Impact of Educational Leaflet Dissemination on University Students’ Knowledge, Attitude, and Practice toward COVID-19 in Indonesia

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Introduction

The coronavirus disease-19 (COVID-19) pandemic has become a public health problem at the global level [1]. Since the first cases of COVID-19 were detected in Indonesia on March 2, 2020, the number of cases and deaths is still rising recently. As of March 4, 2022, more than 440 million COVID-19 cases were reported worldwide, while more than 5.6 million were from Indonesia [2]. The Indonesian government has imposed measures to control the disease transmission, including the implementation of large-scale social distancing, increasing the capacity of COVID-19 diagnostic testing, and enforcing the tracing efforts [3]. Governments also carried out educational initiatives along with journalists and the media industry to raise people’s awareness of COVID-19 [3].

Although much information related to COVID-19 was readily available, the public might perceive that COVID-19 was not a serious disease. During the early phase of the COVID-19 outbreak, many scientific terminologies were introduced through mass media, creating confusion among the public. Besides, some hoaxes were rapidly disseminated through social media, causing false preventive practices [3]. Increasing public health literacy may effectively reduce the spread of infectious diseases, including COVID-19. Health literacy has an essential meaning in improving the prevention and control of infectious diseases, while knowledge, attitudes, and practice (KAP) is essential components of health literacy [4].

KAP for certain infectious diseases can be influenced by the severity of the disease, the transmission rate, and the death rate. KAP toward COVID-19 has also developed until this day [5]. Public understanding of COVID-19 reflects a correlation between the depth of their knowledge and information available in both literature and media [6]. Meanwhile, attitude and practice aspects generally reflect appropriate precautions, compliance with new rules during a pandemic, and what to do if contracting COVID-19 [5]. Therefore, research on KAP related to COVID-19 is vital to explore public perceptions of the attributes that influence their behavior, which is useful for determining interventions in the form of preventive strategies and health promotion related to COVID-19 [7], [8].

Abstract

BACKGROUND: The COVID-19 pandemic has become a public health problem at the global level. Knowledge, attitude, and practice (KAP) toward COVID-19 has an essential role in improving the prevention and control of infectious diseases. University students are expected to have positive knowledge, attitudes, and practice toward COVID-19 not only for themselves but also for their community.

METHODS: A one-group pretest-posttest study was conducted on undergraduate students at Universitas Andalas, Indonesia, from October 2020 to January 2021 to explore the impact of an educational leaflet on university students’ KAP toward COVID-19.

RESULTS: An amount of 407 students participated in this study. Most of the participants were female (N = 308; 75.68%), aged 20 years and above (N = 251; 61.67%), and were non-health professional students (N = 337; 82.80%). Female students had significantly better knowledge, while female and health sciences students had better preventive practice related to COVID-19. The median KAP scores were retained after the intervention. After the intervention, only attitude scores significantly differed from the pre-intervention score (p = 0.004), yet the scores were lower.

CONCLUSION: The educational leaflet is not effective in improving students’ KAP toward COVID-19. Careful design of the educational method is needed to improve university students’ KAP.
University students tend to have higher autonomy. They are engaged in many activities that make them frequently in contact with others. These characteristics are among the importance of analyzing the KAP of students [9], [10]. University students also have an important role as information providers for their families and surrounding communities [11]. Thus, student education is expected to positively impact knowledge, attitudes, and behavior toward COVID-19 not only for themselves but also for their community.

Although many studies have been conducted about the KAP of university students toward COVID-19 in different countries, very few studies have been published about the impact of an educational intervention to improve the KAP. The digital educational leaflet is one of the media that can be used for health promotion purposes, as it can reach a wide audience [12], [13]. Therefore, this study aimed to explore the association between educational leaflets and university students’ KAP toward COVID-19.

