. The International Monetary Fund (IMF) predicted that COVID-19 would slow down the country's economic growth, causing unemployment to rise [21]. On March 25, 2020, PRRD signed The Bayanihan Heal as One Act (Republic Act 11469), giving him additional powers over the national budget and, when necessary, temporarily taking over companies and corporations. Through the Act, the Government can support the population below the poverty line who are profoundly affected by the pandemic [19].

1.2. COVID-19 in Iloilo, Philippines

Under the leadership of Governor Arthur R. Defensor, Jr., the Iloilo Provincial Government made a proactive response to the possible risks that COVID-19 might bring to the Province by issuing Executive Order No. 28 (EO No. 28) on January 23, 2020. EO No. 28 ordered strict

quarantine procedures and other disease prevention and control measures by securing the ports of entry for foreign vessels, local and international passengers, and by monitoring tourism establishments [22].

On March 20, 2020, Governor Defensor issued EO No. 80 that placed the entire Province under ECQ until April 14, 2020, which was in line with the issuance of ECQ by the National Government. Under the ECQ, strict home quarantine procedures were observed, whereby people were only allowed to go out of their residences to gather necessities and take care of health needs. Private establishments were closed except those providing necessities, health care, financial services, etc. [23]. The Provincial Government and the City Government, lead by Mayor Jerry Treñas, have issued and imposed several orders, ordinances, memorandums, resolutions, policies, and guidelines following EO No. 80 to protect the people of the Province and City of Iloilo from COVID-19.

The governments have implemented tight measures in surveillance of patients under investigation (PUI) and persons under monitoring (PUM) within the Province. PUIs are individuals with a history of exposure to COVID-19 (e.g., health care employees, close contact of a positive case, or a probable case) or have traveled to any place with positive cases or with issued travel restrictions. PUIs are those exhibiting symptoms, such as high fever ($\geq$38 °C), cough, fatigue, and other respiratory symptoms and are required to be admitted to the hospital. On the other hand, PUMs are individuals with a history of exposure to COVID-19 or have traveled to any place with positive cases or with issued travel restrictions but are not showing any symptoms. PUMs are required to undergo a 14-day quarantine [20].

Despite the efforts, some residents of the Province were infected by the virus. The first confirmed case was recorded on March 21, 2020, a 65-year old male from one of the municipalities in southern Iloilo. Since then, COVID-19 positive cases in the Province continue to increase. The Province and City of Iloilo have recorded 25 positive cases, five deaths, and four recoveries as of April 22, 2020.

Meanwhile, reports of discrimination directed at health care workers came to light. For example, health care workers at a hospital where a COVID-19 patient was confined were ostracized and evicted from their boarding houses. In addition, some were denied using a transportation system, were not allowed to buy food in grocery stores, and were barred from eating in food centers [24,25]. Similarly, residents of municipalities with confirmed local transmissions were also victims of discrimination; some were turned away by hospitals, while the house of the COVID-19 patients was stoned by their neighbors [26]. In addition, people have reacted negatively towards individuals associated with the disease due to anxiety caused by the increasing number of positive cases [26].

1.3. Information seeking among college students

College students seek information on various sources and formats, such as the Internet, social networking sites, print sources, mass media, professionals, family and friends and libraries, etc. [27]. Generally, an individual will use different information sources to answer a specific information need [28]. Moreover, as explained by Wilson's General Model of Information Behaviour, the information seekers' preference may vary depending on the need. It may be influenced by internal or external factors, such as psychological, demographic, role-related or interpersonal, environmental, and source characteristics [29]. Specifically, several studies have found that age, sex, income, discipline, position, environment, etc., have influenced information-seeking behavior [30,31]. Among the sources mentioned above, several studies have found that college students frequently use the Internet when seeking information for their everyday life [27,32], specifically for food and nutrition [33], financial information [34] and for their studies, as the Internet enabled them to save time and gave them access to the latest information [35]. Furthermore, college students have used the Internet when seeking health information [36,37]. Most college students perceived online health information as accurate and dependable as it

could provide them with various information [38]. While Bartlett et al. [98] found that college students could discern credible information sources such as scholarly books and journals, medical professionals and university and government websites, however, they do not use them since these sources are not readily available.

1.4. Information seeking in times of crisis

The COVID-19 pandemic has greatly impacted the health, economic conditions, and lifestyle of people worldwide. People are following the developments of the pandemic from various information channels. According to Lu [39]; an uncertain environment or unfavorable circumstances often triggers the need for a person to seek information. This allows them to gain adequate knowledge about a situation to make informed decisions, often not just for themselves but also to assist others. For instance, Majid & Rahmat [40] found that during the H1N1 virus outbreak, working adults and college students in Singapore sought information not just for their personal use to remain vigilant but also to help those looking for information. As a result, well-informed citizens were more inclined to adhere to protective measures [41] and were less fearful [42].

People seek information about precautionary actions to prevent infections or treatments if they get infected [40,43,44]. To satisfy their information needs, they used various information sources, such as social media, conventional mass media, and interpersonal channels [39,40, 43–45].

Since the advent of the Internet, people have regularly utilized non-conventional information channels such as social media when seeking information [40,44]. College students, in particular, are heavy users of social media. They use different social media platforms when seeking information [27,46–48,94] mainly to follow popular trends, find solutions and obtain other opinions [47]. Consequently, this heavy social media usage has caused problematic outcomes such as information overload and irrelevant, conflicting, outdated and noncredible information to the students' everyday life information-seeking [27].

For some, social media platforms like Facebook are an essential source of news [49]. This has gained importance as health organizations use social media platforms to communicate health-related information, especially when framing a pandemic as a general crisis [50]. However, since information sharing on social media is much easier than other media channels, there is also an opportunity to spread misinformation. Sharma et al. [49] found that among the public posts on Facebook about the Zika virus pandemic, misleading posts were more popular than posts containing relevant and accurate information. Choi et al. [51] found that individuals who are more exposed to news from social media about the MERS-CoV outbreak in South Korea were more likely to form risk perceptions. While Oh, Lee, and Han [52] have found that social media exposure was positively related to fear of MERS-CoV among Koreans.

Currently, people around the globe are seeking information about the pandemic by actively monitoring news to be informed about the status of the pandemic in the community and foresight of what is to come. In the Philippines, most Filipinos are paying attention to the developments in COVID-19, compared to other Asian countries such as Singapore, Hong Kong, and Vietnam [53]. Like most citizens in most Asian countries, Filipinos were feeling anxious about the pandemic [53]. The feeling of anxiety could be the effect of the information they have gathered, similar to what Zheng, Yao & Narayanan [54] found among the Chinese citizens during the COVID-19 outbreak in China. Alsubaie et al. [55] found that the common reasons for fear or worry during the MERS-CoV pandemic in Saudi Arabia were the high fatality rate and the absence of treatments or a vaccine. In addition, anxiety could lead to an individual's unfavorable behavioral responses to the pandemic [56]. According to Devakumar et al. [96], "[o]utbreaks create fear, and fear is a key ingredient for racism and xenophobia to thrive." As an example, there has been increased discrimination towards Chinese people following the COVID-19 outbreak in Wuhan, China. Similarly,

discrimination towards frontliners (e.g., medical or military personnel) and suspected COVID-19 infected individuals became prevalent in the Philippines [26]. Fear of an epidemic's grave effects may also lead people to take exaggerated precautionary actions to protect themselves or their loved ones [57], such as committing suicide after being suspected of a positive COVID-19 infection [58].

