

## Research Article

# Implementation of Internet-Based Technology in Primary Health Care During the COVID-19 Pandemic

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**Abstract.** Primary health care services in Indonesia are facing challenges in dealing with the COVID-19 pandemic. Many primary health services are limited as a result of the lockdown policy, which can prevent people who are experiencing health difficulties from seeking assistance. This study aimed to examine the implementation of internet-based technology in the primary health care sector for COVID-19 prevention. An experimental two-group pretest-posttest design was used. Respondents were offered an intervention in the form of internet-based instruction in five sessions (each meeting lasting 45 minutes) over three weeks; these sessions involved talks with PowerPoint presentations and applications regarding COVID-19 prevention. The level of knowledge about COVID-19 prevention grew considerably between the pre- and post-intervention periods, from 3.02 (SD = 1.25) to 4.45 (SD = 1.31), with a p-value < 0.001, while there was no significant decline in the control group (p = 0.260). Health monitoring systems are used to examine data gathered over the course of implementing a health program for patients. The implementation of this program resulted in an increase in the knowledge and abilities of health workers regarding the use of technology. Training to boost health workers' capacity for technology use is urgently needed and should be implemented across all facility health workers.

**Keywords:** internet of things, primary health care, COVID-19

## 1. Introduction

Currently, Indonesia and the rest of the world are combating the COVID-19 outbreak, which has claimed countless lives. COVID-19 is a virus that infects the human respiratory system and is spread via droplets of air [1]. Indonesia has the ninth highest number of COVID-19 patients in the world. As of October 27, 2020, there were 392,934 COVID-19 patients in Indonesia, with a mortality toll of 13,411 [2]. There are more COVID-19 cases in West Java's West Bandung Regency than everywhere else, particularly in densely inhabited and industrial districts [4]. Batujajar sub-district has the greatest number of confirmed COVID-19 cases in West Bandung district. There were 29 confirmed positive cases, with the most serious being 67 asymptomatic confirmed positive cases [5]. Due

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to the high number of positive cases without symptoms, it is difficult to break the chain of transmission and to trace or trace contacts in order to identify possible virus spread. The pattern of COVID-19 transmission changed very quickly; at the start of this outbreak, it was discovered in Indonesia that transmission occurred from foreigners to local residents, then local transmission occurred with the formation of several family clusters, and finally clusters formed in factories. Clusters of COVID-19 transmission were also developed in numerous garment manufacturers in the Batujajar industrial district, resulting in the closure of several enterprises and transmission to families (family clusters) [5].

Indonesian primary health services like Puskesmas, Poskesdes, and Posyandu need to be improved. Particularly concerning service quality (Good Clinical Governance), which has remained inadequate and has not operated at peak efficiency up to this point. This affects the unequal distribution of health care, especially in rural areas far from hospitals. Indeed, the presence of Primary Care institutions like as Puskesmas, Poskesdes, and Posyandu is their only hope of survival. This service problem at the primary level is escalating as a result of the COVID-19 outbreak; many puskesmas have restricted services as a result of the lockdown policy, which prevents people with health problems from seeking assistance. And even the posyandu and posbindu activities, which are the bedrock of primary health care, have ceased. This has an impact on the surrounding community's health by raising the number of health problems. Additionally, due to the widespread use of social media, information concerning COVID-19 soon became viral, resulting in a flood of false material, such as COVID-19 is a conspiracy or COVID-19 can self-heal. This information has an effect on the public's dismissive attitude regarding transmission, as seen by failure to follow health standards such as not wearing masks, continuing to attend or host large-scale events, and failing to maintain a safe distance.

In the current industrial revolution 4.0, digitalization is a major challenge and a major opportunity for the world's economy. In Indonesia, the usage of digital technology, which is today known as the Internet of Things (IoT), is still quite limited. Indonesian IoT association research shows that just 10% of Indonesians are now using IoT. Monitoring activities or health conditions remotely will be extremely helpful during the COVID-19 epidemic. COVID-19 can be prevented by limiting contact with people and keeping a safe distance from them. There is currently a lack of IoT adoption in Indonesia's healthcare industry, particularly in the Batujajar region. Many individuals in practically all locations, including Batujajar, are also digitally illiterate, which is an issue that needs to be addressed. Exposure to and usage of technology in the health sector has not

been completely understood, and as a result, its use is still quite limited. From the findings of interviews with the Batujajar sub-district head, it appears that practically all of the residents in the area have smart phones, but that their use is still limited to social media platforms such as WhatsApp, YouTube, and Facebook. Also, technology is still used sparingly for basic services. However, primary health care facilities can use IoT technology so that public health issues can still be addressed without having to close down. This study aimed to examine the implementation of internet of things technology in the primary health care sector towards COVID-19 prevention.

## 2. Method

An experimental two-group pre-posttest design was used in this research study, in which the subject group was first observed before and after receiving an intervention. This method is used to examine the Implementation of internet of things technology in the primary health care sector towards COVID-19 prevention. The study took place during April and May 2021.

Respondents were offered an intervention in the form of internet-based instruction in five sessions (each meeting lasting 45 minutes) over three weeks in the form of talks involving power presentations and applications regarding COVID-19 prevention. All health care professionals download and install the i-health monitor program and practice using it. Following that, COVID-19 patients must download and install the application. The program was used for one week to collect data, and then the completeness of the data was analyzed. Out of every ten COVID-19 patients that use the program, all of them complete the application's contents daily.