Materials and Methods

Study design

A one-group pretest-posttest study was conducted on undergraduate students at Universitas Andalas, Indonesia, in 2020. The inclusion criteria were undergraduate students from any class year and faculty who agreed to participate in this study and filled out the informed consent form. The minimum sample size was calculated at a confidence interval level of 5% and a degree of error of 5%, resulting in 384 samples. The predictive sample size was then added by 10%, resulting in 422 samples in total to accommodate a low response rate.

Questionnaire

An instrument was developed to measure the KAP of university students toward COVID-19. This instrument was adapted from several studies [5], [14] and adjusted to the Indonesian context (Table 1). The validity test of the instrument was performed using a correlation test, while the reliability test was performed using Cronbach alpha. Only question items with an r coefficient >0.3 were included in the questionnaire. The Cronbach alpha value for the questions was 0.717 that considered reliable.

The questionnaire assessing knowledge consists of seven items, as described in Table 1. The participants were asked to choose whether each statement was true or false. Except for the K6 and K7, “true” answers were considered correct. At the time, when this study was conducted, other antivirals and antibiotics were still the mainstays of COVID-19 treatment. Meanwhile, the COVID-19 vaccine had not passed clinical trials [15]. Every correct answer was scored 1, and the wrong answer was scored 0. Thus, the maximum score would be 7.

Questionnaire items for attitude consist of four items with a 5-point Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree). The seven-question items of practice also had a 5-point Likert scale related to frequency (always, often, sometimes, seldom, and never). The maximum score for attitude was 20, while for practice was 35. Then, the scores for KAP were classified into three categories: Good (>75%), moderate (50–75%), and poor (<50%).

The pre-intervention survey was administered using the Google Forms® platform. Two months after the pre-intervention survey was administered, an educational leaflet was delivered to students using an online messenger application (WhatsApp®). The education leaflet consists of the symptoms, preventive measures, and advice for people who feel common symptoms of COVID-19. The post-intervention survey was administered 2 weeks after the intervention.

Statistical methods

Demographic data were analyzed descriptively. From the normality test using Kolmogorov–Smirnov, the KAP scores were not normally distributed (p<0.05). The difference in KAP scores distribution according to the sociodemographic characteristics was analyzed using the Chi-square test. The difference in KAP scores before and after the intervention was analyzed using Wilcoxon signed-rank test.
Ethical approval

This study obtained ethical approval from the Research Ethics Committee, Faculty of Medicine, Universitas Andalas, Indonesia (No. 186/UN.16.2/KEP-FK/2020).

Results

Four hundred and seven students participated in this study. Most of the participants were female (N = 308; 75.68%), aged 20 years and above (N = 251; 61.67%), and were non-health sciences students (N = 337; 82.80%), as described in Table 2.

Table 2: Sociodemographic characteristics of participants

| Participants' characteristics | N (%) |
|------------------------------|-------|
| Gender                       |       |
| Female                       | 308 (75.68) |
| Male                         | 99 (24.32)  |
| Age                          |       |
| < 20                         | 156 (38.33) |
| 20–22                        | 233 (57.25) |
| > 22                         | 18 (4.42)   |
| Faculty                      |       |
| Health sciences              | 70 (17.20)  |
| Non-health sciences          | 337 (82.80) |

At the baseline, most of the students showed good knowledge (N = 398, 97.8%), good attitude (N = 359, 88.2%), and good practice (N = 264, 64.9%) toward COVID-19 (Table 3). More than one-third of participants had a moderate level of preventive practices related to COVID-19. The mean score for KAP was 6.22 ± 0.810, 16.83 ± 2.006, and 28.17 ± 4.066, respectively.

