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Socialization of The Role of Ventilators as Medical Support Tools for COVID-19 Patients

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ABSTRACT

Covid-19 is a virus that attacks the lungs so that a person will experience breathing problems. The effect caused by the virus is the thickening of the fluid in the lungs, causing the sufferer to experience difficulty in breathing. This service aim is to socialize and educate the role of ventilators as a medical support tool for COVID-19 patients the general public, students, and Medical staff through webinars. The method used is to provide material online through the Zoom meeting application which is attended by 100 participants using the Zoom application. The results obtained were an increased understanding of the COVID-19 virus and understanding of the functions and benefits of ventilators used for patients as measured based on the pre-test at the start of the webinar with an average value of 63.58 and the post-test held at the end of the webinar with an average value -an average of 91.18 with an increase in understanding of 30.27%. The community is very interested in the material presented and hopes that there will be a continuation of the webinar with other topics.

1. Introduction

During this pandemic, the world is being hit by a deadly virus known as the Covid-19 virus. Symptoms caused by the virus are flu, fever, cough, shortness of breath, digestive problems, and headaches. Many people have died due to this virus. This makes the patient experience shortness of breath and difficulty in breathing (Poudel, 2020; Pascarella *et al*., 2020: Afzal, 2020).

Along with the outbreak of the COVID-19 virus, many activities were carried out by universities to educate the public in the form of community service (Masrifatin *et al*., 2021; Hadi & Khairi, 2020). In addition, technology as a supporting tool is also developing with the presence of live support tools which are very helpful in reducing the mortality rate for COVID-19 patients (Iyengar *et al*., 2020; Khan & Parab, 2021).

The mindset of people in the era of the COVID-19 pandemic has also influenced the development of technology in the health sector. There are many applications developed by the private sector from the field of technology that are able to make it easier for the public to access information, consult directly with doctors and medical staff, and obtain information about data related to a person's health condition quickly, precisely and can be accounted for scientifically so that Many people experience mental health problems (Zaidi *et al*., 2023; Ausat & Suherlan, 2021; Zahra & Warsiki G, 2013).

The development of the medical device industry in Indonesia has the potential to experience a positive increase. Quoting a source from the Ministry of Health.go.id, in early 2018 the medical device industry increased by 25.3% or increased to 27 industries so that the total domestic medical device industry became 243 industries with 294 types of medical devices produced. According to a report from the Association of Indonesian Medical and Laboratory Equipment Companies (Gakeslab) profits from sales of medical devices in the country can reach more than 17 trillion rupiah in 2018 with an annual growth rate of 10%. However, most of the medical device products circulating in health facilities, both private and government-owned, are mostly imported products, namely 92% (Rokom, 2018; Usman, 2018; Kirkire *et al*., 2020).

Based on the facts above, the field of electromedical science can play a bigger role in meeting domestic medical device needs and reducing dependence on imported goods. Various educational institutions, research institutions, and individuals have been involved in the development of applications and applied technologies in the electromedical field. Educational institutions with support from the Electromedical Engineering Alumni Association must play a big role in research, development, and application in health facilities. Contributions from the industrial and manufacturing world, especially in terms of cooperation and technology transfer, are also needed to support the development of electromedical educational institutions. If collaboration between educational institutions, alumni associations, and the medical device industry can be realized in a concrete way, then Indonesia has the potential to become one of the countries with centers of electromedical technology development in the world (Peczalski *et al*., 2015; Castellanos *et al*., 2021; Suar, 2022).

In order to realize the above, it is necessary to hold a national webinar in the field of electromedical technology in the hope of increasing knowledge and obtaining new ideas for the development of technology in the health sector, especially in the electromedical field by following the health protocols that have been implemented in the current pandemic era (Indrawati *et al*., 2021; Hamdani *et al*., 2020; Setligt *et al*., 2022; Grant *et al*., 2021).

2. Methods

The method used in community service is the online method. The location community service was held at the STIKes Muhammadiyah Aceh Campus, followed by online participants on January 11, 2022, 10.00-12.00 WIB. Participants came from among Hospital Employees, Medical Equipment Company Employees, Students, and Alumni of STIkes Muhammadiyah Aceh with a total of 100

participants. To provide solutions to the problems that have been identified and formulated above, the following are carried out:

2.1 Pre test

This method is used to determine the level of understanding of the material to be conveyed. In the pre-test, there are ten questions related to the understanding of ventilator equipment, working principles, how to install, how to set, how to operate, standard operating procedures, placement, calibration, application to K3, and troubleshooting.

2.2 Lecture

This method was chosen to convey the role of ventilators for COVID-19 patients who experience respiratory problems.

2.3 Post-test

This method is used to determine the participants' level of understanding of the material that has been delivered. In the post-test, there are ten questions related to the understanding of ventilators, working principles, installation methods, settings, operation methods, standard operating procedures, placement, calibration, application to K3, and troubleshooting.

2.4. Action steps

The steps of the activities carried out are:

1. Lecture on the Profile of the Diploma Three Electro-medical Technology Study Program STIKes Muhammadiyah Aceh.
2. Lectures on stress management in dealing with Covid-19 during a pandemic.
3. Lectures on Maintenance, and use of Ventilators for COVID-19 sufferers
4. Demonstration of proper and correct use of ventilator equipment
5. Practice how to troubleshoot medical equipment
6. Practice how to calibrate medical equipment.
7. Evaluation of learning outcomes that have been prepared.