Because COVID-19 is relatively new, there are only a few documented research studies conducted on the topic. Thus, this online survey could help assess and track information about COVID-19. In addition, findings generated from this study will help guide and tailor information campaigns and ensure that the public, including college students, are well informed, thereby reducing the effect of COVID-19 on their mental and psychological well-being.

2. Research problem and methods

Generally, the study aimed to determine if the information-seeking behavior of the college students in the Province and City of Iloilo does affect their levels of knowledge, fear, and precautions to minimize their chance of infection by COVID-19. Specifically, it aimed to determine the:

(1) respondents' demographic characteristics in terms of age, sex, location, type of school, and year level;
(2) respondents' level of knowledge about COVID-19;
(3) respondents' precautionary actions to minimize the chance of infection by COVID-19, and their level of precautions;
(4) respondents' COVID-19 information-seeking behavior in terms of their primary, most believable, and most preferred sources of information;
(5) respondents' knowledge about COVID-19 cases in their locality;
(6) respondents' level of fear for themselves and their family members of infection by COVID-19;
(7) relationships between the respondents' demographic characteristics, level of precautions, information-seeking behavior, the presence or absence of COVID-19 cases in the locality, and their level of fear with their level of knowledge;
(8) relationships between the respondents' demographic characteristics, level of knowledge, information-seeking behavior, the presence or absence of COVID-19 cases in the locality, and their level of fear with their level of precautions; and;
(9) relationships between the respondents' demographic characteristics, level of knowledge, level of precautions, information-seeking behavior, and the presence or absence of COVID-19 cases in the locality with their level of fear.For numbered lists

The research is a cross-sectional survey that used a qualitative-quantitative method and snowball sampling technique. On March 25, 2020, the online survey instrument was posted on Facebook. Facebook was utilized because the post was shareable, and it could be forwarded through its Messenger application; hence it can facilitate snowball sampling. The survey ended on April 08, 2020. Two hundred twenty-eight (228) valid responses were gathered. Ethical approval was not sought since the study did not involve direct contact with the participants and did not utilize any identifiable data.

The researchers developed the structured survey instrument based on existing surveys on information-seeking behavior in times of crisis [39,43] modified to suit the local situation. The instrument was composed of close-ended questions (i.e., age; sex; location; type of school; year level; knowledge about COVID-19; knowledge about the existence of COVID-19 positive; the presence of PUI and PUM in their locality; precautionary measures; primary, most believable and their most preferred sources when seeking information about COVID-19; and their level of fear). Most of the questions were of yes/no type, except the level of fear that was determined using a 5-point Likert scale. In addition, for knowledge about COVID-19 and precautionary measures, the respondents were asked to enumerate all other information they know

about the pandemic and other preventive measures they were practicing that were not included in the checklists, respectively. Finally, answers to these questions were analyzed for thematic content.

The respondents' information-seeking behavior was identified by asking them their primary, most believable, and most preferred sources of information. The primary source of information is the source used when searching for COVID-19 information among the three broad categories of sources such as mass media, interpersonal channels, and social media. The primary source was being used by the respondents regardless if they find it to give the most believable information or not. Usage could be based on accessibility or on availability. While the most believable source of information is the source that the respondents deemed to give the most credible information about the pandemic among the three broad categories named above, and among the specific medium under each category. Under each category are specific information sources. The categorization of the specific sources was based on previous studies that were modified to adapt to the current Philippine setting. Lastly, the most preferred sources of information are the source that the respondents prefer to use when searching for COVID-19 information. Preferred source is mainly based on the respondents' preferences for various reasons.

The respondents' level of knowledge about COVID-19 was identified by asking them to acknowledge which information bits they knew about COVID-19 among the 12 information items provided. Seven of the choices were facts, while the other five were identified as myths by the [59]. Those who could identify all the facts without identifying any myth were given a perfect score of 12. A point was deducted in every fact missed or in every myth identified. The following scale that was based on the mean score (M = 9.44) of the respondents was used to determine their level of knowledge, 9 to 12 points ($\geq$ mean score) = High level of knowledge, 8 or lower points ($<$ mean score) = Low level of knowledge.

To identify the respondents' level of precautions, they were asked to identify all the precautionary actions that they were practicing among the 18 practices provided to minimize the chance of infection by COVID-19. A point was given to each practice identified. The following scale that was based on the mean score (M = 15.22) was used to determine their level of precautions, 15 to 18 points ($\geq$ mean score) = Very cautious; 14 or lower points ($<$ mean score) = Cautious.

A self-report measure of perceived fear was requested to identify the respondents' level of fear for themselves or their family member(s) of getting infected with COVID-19. The respondents were asked to self-report their level of fear using a five-point Likert Scale: 1 representing Not at all; 2 = Mild; 3 = Moderate; 4 = Severe; and 5 = Extreme. For relational analysis, the level of fear was re-grouped into a scale of three, such as 1 representing Mild/Not at all; 2 = Moderate; 3 = Extreme/Severe.

The data was processed using the Statistical Package for Social Sciences (SPSS) Version 21. Descriptive statistics, such as means with standard deviation (SD), frequency counts, and percentages, were used to describe the respondents' characteristics and the survey responses. While the relationships between the respondents' characteristics and their level of knowledge, level of precautions, and level of fear were examined using χ2. Statistical significance was set at p $\leq$ .05.

2.1. Limitations of the study

This study has its limitations. The cross-sectional survey design cannot infer causality and track changes over time. In addition, this study is limited to one Province and specific among college students only. It is also difficult to draw probability sampling in an online survey, limiting the generalizability of the results. Furthermore, regarding the information-seeking behavior of college students, the paper dealt specifically with the preferred sources when seeking COVID-19 information. Other aspects of information-seeking behavior are not covered in the study. Finally, this study was conducted a few months after the first COVID-19 outbreak in the Philippines and only a few days after the first

positive case in Iloilo Province was recorded. Hence, the information-seeking behavior, knowledge, precautionary measures, and level of fear might have changed over time. Therefore, the researchers advise caution when using and interpreting the findings of this study. Nevertheless, the present study has contributed to the limited but emerging research on Covid-19 among college students.

3. Results

3.1. Demographic profile of the college students in Iloilo

As presented in Table 1, the mean age was 20.7 (SD = 3.25) years, with an almost equal proportion of respondents between ages younger than 20 years old (48.7%) and ages older than 20 years old (51.3%). The age reflected the year level of the majority (58.3%) who were in their first year in college. The respondents were mostly females (63.2%), from Iloilo Province (62.7%), and were studying in private colleges or universities (57.5%). Since only four (1.8%) of the respondents preferred not to identify their sexes, this data was not included in the analysis to determine the relationships of sex to the following independent variables, levels of knowledge, precautions, and fear.