The convenience sampling approach was used to select the sample from Batujajar regency, West Java, Indonesia. Respondents in the research sample are individuals who match the following criteria: they are over the age of 18, capable of communicating well, do not have vision or hearing impairment, can read and write, are willing to participate in research, and have access to android gadgets.

The evaluation was included knowledge and skill. The participants were asked to identify strategies to prevent the spread of COVID-19. Each of these three strategies entails an additional knowledge gap of one. Finally, respondents were asked to choose precisely three indications associated with COVID-19 from a selection of nine. Each non-cough, fever, shortness of breath, or novel sensory or olfactory loss symptom selected increases the number of knowledge gaps by one. The knowledge gap value is an integer that can range between 0 and 7 (complete knowledge), depending on the situation.

TABLE 1: shows the differences in scores between the intervention and control groups (n=150).

	Before intervention	After intervention	p-value
Knowledge COVID-19 prevention			
Intervention group	3.02 (SD=1.25)	4.45 (SD=1.31)	0.001
Control group	3.25 (SD=0.89)	3.87 (SD=1.02)	0.260

The univariate analysis used a frequency distribution to summarize the respondents' demographic characteristics and an overview of respondents' knowledge about COVID-19 prevention before and after intervention. Bivariate analysis was used to determine the differences in knowledge of COVID-19 prevention between the control and intervention groups prior to and following treatment. The test was conducted using IBM SPSS statistical software version 23.

### 3. Results

The sample size in this study was 150 people, with 84(56.4%) men and 66 (44.0%) women taking part. 75 respondents were assigned to the intervention group, whereas 75 respondents were assigned to the control group. The respondents' average age was 32.98 years (SD=7.99). The majority of respondents (98%) use social media applications, and the majority of respondents (96.7%) use social daily. The bivariate analysis using independent t-tests and chi-square revealed no significant difference in age, gender, use of social media applications, or time spent on social media applications between the intervention and control groups.

The value of COVID preventive knowledge grew considerably between the pre- and post-intervention periods, from 3.02 (SD=1.25) to 4.45 (SD=1.31), with a t-value of 6.22 and a p-value of 0.000. While there was no significant decline in the control group (p-value 0.260).

#### Discussion

A health monitoring system is an effort to examine data gathered over the course of implementing a health program for patients. The growth of the Internet of Things enables the creation of programs and wearable devices to monitor medical conditions to be integrated. [6] pioneered the use of the internet of things in health monitoring by developing an internet of things-based patient monitoring system for patients with chronic conditions such as diabetes and heart disease. This study examines a variety of factors, including patients, physicians, types of sports, types of diseases, places, hours, and the internet-based tools themselves. The event monitoring system was built in this

effort to monitor the spread of COVID-19 disease by tracking the actions of COVID-19 patients in order to identify high-risk locations for COVID-19 transmission.

The growth of IoT in the health sector enables the development of patient monitoring systems for the prevention of infectious diseases by tracking activity patterns, locations visited, and vital signs as crucial indications of disease spread. However, patient monitoring systems designed for the prevention of contagious or infectious diseases on the basis of IoT remain extremely limited, particularly those that are user-friendly in poor countries such as Indonesia. As a result, a new invention in patient monitoring systems utilizing IoT is required to help prevent infectious diseases in Indonesia. This innovation is projected to help reduce the prevalence of infectious diseases in Indonesia and the associated mortality.

## 4. Conclusion

The implementation of the program resulted in an increase in the knowledge and abilities of health workers regarding the use of technology. Additionally, the installation of health monitoring for tuberculosis patients was accomplished through the use of an intuitive and effective program. Training to boost health workers' capacity for technology use is urgently needed and should be implemented across all facilitate health workers' job. In order to prevent infectious diseases in Indonesia, new developments in patient monitoring systems utilizing IoT are urgently needed.

## References

- [1] Badan Pusat Statistik. Info geografi dan kependudukan. Jakarta. 2020. Available from: <https://www.bps.go.id>
- [2] World Health Organization. Coronavirus disease 2019 situation report – 93. Geneva: WHO; 2020. <https://doi.org/10.1001/jama.2020.2633>
- [3] Worldometers. Coronavirus cases update. Worldometers; 2020. Available from: <https://www.worldometers.info/coronavirus/>
- [4] Covid 19. Data sebaran COVID-19 di Indonesia. Satgas COVID-19; 2020. Available from: <https://covid19.go.id>
- [5] Barat, P.J. Pusat Informasi dan Koordinasi COVID-19 Provinsi Jawa Barat. Sebaran data COVID-19 di Kota Bandung. 2020. Available from: <https://pikobar.jabarprov.go.id>
- [6] Alsan M, Stantcheva S, Yang D, Cutler D. Disparities in coronavirus 2019 reported incidence, knowledge, and behavior among US adults. JAMA Network Open .

2020;3(6):2012403.

- [7] Facher L. As Covid-19 devastates communities of color, the government's minority health experts are conspicuously quiet. StatNews; 2020 Jun 22. Available from: [www.statnews.com/2020/06/22/covid-19-minority-health-experts-conspicuously-quiet/](http://www.statnews.com/2020/06/22/covid-19-minority-health-experts-conspicuously-quiet/)
- [8] McDonnell, Rio GN. Doctors plead with Americans to take the virus surge seriously. New York Times. 2020 Nov 25. Available from: [www.nytimes.com/live/2020/11/15/world/covid-19-](http://www.nytimes.com/live/2020/11/15/world/covid-19-)