2.5 Supporting and Inhibiting Factors

Based on the results of the evaluation of the implementation and results of the activities, supporting and inhibiting factors can be identified in carrying out the community service program. Broadly speaking, the supporting and inhibiting factors are as follows:

2.5.5 Supporting Factors

a. Availability of adequate skilled manpower
b. The enthusiasm of the webinar participants was very good.
c. Support from the Chairman of STIKes Muhammadiyah Aceh
d. Availability of supporting funds from STIKes Muhammadiyah Aceh to carry out community service activities.

2.5.6 Inhibiting Factors

a. Frequently disconnected internet connection.
b. Limited time for training implementation
c. The capture power of the participants varies

3. Results and Dicussion

This community service activity is carried out online. Before the event takes place the committee holds a meeting to determine the schedule, form of activity, place, agenda, series of activities. After agreeing on the form of activity, flyers are prepared to convey information about the event. In Figure 1 below is the flyer that is being circulated.

Before the event starts, the committee prepares cameras, microphones, PCs for registration and places. The presenters prepared the material to be presented and the background for the webinar event. Then students who were present at the zoom meeting filled out the attendance list via the Google form and pretest.

Figure 1. Community Service Flyer

The participants who registered were 100 participants, along with the participants who attended the event in the zoom meeting application as can be seen in Figure 2. The event was held on January 11 2022 at the STIKes Muhammadiyah Aceh Campus, Jl. Hope No. 14 Punge Blang Cut. While the participants took part through the zoom meeting application.

Figure 2. Community service participants

As an evaluation material, pretests and posttests were conducted by asking questions related to the understanding of ventilators, working principles, how to install, how to set, how to operate, standard operating procedures, placement, calibration, application to K3, and trouble shooting. From these questions there are indicators of electromedical competence and these questions can be used to measure the level of electromedical competence related to ventilators. Furthermore, the speaker conveys the material as shown in Figure 3 below:

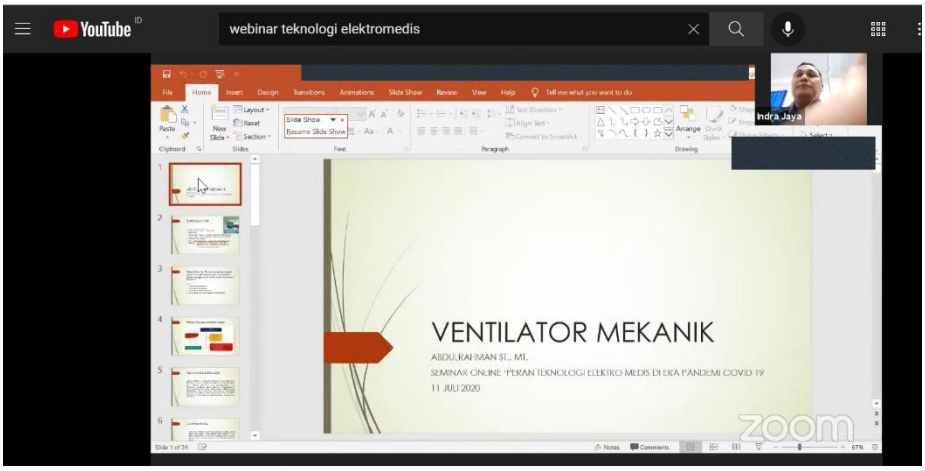

Figure 3. Submission of material by speaker

From the results of the pre test and post test, it can be seen that there is an increase in the ability to master competencies related to ventilator equipment where during the pre test the average score is 63.58 and after the post test the average score is 91.18. So it can be seen that there is an increase in understanding of the material of 30.27%. The pretest and posttest results are as shown in the following figure 4.

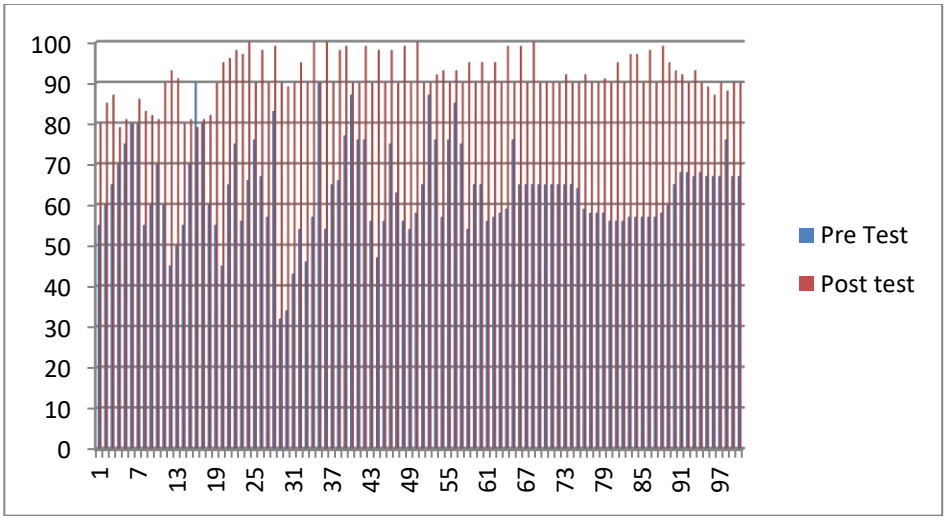

Figure 4. Pre test and post test results

4. Conclusions

This training involved all lecturers of the D3 Electromedical Technology study program at STIKes Muhammadiyah Aceh, the things conveyed in this event were related to increasing electromedical competence, especially Ventilator equipment. From the results of the training, participants were given pretest and post test questions to measure the level of competence before and after being given online training. The conclusion that can be drawn is that during the pandemic, socialization activities in the form of webinars are in great demand by the community, where after participants fill out the pretest on ventilator equipment the results obtained are an average of 63.58 and after filling out the post test get an average score of 91.18 or an increase in competence by 30.27%.

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