3.2. Knowledge about COVID-19

Since the COVID-19 outbreak in late December 2019, vast quantities of information have been published about the pandemic, especially on the Internet. On April 25, 2020, a Google search using the search term "COVID-19," yielded 6.62 billion results, while a Google Scholar search yielded 147,000 results. Other than these sources, thousands of bits of information are also available in different mass and social media channels. The wide array of information not only overwhelms but may confuse the information-seeker in identifying which information is true and which is false. Health organizations are publishing information about COVID-19 to combat the spread of fake news. For example, WHO published resources discussing facts [60] and myths [59] about COVID-19. These facts and myths were used as the basis to measure the knowledge of respondents about the disease (see Table 2). Items number one to seven are facts, while eight to twelve are myths.

Only one in every 10 (9.6%) respondents was able to identify all the facts and all the myths. The majority were aware that COVID-19 could be spread through small droplets from the nose or mouth (92.5%), that it is a disease caused by a virus (90.4%), and it poses a higher risk to older persons and persons with pre-existing medical conditions (90.4%). Only about six in every 10 respondents (58.3%) believed that there is currently no cure. In the open-ended question, several participants indicated the importance of proper hygiene (3.9%) and social distancing

Table 1
Profile of the respondents.

Profile	f	%
1. Age		
a. Younger than 20 years old	111	48.7
b. 20 years old or older	117	51.3
Mean = 20.07; SD = 3.15		
2. Sex		
a. Male	80	35.1
b. Female	144	63.2
c. Prefer not to say	4	1.8
3. Locality		
a. Iloilo City	85	37.3
b. Iloilo Province	143	62.7
4. Type of School		
a. Public College or University	97	42.5
b. Private College or University	131	62.7
5. Year		
a. First Year	133	58.3
b. Second Year or Higher	95	41.6

Table 2
Knowledge about COVID-19.

What is COVID-19?[a]	f	%
1. Can spread through small droplets from the nose or mouth	211	92.5
2. Disease caused by a virus	206	90.4
3. Older persons and persons with pre-existing medical conditions are at risk	206	90.4
4. Infectious or contagious disease	195	85.5
5. Deadly disease	179	78.5
6. A severe type of pneumonia	136	59.6
7. No medicine can prevent or cure	133	58.3
8. Can be detected by thermal scanners[b]	71	31.1
9. Cannot be transmitted in area areas with hot and humid climates[b]	51	22.4
10. Can be prevented by eating herbs/plants (e.g., garlic)[b]	49	21.5
11. Can be prevented by taking a hot bath[b]	39	17.1
12. Cannot infect children or healthy people[b]	20	8.8

[a] Multiple responses.
[b] Myth about COVID-19.

(5.2%) to control the spread of the virus. Meanwhile, 50.9% of the respondents believed at least one of the five myths about COVID-19. Specifically, some believed that thermal scanners could detect it (31.1%), it could be prevented by eating herbs/plants (21.5%) or by taking a hot bath (17.1%), but could not be transmitted in areas with hot and humid climates (22.4%), and could not infect children or healthy people (8.8%). While, in the open-ended question, seven (3.1%) respondents indicated a conspiracy belief that COVID-19 is a bioweapon.

Based on the respondents' ability to identify facts and myths about COVID-19, Table 3 shows that three-fourths (74.6%) of the respondents have a high level of knowledge about the COVID-19 pandemic with an overall mean knowledge score of 9.44 (SD = 1.72). The high level of knowledge could be associated with the fact that the respondents have used various information sources across all communication channels (see Table 6, item no. 6).

3.3. Precautionary actions undertaken to prevent COVID-19 infection

Disease outbreaks often stimulate people to take precautionary measures to prevent or minimize their chance of acquiring the disease. These measures include preventing themselves from getting involved in risky situations or performing activities that could strengthen or help them fight the risk [61]. Based on the data gathered, all the respondents reported doing at least one of the 18 precautionary measures indicated in Table 4. Almost all of the respondents were doing the following: staying at home (98.2%), avoiding a large gathering of people (96.5%), avoiding traveling using PUVs (96.5%), and frequent hand washing (96.1%). The majority also practiced the following: use of disinfectants (93.9%), minimizing visits to public places (93.4%), practicing social distancing (93.0%), avoiding shaking hands (89.9%), and avoiding sick people (89.5%). Regarding self-care, six of every 10 respondents were making sure that they get enough sleep (63.6%), eating a balanced diet (60.1%), and exercising regularly (56.1%). Table 5 shows that almost eight in every 10 respondents (78.9%) were very cautious in doing at least 15 of the 18 precautionary measures, with an overall mean of 15.22 (SD = 3.44).

3.4. Information-seeking behaviour – preferred sources

When threatened, an individual will often seek information to

Table 3
Level of knowledge about COVID-19.

Level	f	%
1. High (9–12 pts)	170	74.6
2. Low (≤ 8 pts)	58	25.4
Mean = 9.44; SD = 1.72		

Table 4
Precautionary actions undertaken.

Precautionary Actions[a]	f	%
1. Stays at home	224	98.2
2. Avoids large gathering of people	220	96.5
3. Avoids traveling using public utility vehicles (PUVs)	220	96.5
4. Washes hands more often	219	96.1
5. Disinfects hands more often	214	93.9
6. Limits going out to public places unless necessary	213	93.4
7. Practices social distancing	212	93.0
8. Avoids shaking hands	205	89.9
9. Avoids contact with sick people	204	89.5
10. Pays attention to cleanliness	203	89.0
11. Wears mask	201	88.2
12. Takes vitamins or herbal supplements	193	84.6
13. Avoids contact with people I do not know	184	80.7
14. Disinfects gadgets more often	180	78.9
15. Avoids longer person to person communication	168	73.7
16. Makes sure to get sufficient sleep	145	63.6
17. Eats a balanced diet	137	60.1
18. Exercises regularly	128	56.1

[a] Multiple responses.

Table 5
Level of precautions.

Level	f	%
1. Very cautious (15–18 pts)	180	78.9
2. Cautious (≤ 14 pts)	48	21.1
Mean = 15.22; SD = 3.44		

eliminate or to avoid the threat. Information is sourced from various channels, such as mass media and interpersonal channels, and recently from social media. Source preferences often vary depending on the need [39]. Table 6 presents the information-seeking behavior of the respondents, specifically on the sources of information they have used to satisfy their information needs regarding COVID-19. The majority (55.3%) of the respondents have identified mass media as their primary source of COVID-19 information, while 32% and 12.7% have identified social media and interpersonal channels. Only one in every 10 (12.7%) respondents preferred interpersonal channels that include health professionals. While social media is the preferred source of information among three in every 10 respondents (32%).

Almost eight in every 10 (78.9%) college students identified mass media as the most believable source, followed by interpersonal channels (17.1%). In comparison, only a few have identified social media (3.9%) as a believable source. Regarding interpersonal channels, the majority (74.1%) of the college students find medical personnel the most believable source compared to the LGU (23.7%) and their family members (1.8%). While among the mass media channels, college students find television (70.2%) the most believable source, far surpassing the Internet (20.2%) and radio (9.6%). When asked about the most believable source among social media channels, most respondents identified Facebook (41.7%) as the most believable, followed by Twitter (21.5%) and Instagram (2.6%).