Table 3: KAP profile of participants before the intervention

| Variable          | N | Percentage |
|-------------------|---|------------|
| Knowledge         |   |            |
| Good              | 398 | 97.8      |
| Moderate          | 7  | 1.7        |
| Poor              | 2  | 0.5        |
| Attitude          |   |            |
| Good              | 359 | 88.2      |
| Moderate          | 47  | 11.5       |
| Poor              | 1  | 0.2        |
| Practice          |   |            |
| Good              | 264 | 64.9      |
| Moderate          | 142 | 34.9      |
| Poor              | 1  | 0.2        |

Table 4 shows the KAP profile according to the sociodemographic characteristics. Female participants had better knowledge (p = 0.037) and better practice (p = 0.000) than male participants. It is also evident that students from health sciences majors had better practice compared to their fellows from non-health sciences disciplines (p = 0.006). There was no difference in KAP across different age groups.

From Table 5, it was evident that the proportion of participants who possessed good knowledge was unchanged after the intervention, which was 97.8% (N=398). Meanwhile, more participants had a good attitude (91.9% vs. 88.2%) and good practice (79.4% vs. 64.9%) than before (Table 3). Yet, more participants had poor attitudes (8.1% vs. 0.2%) and poor practices (2.2% vs. 0.2%) after the intervention compared to before the intervention.

It is also evident that the mean score of knowledge and attitude after educational intervention was slightly lower than before the intervention (6.14 ± 0.799 and 16.48 ± 2.059, respectively). In contrast, the mean practice score after the intervention was higher than the practice score before the intervention (Table 6). On the other hand, the median of KAP was retained after the intervention. Only the interquartile range of post-intervention attitude score was greater than pre-intervention, while the IQR of the knowledge and practice score was unchanged. After the further analysis was conducted, only students’ attitudes between pre- and post-intervention were significantly different (p = 0.004), as shown in Table 6. However, it seems that the attitude score was slightly lower, so the difference could not be seen as an improvement. It suggested that the educational leaflet dissemination was ineffective in improving students' KAP related to COVID-19.

Discussion

As described in Table 2, most of the participants are female, aged 20 years and above, and belong to non-health sciences majors. The gender proportion reflected the actual proportion of female and male undergraduate students at Universitas Andalas. In 2020, female undergraduate students were also greater than male students (13,993 and 9834, respectively) [16].

The typical university students in Indonesia started their undergraduate education at 18 [17]. As the
undergraduate program requires 4 years to complete, the students are expected to graduate at 22. Sometimes, students need longer time to complete their studies, which explain the small proportion of participants aged 22 years and above.

Table 5: KAP profile of participants after the intervention

| Variable   | N     | Percentage |
|------------|-------|------------|
| Knowledge  |       |            |
| Good       | 398   | 97.8%      |
| Moderate   | 3     | 0.7%       |
| Poor       | 6     | 1.5%       |
| Attitude   |       |            |
| Good       | 374   | 91.9%      |
| Moderate   | 0     | 0.0%       |
| Poor       | 33    | 8.1%       |
| Practice   |       |            |
| Good       | 323   | 79.4%      |
| Moderate   | 75    | 18.4%      |
| Poor       | 9     | 2.2%       |

Table 6. The differences between KAP scores (pre- and post-intervention)

| Variable   | Pre-intervention | Post-intervention | p   |
|------------|------------------|-------------------|-----|
| Knowledge  | Mean ± SD        | 6.22 ± 0.810      | 6.14 ± 0.799 | 0.057 |
|            | Mean ± SD        | 6               | 6     |
|            | Interquartile range | 6–7             | 6–7   |
| Attitude   | Mean ± SD        | 16.83 ± 2.006     | 16.48 ± 2.059 | 0.004* |
|            | Mean ± SD        | 17               | 17    |
|            | Interquartile range | 16–18           | 15–18 |
| Practice   | Mean ± SD        | 28.17 ± 4.066     | 28.51 ± 4.738 | 0.056 |
|            | Mean ± SD        | 29               | 29    |
|            | Interquartile range | 26–31           | 26–32 |

KAP: Knowledge, attitude, and practice.

When this study was conducted, there were 15 faculties at Universitas Andalas [18]. Only five of them belong to health sciences, which are medicine, pharmacy, nursing, public health, and dentistry. At the same time, the rest of faculties are not related to health sciences (e.g., animal science, engineering, and economics). Thus, non-health sciences students who participated in this study had larger proportions than health sciences students.