The majority (85.5%) have preferred television as their source of COVID-19 information in terms of the most preferred sources. In addition, medical personnel (82%), LGU (81.6%), Facebook (67.5%), Internet (66.7%), radio (62.7%), and family members (55.3%) were also the preferred sources of information.

3.5. COVID-19 cases in the locality

On February 05, 2020, the DOH released guidelines on contact tracing for confirmed 2019 Novel Coronavirus Acute Respiratory Disease (2019-nCov ARD - the earlier name of COVID-19) cases [62]. Close contacts are individuals who may have been in contact with an infected

Table 6
Information-seeking behavior – preferred sources.

Sources of Information about COVID-19	f	%
1. Primary Source		
a. Mass media	126	55.3
b. Social media	73	32.0
c. Interpersonal channels	29	12.7
2. Most Believable Source		
a. Mass media	180	78.9
b. Interpersonal channels	39	17.1
c. Social media	9	3.9
3. Most Believable Interpersonal Channels		
a. Medical personnel	169	74.1
b. Local government unit (LGU) officers	54	23.7
c. Family members	4	1.8
d. Teachers	1	0.4
4. Most Believable Mass Media Channels		
a. Television	160	70.2
b. Internet	46	20.2
c. Radio	22	9.6
5. Most Believable Social Media Channels		
a. Facebook	95	41.7
b. Twitter	49	21.5
c. Blogs	41	18.0
d. YouTube or Vlogs	37	16.2
e. Instagram	6	2.6
6. Preferred Sources[a]		
a. Television	195	85.5
b. Medical personnel	187	82.0
c. LGU	186	81.6
d. Facebook	154	67.5
e. Internet	152	66.7
f. Radio	143	62.7
g. Family members	126	55.3
h. Twitter	80	35.1
i. Friends or classmates	76	33.3
j. YouTube or vlogs	71	31.1
k. Teachers	62	27.2
l. Blogs	58	25.4
m. Instagram	37	16.2

[a] Multiple responses.

person, and they may be classified as PUI or PUM. Since then, DOH national and regional offices have actively monitored the PUIs, PUMs, and COVID-19 positive cases. To increase awareness, the government regularly updates the public on the status of COVID-19 in the locality. In addition, the numbers and statuses of the close contacts are regularly communicated to the media and shared on various information channels. Other than the measures they are doing to curb the disease and the programs to ameliorate its economic impacts, data on the positive cases, recovery, and fatality rates were reported daily. On March 24, 2020, a day before our data gathering, there were 8994 PUMs, 75 PUIs, and one COVID-19 positive case in the Province and City of Iloilo [63]. The figures increased rapidly with 54,668 PUMs, 754 PUIs, and 38 COVID-19 positive cases [64] at the culmination of the survey on April 08, 2020. Table 7 shows that the majority (92%) of the respondents were aware of the presence or absence of PUMs/PUIs in their locality, while 89% knew about the presence or absence of confirmed positive case(s) that originated from their locality.

Table 7
Presence of COVID-19 cases in the locality.

COVID-19 Cases in Locality	f	%
1. PUIs or PUMs in Locality		
a. Yes	188	82.4
b. No	22	9.6
c. I don't know	18	7.9
2. COVID-19 Positive in/from the Locality		
a. Yes	102	44.7
b. No	101	44.3
c. I don't know	25	11.0

3.6. Level of fear

People feel fear when they face extremely uncertain situations such as danger or threat and find it hard to escape [65]. Several studies found that a public health crisis such as Ebola virus disease (EVD) [66], H1N1 [67], MERS-CoV [47] and SARS [68] have caused varying levels of fear among the people across different demographic and socioeconomic factors [69]. When threatened, an individual would usually choose to escape the threat [65] or support the authorities' precautionary measures to curb the risk [70]; Yang & Chu, 2016). As presented in Table 8, almost all (96.1%) of the respondents have felt at least a mild level of fear of the pandemic, 34.2% were moderately fearful, 21.1% were severely fearful, and 18.9% were extremely fearful. The mean level of fear was 3.3 (SD = 1.12).

3.7. Factors affecting college students' level of knowledge about COVID-19

The result of cross-tabulation analysis among variables and the respondents' level of knowledge about COVID-19 is summarized in Table 9. The p-value was obtained from Pearson's χ2 test. The cross-tabulation analysis revealed an almost equal level of knowledge among the respondents when grouped according to age, sex, location, type of school, year level, and knowledge about COVID-19 positive case in the locality. The result is further confirmed by χ2 tests indicating no significant relationships between the variables above and level of knowledge. Thus, the socio-demographic characteristics of college students cannot determine their level of knowledge about COVID-19 [93].

On the other hand, a high level of knowledge was observed among the respondents who did not believe in any COVID-19 myths, likewise among the respondents living in localities with PUIs or PUMs. However, only the belief or disbelief on any COVID-19 myths was significantly related to the level of knowledge (χ2 = 14.436, p = .000).

3.8. Information-seeking behavior and level of knowledge about COVID-19

As shown in Table 10, the cross-tabulation analysis revealed that a greater proportion of college students using mass media as their primary source of information about COVID-19 has a high level of knowledge than those using interpersonal channels social media. Nonetheless, the χ2 test (χ2 = 1.607, p = .448) revealed no significant relationship between primary sources of information and level of knowledge. On the other hand, the most believable source of information was significantly associated with the level of knowledge (χ2 = 8.487, p = .014).

In terms of preferred sources of COVID-19 information, χ2 tests revealed no significant differences in the respondents' level of knowledge who preferred all the identified sources except the Internet (χ2 = 6.116, p = .013) and YouTube or vlogs (χ2 = 7.008, p = .008). Thus, the results implied that respondents who preferred the Internet and YouTube or vlogs have a higher level of knowledge about the pandemic.

3.9. Factors affecting college students' level of precautions to minimize infection of oneself and family members with COVID-19

The relationship between the variables and the respondents' level of

Table 8
Level of fear of getting infected of COVID-19.

Level of Fear	f	%
1. Not at All	9	3.9
2. Mild	50	21.9
3. Moderate	78	34.2
4. Severe	48	21.1
5. Extreme	43	18.9

Mean = 3.3 (SD = 1.12).

Table 9
Relationship of the variables and the level of knowledge about COVID-19.

Variables	Level of Knowledge			χ2	df	p-value
	High (9–12 pts) N (%)	Low (≤8 pts) N (%)	Total N (%)			
1. Age						
younger than 20 years old	87 (78.4)	24(21.6)	111 (100.0)	1.662	1	.197
20 years old and older	83 (70.9)	34 (29.1)	117 (100.0)			
2. Sex						
Male	59 (73.8)	21 (26.3)	80 (100.0)	.104	1	.747
Female	109 (75.7)	35 (24.3)	144 (100.0)			
3. Location						
Iloilo City	63 (74.1)	22 (25.9)	85 (100.0)	.014	1	.906
Iloilo Province	107 (74.8)	36 (25.2)	143 (100.0)			
4. Type of School						
Public	69 (71.1)	28 (28.9)	97 (100.0)	1.046	1	.307
Private	101 (77.1)	30 (22.9)	131 (100.0)			
5. Year						
First Year	98 (73.7)	35 (26.3)	133 (100.0)	.129	1	.719
Second Year or Higher	72 (75.8)	23 (24.2)	95 (100.0)			
6. Believes Myths						
Yes	74 (63.8)	42 (36.2)	116 (100.0)	14.436	1	.000*
No	96 (85.7)	16 (14.3)	112 (100.0)			
7. PUI/PUM in the locality						
Yes	146 (77.7)	42 (22.3)	188 (100.0)	5.444	2	.066
No	13 (59.1)	9 (40.9)	22 (100.0)			
Not knowledgeable	11 (61.1)	7 (38.9)	18 (100.0)			
8. COVID-19 Positive in/from the locality						
Yes	79 (77.5)	23 (22.5)	102 (100.0)	3.163	2	.206
No	75 (74.3)	26 (25.7)	101 (100.0)			
Not knowledgeable	67 (64.0)	9 (36.0)	25 (100.0)			

* p-value is ≤ .05.

precautions is presented in Table 11. Greater proportions of the older respondents, male, with a high level of knowledge, and were aware of the presence or absence of PUI/PUM and COVID-19 positive in or from their locality, were found to be very cautious regarding infection by COVID-19. Nevertheless, χ2 tests showed no significant association between the variables mentioned above and the level of precautions. However, there was a significant relationship between the level of precautions and belief or disbelief in any COVID-19 myths (χ2 = 9.372, p = .002). This suggests that the college students who believed any COVID-19 myths were more cautious than those who did not.

3.10. Information-seeking behavior and level of precautions to minimize infection of oneself with COVID-19

The cross-tabulation in Table 12 indicated that although not statistically significant, the college students who preferred interpersonal channels as their primary and the most believable sources of COVID-19 information were found to be very cautious compared to those who preferred other channels. In terms of the most preferred sources of information, interpersonal channels such as medical personnel (χ2 = 9.714, p = .002), LGU (χ2 = 6.659, p = .010), and friends or classmates (χ2 = 4.275, p = .039) were found to be statistically related to the level of precautions of the respondents. Mass media such as the Internet ((χ2 = 4.275, p = .039) and radio (χ2 = 7.414, p = .006) were also found to be statistically related. The results suggest that COVID-19 information coming from medical personnel, LGU, friends or classmates, the Internet, and radio have influenced the respondents to become very cautious in their actions.

3.11. Factors affecting college students' level of fear of getting infected by COVID-19

Likewise, although not statistically significant, the respondents' level of fear varies depending on their age, location, type of school, year level, and belief or unbelief to COVID-19 myths (Table 13). The study results revealed that female respondents have significantly experienced more

severe or extreme levels of fear than the male respondents (χ2 = 12.674; p = .002) despite the fact that higher fatality rates were recorded among males than females who contract the virus [71]. Similarly, the knowledge about PUIs or PUMs in the locality (χ2 = 9.732; p = .045) and/or living in places were COVID-19 positive cases (χ2 = 10.577; p = .032) were recorded were significantly related to the higher level of fear. The increasing numbers of COVID-19 cases in the Province and City of Iloilo have caused anxiety and fear [26].

3.12. Information-seeking behavior and level of fear of getting infected by COVID-19

Table 14 presents cross-tabulation results between the sources of information and the respondents' level of fear. Data suggest that although not significantly related, higher proportions of the respondents who identified mass media as their primary and most believable sources of information have reported severe or extreme fear of getting infected by COVID-19. No significant relationships were found among preferred sources of information and level of fear, except for the respondents who preferred Facebook (χ2 = 6.720; p = .035) as their source of COVID-19 information. The result suggests that college students who preferred Facebook as a source of information have reported higher (severe or extreme) levels of fear.

4. Discussions

The survey was conducted when the number of COVID-19 cases in the Philippines was increasing. To keep the public well-informed about the pandemic and somehow lessen the citizens' feelings of fear, anxiety, and uncertainty about the situation [72], the government has been actively disseminating factual information. Moreover, the status of COVID-19 cases in the locality was regularly reported. This information dissemination about the pandemic is an essential response from the government since, according to Goh [73]; access to information about a particular health issue significantly affects the individual's level of knowledge. This is confirmed by the findings of the study, where the

Table 10
Relationship of the information-seeking behavior and level of knowledge about COVID-19.

Sources of Information	Level of Knowledge			χ2	df	p-value
	High (9–12 pts) N (%)	Low (≤8 pts) N (%)	Total N (%)			
1. Primary Source						
Interpersonal channels	21 (72.4)	8 (27.6)	29 (100.0)	1.607	2	.448
Mass media	98 (77.8)	28 (22.2)	126 (100.0)			
Social media	51 (69.9)	22 (30.1)	73 (100.0)			
2. Most Believable Source						
Interpersonal channels	23 (59.0)	16 (41.0)	39 (100.0)	8.427	2	.014*
Mass media	142 (78.9)	38 (21.1)	180 (100.0)			
Social media	5 (55.6)	4 (44.4)	9 (100.0)			
3. Preferred Sources[a]						
a. Television						
Yes	148 (75.9)	47 (24.1)	195 (100.0)	1.268	1	.260
No	22 (66.7)	11 (33.3)	33 (100.0)			
b. Medical personnel						
Yes	143 (76.5)	44 (23.5)	187 (100.0)	1.998	1	.157
No	27 (65.9)	14 (34.1)	41 (100.0)			
c. LGU						
Yes	139 (74.7)	47 (25.3)	186 (100.0)	.015	1	.901
No	31 (73.8)	11 (26.2)	42 (100.0)			
d. Facebook						
Yes	119 (77.3)	35 (22.7)	154 (100.0)	1.954	1	.162
No	51 (68.9)	23 (31.1)	74 (100.0)			
e. Internet						
Yes	121 (79.6)	31 (20.4)	152 (100.0)	6.116	1	.013*
No	49 (64.5)	27 (35.5)	76 (100.0)			
f. Radio						
Yes	103 (72.0)	40 (28.0)	143 (100.0)	1.298	1	.225
No	67 (78.8)	18 (21.2)	85 (100.0)			
g. Family members						
Yes	96 (76.2)	30 (23.8)	126 (100.0)	.394	1	.530
No	74 (72.5)	28 (27.5)	102 (100.0)			
h. Twitter						
Yes	65 (81.3)	15 (18.8)	80 (100.0)	2.907	1	.088
No	105 (70.9)	43 (29.1)	148 (100.0)			
i. Friends/Classmates						
Yes	61 (80.3)	15 (19.7)	76 (100.0)	1.954	1	.162
No	109 (71.7)	43 (28.3)	152 (100.0)			
j. YouTube or vlogs						
Yes	61 (85.9)	10 (14.1)	71 (100.0)	7.008	1	.008*
No	109 (69.4)	48 (30.6)	157 (100.0)			
k. Teachers						
Yes	49 (79.0)	13 (21.0)	62 (100.0)	.897	1	.343
No	121 (72.9)	45 (27.1)	166 (100.0)			
l. Blogs						
Yes	48 (82.8)	10 (17.2)	58 (100.0)	2.756	1	.097
No	122 (71.8)	48 (28.2)	170 (100.0)			
m. Instagram						
Yes	29 (78.4)	8 (21.6)	37 (100.0)	.339	1	.560
No	141 (73.8)	50 (26.2)	191 (100.0)			

* p-value is ≤ .05
[a] Multiple responses

majority of the respondents have shown a high level of knowledge about the pandemic. Knowledge, in turn, can influence an individual's adherence to protective measures [41]. However, a considerable proportion of the respondents has believed in COVID-19 myths. Health myths are misinformation that can lead people to take extreme precautionary measures that could endanger their health. It often flourishes during uncertain times when "the authorities are unable to provide confident explanations or advice" [74]. Some have even believed conspiracy beliefs, which are common during health crises or epidemics because it helps people explain away the things they cannot control [75]. Consequently, this could lead people to take a public health crisis lightly by not taking preventive actions or reducing policies.