At the baseline, most of the students showed good knowledge (N = 398, 97.8%), good attitude (N = 359, 88.2%), and good practice (N = 264, 64.9%) toward COVID-19. The mean score for KAP was 6.22 ± 0.810, 16.83 ± 2.006, and 28.17 ± 4.066, respectively. This finding is consistent with the previous studies in China, India, Saudi Arabia, and Jordan, which reported that students had appropriate knowledge, positive attitudes, and proactive practice [5], [10], [19], [20]. Other studies in Pakistan found that despite having good knowledge and attitude, most students did not have good preventive practices related to COVID-19. This phenomenon raised concern since the educated population was expected to have a good practice. If the health sciences students had poor practice related to COVID-19, people who have limited access to information might have inadequate KAP as well [21].

Female participants had better knowledge than males (p = 0.037). This finding is similar to the previous studies in Japan and a study on medical students in Indonesia, which suggested female gender positively influences the knowledge related to COVID-19 [9], [22]. One possible explanation for the findings is that women want more disease prevention information than men [23].

Besides, female participants and health sciences students also had better practice (p < 0.05). This result is also aligned with the previous studies in Malaysia [19], [24], [25]. Women have more likelihood to practice preventive behaviors related to respiratory pandemics [26]. Meanwhile, health students have better practices because they learn about preventive behaviors during their formal education [27].

The previous studies on KAP of university students suggest the importance of education, information, and communication strategies to improve students’ KAP [21], [25], [28]. Some studies also proposed methods such as health campaigns through social media, posters, and phone messages to enhance the KAP of the students [21], [29]. Thus, in this study, we tried to employ an educational leaflet delivered through WhatsApp to improve the students’ KAP related to COVID-19.

Despite the greater proportion of participants who had a good attitude and practice after disseminating educational leaflets, there was no significant difference in students’ knowledge and practice after the intervention. Students’ attitudes after the intervention were significantly different (p<0.05), yet they tended to be lower than before the intervention. This result suggested that educational leaflets may not be effective in improving students’ KAP. A study conducted in Indonesia suggested that other educational methods were more suitable than informational leaflets. A community-based education significantly improves public knowledge and attitude compared to informational leaflets [30]. Other studies also showed that presentation and audio-visual media improve knowledge, either as an alternative or combined with leaflets [13], [31], [32].

One of the reasons for the absence of improvement in KAP after the dissemination of leaflets is the possible overload of leaflets or information that participants received. Compared to a poster that stays in one place for a long time, leaflets may not allow long-term knowledge retention and positive attitudes [12]. There was a 2-week gap between the leaflet dissemination and the post-test survey in this study. This gap makes the intended effect of the educational leaflet was not observed in this study.

Another reason is explained by a previous study that explores the public adoption of COVID-19 information. This study combines two existing theories about using the information to prevent disease: The information adoption model (IAM) and the health belief model (HBM). According to the IAM model, the usefulness of information mediates the influence of processes and information adoption [33]. Meanwhile, the HBM core concept is that the action depends on the perceptions of benefits and barriers related to...
health behavior. HBM comprises six tenets, including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action, and self-efficacy. If the perception of benefits outweighs the barrier perception, encouraged by a cue to action and self-efficacy, the behavior will likely change [34]. According to this study, it is essential to improve the quality of information available and the capability to get information to fight false news and save lives [35].

Despite our inability to suggest an effective educational method to improve the students’ knowledge and practice related to COVID-19, this study was one of the few studies exploring educational approaches for undergraduate students in Indonesia. We would recommend that the educational method be designed appropriately, considering the media, frequency, and duration to deliver information regarding COVID-19.

**Conclusion**

The students generally had good KAP toward COVID-19. Female was associated with good practice. The educational leaflet is not effective in improving students’ KAP toward COVID-19.

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