The respondents took some precautionary measures to avert the infection, and the majority were very cautious. The results suggest that the respondents would avoid making contact with people they do not know; hence, they would avoid travel, large gatherings of people, and

when possible, would stay at home instead. These were found to be similar to the measures taken by people during the previous disease outbreaks such as SARS [43,61], Avian Influenza [76], and H1N1 [77]. However, the level of precautions of the respondents is much higher compared to the studies of other disease outbreaks [61,76,77], which may be related to the fact that COVID-19 has higher infection rate compared to other epidemics [6]. In addition, one study found that Generation Z individuals were more cautious than past generations [78].

The respondents have sourced information from various channels, such as mass media and interpersonal channels, and recently from social media to satisfy their information needs. Generally, mass media were found to be the primary source of information and were also considered to be the most believable source since it is more reliable and can deliver timely information [79]. However, interpersonal channels that include medical and government personnel was the least preferred primary source of information. The result reflects the current health system in the

Table 11
Relationship of the variables and the respondents' level of precautions.

Variables	Level of Precautions			χ^2	df	p-value
	Very Cautious (15–18 pts) N (%)	Cautious (≤14 pts) N (%)	Total N (%)			
1. Age						
younger than 20 years old	83 (74.8)	28 (25.2)	111 (100.0)	2.266	1	.132
20 years old and older	97 (82.9)	20 (17.1)	117 (100.0)			
2. Sex						
Male	67 (83.8)	13 (16.3)	80 (100.0)	1.982	1	.159
Female	109 (75.7)	35 (24.3)	144 (100.0)			
3. Location						
Iloilo City	67 (78.8)	18 (21.2)	85 (100.0)	.001	1	.972
Iloilo Province	113 (79.0)	30 (21.0)	143 (100.0)			
4. Type of School						
Public	79 (81.4)	18 (18.6)	97 (100.0)	.633	1	.426
Private	101 (77.1)	30 (22.9)	131 (100.0)			
5. Year						
First Year	102 (76.7)	31 (23.3)	133 (100.0)	1.424	2	.491
Second Year or Higher	78 (82.1)	17 (17.9)	95 (100.0)			
6. Level of Knowledge						
High	137 (80.6)	33 (19.4)	170 (100.0)	1.083	1	.298
Low	43 (74.1)	15 (25.9)	58 (100.0)			
7. Believes Myths						
Believes	101 (87.1)	15 (12.9)	116 (100.0)	9.372	1	.002*
Does not believe	79 (70.5)	33 (29.5)	112 (100.0)			
8. PUI/PUM in the locality						
Yes	147 (78.2)	41 (21.8)	188 (100.0)	2.448	2	.294
No	20 (90.9)	2 (9.1)	22 (100.0)			
Not knowledgeable	13 (72.2)	5 (27.8)	18 (100.0)			
9. COVID-19 Positive in/from the locality						
Yes	85 (83.3)	17 (16.7)	102 (100.0)	3.163	2	.206
No	78 (77.2)	23 (22.8)	101 (100.0)			
Not knowledgeable	17 (68.0)	8 (32.0)	25 (100.0)			

* p-value is ≤ .05.

Philippines, where a shortage of health professionals is prevalently minimizing the citizens' access to them [80]. Similar to previous studies (Yoo [51,81], some respondents also identified social media as their primary source of information despite being the least believable. The probable reason for this behavior is that Filipinos, mostly 18–24 years old, are one of the top Internet users worldwide and are spending at least 10 h per day online, primarily on social media [82]. Also, aside from being interactive, social media has been used by health organizations to disseminate health-related information [50]. Specifically, television is the most preferred source of COVID-19 information among all other sources since it is the most used and trusted media in the Philippines [82].

Almost all of the respondents felt fear of getting infected with COVID-19. The majority were moderate to severely fearful. The self-reported level of fear of the Filipino college students was higher compared to the Malaysians during the A(H1N1) outbreak [67], where the difference could be associated with the fact that COVID-19 is much more fatal [6]. This finding requires government or the least schools administrations' attention because several studies have found that some fearful individuals would respond negatively to the threat, such as the cases of some citizens of West African countries who did not report their family members infected by the EVD, which lead to the explosive spread of the virus [70], and of a man in India who had shown some COVID-19 symptoms, but because of the fear of infecting his loved ones, he took his own life [58].

Furthermore, results of the relational analyses revealed that several internal or external factors could influence the respondents' level of knowledge, level of precautions, and level of fear. For instance, the respondents who believed in COVID-19 myths have a low level of knowledge compared to those who did not believe in any myth. This is similar to what Abebe et al. [83] have found among the Ethiopian medical personnel who believed in misinformation about ebola virus disease (EVD) who showed a low level of knowledge about EVD.

Still, further, respondents' level of knowledge was also influenced by

the sources they used when seeking COVID-19 information. The respondents who identified mass media as the most believable source of information have a significantly high level of knowledge than those who identified interpersonal channels and social media. This contrasts with the findings of Koralek et al. [84] about the college students in the USA, who, although they mainly relied on mass media for EVD information, exhibited low levels of knowledge about the disease. The results revealed that the respondents who preferred the Internet and YouTube or vlogs have a higher level of knowledge about the pandemic. This result is consistent with Bawazir et al. [85] findings among Saudi Arabian Internet users that, although not significantly related, have a higher level of knowledge about MERS-CoV compared to those who rely on the other sources. Other than the Internet, no sources were associated with a high level of knowledge about EVD of the Americans [42]. A high level of knowledge of those using YouTube or vlogs agreed with the findings of the studies discussing the effectiveness of YouTube in increasing the awareness and interest of people, and its roles in educating and helping people make informed decisions on a particular emerging infectious disease like EVD [86], Zika [87], and COVID-19 [88].

Moreover, study results suggest that the respondents' demographics, level of knowledge, and the presence or the absence of COVID-19 cases in or from the locality did not significantly affect their level of precautions. The findings are supportive to the findings of Brug et al. [43]; stating that the sex, age, education, and level of knowledge of Dutch nationals did not significantly affect their precautionary actions during the SARS outbreak. However, it contradicts the findings of other public health emergency studies. For instance, de Zwart et al. [76] found that the age and educational level of Dutch nationals were associated with their preventive measures against avian influenza. Likewise, Jones and Salathe [57] found that age and gender were associated with the Americans' protective behavior against A(H1N1). On the contrary, the study found that belief or disbelief in COVID-19 myths significantly affects their level of precautions. Suggesting that the college students

Table 12
Relationship of the information-seeking behavior and the level of precautions of the respondents.

Sources of Information	Level of Precautions			χ2	df	p-value
	Very Cautious (15–18 pts) N (%)	Cautious (≤14 pts) N (%)	Total N (%)			
1. Primary Source						
Interpersonal channels	25 (86.2)	4 (13.8)	29 (100.0)	1.150	2	.563
Mass media	99 (78.6)	27 (21.4)	126 (100.0)			
Social media	56 (76.7)	17 (23.3)	73 (100.0)			
2. Most Believable Source						
Interpersonal channels	33 (84.6)	6 (15.4)	39 (100.0)	.909	2	.635
Mass media	140 (77.8)	40 (22.2)	180 (100.0)			
Social media	7 (77.8)	2 (22.2)	9 (100.0)			
3. Preferred Sources[a]						
a. Television						
Yes	155 (82.9)	32 (17.1)	187 (100.0)	.898	1	.232
No	21 (61.0)	16 (39.0)	41 (100.0)			
b. Medical personnel						
Yes	79 (81.4)	18 (18.6)	97 (100.0)	9.714	1	.002*
No	101 (77.1)	30 (22.9)	131 (100.0)			
c. LGU						
Yes	153 (82.3)	31 (23.3)	186 (100.0)	6.659	1	.010*
No	27 (64.3)	15 (35.7)	42 (100.0)			
d. Facebook						
Yes	122 (79.2)	32 (20.8)	154 (100.0)	.021	1	.884
No	58 (78.4)	16 (21.6)	74 (100.0)			
e. Internet						
Yes	126 (82.9)	26 (17.1)	152 (100.0)	4.275	1	.039*
No	54 (71.1)	22 (28.9)	76 (100.0)			
f. Radio						
Yes	121 (84.6)	22 (15.4)	143 (100.0)	7.414	1	.006*
No	59 (69.4)	26 (30.6)	85 (100.0)			
g. Family members						
Yes	103 (81.7)	23 (18.3)	126 (100.0)	1.327	1	.249
No	77 (75.5)	25 (24.5)	102 (100.0)			
h. Twitter						
Yes	66 (82.5)	14 (17.5)	80 (100.0)	1.827	2	.401
No	114 (77.0)	34 (23.0)	148 (100.0)			
i. Friends or classmates						
Yes	66 (86.8)	10 (13.2)	76 (100.0)	4.275	1	.039*
No	114 (75.0)	38 (25.0)	152 (100.0)			
j. YouTube or vlogs						
Yes	61 (85.9)	10 (14.1)	71 (100.0)	3.012	1	.083
No	119 (75.8)	38 (24.2)	157 (100.0)			
k. Teachers						
Yes	54 (87.1)	8 (12.9)	62 (100.0)	3.403	1	.065
No	126 (75.9)	40 (24.1)	166 (100.0)			
l. Blogs						
Yes	51 (87.9)	7 (12.1)	58 (100.0)	1.998	2	.368
No	129 (75.9)	41 (24.1)	170 (100.0)			
m. Instagram						
Yes	33 (89.2)	4 (10.8)	37 (100.0)	.787	1	.095
No	147 (77.0)	44 (23.0)	191 (100.0)			

* p-value is ≤ .05.
[a] Multiple responses.

who believed any COVID-19 myths were very cautious than their counterparts who did not. Misinformation about COVID-19 appears to cause an individual to become extremely cautious, or in the worst case, could result in actions detrimental to physical and mental health [89].

On the other hand, although not statistically significant, study results showed that interpersonal channels as the primary and most believable sources of COVID-19 information have caused college students to be very cautious compared to those who preferred other channels. In fact, interpersonal channels such as medical personnel, LGU officials, and friends or classmates as the most preferred sources of information have statistically caused the respondents to be very cautious. Thus, the results concurred with Snyder and Rouse's [95] findings on the influence of interpersonal channels on the behavioral change of persons at risk. Meanwhile, mass media such as the Internet and radio were also statistically related to the respondents' level of precautions. These results confirm Rogers Diffusion of Innovation Theory [90], which states that mass media are more effective in spreading knowledge about preventive

behaviors while interpersonal channels are more effective in changing attitudes towards preventive action.

The severity of the COVID-19 has caused confusion, anxiety, and fear among the people. However, its psychosocial effects vary across sociodemographic groups. For instance, alcohol use and levels of anxiety and depression of Chinese citizens during the COVID-19 pandemic varied significantly according to location, gender, and age [91]. Similarly, although not statistically significant, the respondents' level of fear of COVID-19 differs depending on their age, location, type of school, year level, and belief or unbelief to COVID-19 myths. In contrast, female respondents were statistically fearful than male respondents, even though higher fatality rates were recorded among males than females contracting the virus [71]. Interestingly, females were more fearful of being vulnerable to COVID-19 than males [69]. Additionally, the respondents who were aware of probable and confirmed COVID cases in their localities showed a statistically higher level of fear, which was also observed among health workers in Sierra Leone during the EVD

Table 13
Relationship of the variables and the respondents' level of fear of getting infected by COVID-19.

Variables	Level of Fear				χ2	df	p-value
	Extreme/Severe N (%)	Moderate N (%)	Mild/Not at all N (%)	Total N (%)			
1. Age							
younger than 20 years old	46 (41.4)	39 (35.1)	26 (23.4)	111 (100.0)	.684	2	.710
20 years old and older	45 (38.5)	39 (33.3)	33 (28.2)	117 (100.0)			
2. Sex							
Male	21 (26.3)	28 (35.0)	31 (38.8)	80 (100.0)	12.674	24	.002*
Female	67 (46.5)	49 (34.0)	28 (19.4)	144 (100.0)			
3. Location							
Iloilo City	30 (35.3)	27 (31.8)	28 (32.9)	85 (100.0)	3.575	2	.167
Iloilo Province	61 (42.7)	51 (35.7)	31 (21.7)	143 (100.0)			
4. Type of School							
Public	42 (43.3)	35 (36.1)	20 (20.6)	97 (100.0)	2.462	2	.292
Private	49 (37.4)	43 (32.8)	39 (29.8)	131 (100.0)			
5. Year							
First Year	49 (36.8)	49 (36.8)	35 (26.3)	133 (100.0)	1.424	2	.491
Second Year or Higher	42 (44.2)	29 (30.5)	24 (25.3)	95 (100.0)			
6. Level of Knowledge							
High	68 (40.0)	62 (36.8)	40 (23.5)	170 (100.0)	2.423	2	.298
Low	23 (39.7)	16 (27.6)	19 (32.8)	58 (100.0)			
7. Believes Myths							
Believes	49 (42.2)	32 (27.6)	35 (30.2)	116 (100.0)	5.034	2	.081
Does not believe	42 (37.5)	46 (41.1)	24 (21.4)	112 (100.0)			
8. Level of Precautions							
Very cautious (16–18 pts)	72 (40.0)	62 (34.4)	46 (25.6)	180 (100.0)	0.50	2	.976
Cautious (15 pts or lower)	19 (39.6)	16 (33.3)	13 (27.1)	48 (100.0))			
9. PUI/PUM in the locality							
Yes	80 (42.6)	62 (33.0)	46 (24.5)	188 (100.0)	9.732	4	.045*
No	8 (36.4)	5 (22.7)	9 (40.9)	22 (100.0)			
Not knowledgeable	3 (16.7)	11 (61.1)	4 (22.2)	18 (100.0)			
10. COVID-19 Positive in/from the locality							
Yes	44 (43.1)	27 (26.5)	31 (30.4)	102 (100.0)	10.577	4	.032*
No	40 (39.6)	36 (35.6)	25 (24.8)	101 (100.0)			
Not knowledgeable	7 (28.0)	15 (60.0)	3 (12.0)	25 (100.0)			

* p-value is ≤ .05.

outbreak [97].

Finally, though not statistically significant, higher proportions of respondents who identified mass media as their primary and most believable source of information had experienced severe or extreme fear of contracting COVID-19. There were no significant connections between preferred sources of information and level of fear, except for Facebook. Fear levels were higher (severe or extreme) among college students who preferred Facebook as a source of COVID-19 information. This validates findings of studies on the adverse effects of social media on the mental and psychological well-being of individuals facing threats caused by epidemics, such as worry, depression, anxiety, anger and fear [16,52]; [55]. Furthermore, the results regarding the positive associations of the level of fear with the presence of COVID-19 related cases in the locality and preference for Facebook as a source of information confirmed the findings of Ni et al. [16]; stating that people who were living close to individuals with COVID-19 and are using social media regularly were experiencing anxiety and depression.

5. Conclusions and recommendations

In summary, in Iloilo, Philippines, college students were well-informed about the severe consequences of COVID-19, a highly contagious and deadly disease. However, their fear levels are influenced by the information they have gathered. COVID-19 cases in their localities and myths and misinformation from various sources, especially Facebook, are the most significant influences. Notably, they fear not only for themselves but also for their family members. As a result, they performed various precautionary measures to avert infection.

The study confirmed the negative effect of COVID-19 on college student's mental health, highlighting the need for urgent attention by the educational institutions in the country. In agreement with Cao et al. [15] recommendations, schools should offer crisis-oriented programs that would support the students' psychological well-being. Since school openings will be delayed due to the pandemic, educational institutions should utilize various information channels that the students highly prefer, such as television, Facebook, the Internet, and radio. Additionally, schools should collaborate with government agencies and/or medical personnel for their health promotion programs. To reach and better educate the students, schools should exploit the Internet and YouTube or vlogs that were found to be related to a high level of knowledge. To help students reduce fear, an information literacy program that would teach them to identify the difference between true and misinformation is essential.

Considered as the college students' primary, most believable, and most preferred sources of information, mass media could intensify their information dissemination activities by providing breaking news about the pandemic and by propagating reliable and credible facts that could educate and reduce people's fear. In addition, mass media must continue to connect and utilize social media (Facebook, Twitter, etc.) and other communication outlets to have a broader scope of dissemination.

Further research to investigate the impacts of the COVID-19 pandemic on Filipino college students' mental and psychological well-being is recommended. Likewise, the influence of their information-seeking behavior on their mental and psychological state is also essential.

Table 14

Relationship of the information-seeking behavior and the respondents' level of fear of getting infected by COVID-19.

Sources of Information	Level of Fear				χ2	df	p-value
	Extreme/Severe N (%)	Moderate N (%)	Mild/Not at All N (%)	Total N (%)			
1. Primary Source					6.068	4	.194
Interpersonal channels	11 (37.9)	13 (44.8)	5 (17.2)	29 (100.0)			
Mass media	57 (45.2)	36 (28.6)	33 (26.2)	126 (100.0)			
Social media	23 (31.5)	29 (39.7)	21 (28.8)	73 (100.0)			
2. Most Believable					3.579	4	.466
Interpersonal channels	12 (30.8)	15 (38.8)	12 (30.8)	39 (100.0)			
Mass media	76 (42.2)	61 (33.9)	43 (18.9)	180 (100.0)			
Social media	3 (33.3)	2 (22.2)	4 (44.4)	9 (100.0)			
3. Preferred Sources[a]							
a. Television					5.781	2	.056
Yes	84 (43.1)	64 (32.8)	47 (24.1)	195 (100.0)			
No	7 (21.2)	14 (42.4)	12 (36.4)	33 (100.0)			
b. Medical personnel					.887	2	.642
Yes	76 (40.6)	65 (34.8)	46 (24.6)	187 (100.0)			
No	15 (36.6)	13 (31.7)	13 (31.7)	41 (100.0)			
c. LGU					2.782	2	.249
Yes	77 (41.4)	59 (31.7)	50(26.9)	186 (100.0)			
No	14 (33.3)	19 (45.2)	9 (21.4)	42 (100.0)			
d. Facebook					6.720	2	.035*
Yes	70 (45.5)	50 (32.5)	34 (22.1)	154 (100.0)			
No	21 (28.4)	28 (37.8)	25 (33.8)	74 (100.0)			
e. Internet					1.834	2	.400
Yes	65 (42.8)	51 (33.3)	36 (23.7)	152 (100.0)			
No	26 (34.2)	27 (35.5)	23 (30.3)	76 (100.0)			
f. Radio					3.884	2	.143
Yes	64 (44.8)	46 (32.2)	33 (23.1)	143 (100.0)			
No	27 (31.8)	32 (37.6)	26 (30.6)	58 (100.0)			
g. Family members					2.097	2	.350
Yes	54 (42.9)	38 (30.2)	34 (27.0)	126 (100.0)			
No	37 (36.3)	40 (39.2)	25 (24.5)	102 (100.0)			
h. Twitter					1.827	2	.401
Yes	36 (45.0)	27 (33.8)	17 (21.3)	80 (100.0)			
No	55 (37.2)	51 (34.5)	42 (28.4)	148 (100.0)			
i. Friends/classmates					1.435	2	.488
Yes	33 (43.4)	27 (35.5)	16 (21.1)	76 (100.0)			
No	58 (38.2)	51 (33.6)	43 (28.3)	152 (100.0)			
j. YouTube or vlogs					.642	2	.725
Yes	29 (40.8)	26 (36.6)	16 (22.5)	71 (100.0)			
No	62 (39.5)	52 (33.1)	43 (27.4)	157 (100.0)			
k. Teachers					2.333	2	.311
Yes	25 (40.3)	25 (40.3)	12 (19.4)	62 (100.0)			
No	66 (39.8)	53 (31.9)	47 (28.3)	166 (100.0)			
l. Blogs					1.998	2	.368
Yes	26 (44.8)	21 (36.2)	11 (19.0)	58 (100.0)			
No	65 (38.2)	57 (33.5)	48 (28.2)	170 (100.0)			
m. Instagram					2.651	2	.266
Yes	15 (40.5)	16 (43.2)	6 (16.2)	37 (100.0)			
No	76 (39.8)	62 (32.5)	53 (27.7)	191 (100.0)			

* p-value is $\leq$ .05.

[a] Multiple responses.

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