

## Original Research

# Effect Of Web-Based Learning To Increase Knowledge Of Basic Life Support For Nursing Students During The COVID-19 Pandemic

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### ABSTRACT

**Background:** COVID-19 does not discriminate based on geography, ethnicity, disability status, age, or gender. COVID-19 can be stopped from entering schools and spreading among infected students and employees, while also limiting disruption and safeguarding students and staff from discrimination. Basic life support is one of the critical skills that have to be mastered via way of means of nursing college students earlier than sporting out clinical placement in hospitals. Due to the constraints of the COVID-19 Pandemic, a web-based learning media was developed to make it easier for students to learn about basic life support from wherever they are.

**Methods:** This study is a comparative experimental study with a pretest-posttest design with a control group. Purposive sampling was utilized in this study. 76 respondents participated in this study and were divided into two groups using the lottery method. The research instrument is form of questions about basic life support developed by the research team. Respondents were divided into 2 groups, namely the experimental group and the control group. The experimental group was given action in the form of independent learning opportunities that were guided using the website while the control group was given treatment in the form of classical learning. Analysis techniques using t-tests.

**Results:** There was an increase in scores between the pretest and the posttest in both groups. The value of the experiment group increased more than that of the control group. The treatment group's score increased by 3.5 points, while the control group's score increased by 1.9 points. The Sig result was 0.00 based on the t-test analysis.

**Conclusion:** Web-Based learning increases nursing students' knowledge of basic life support during the COVID-19 Pandemic.

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## INTRODUCTION

The worldwide economy, people's livelihoods, and health have all been severely damaged by the COVID-19 pandemic. Despite the fact that COVID-19, it has primarily

impacted the health of the elderly. has also disproportionately harmed young people (those under the age of 30 and below), as well as their educational and employment opportunities (Rogobete, 2020). The COVID-19 pandemic has had an impact on every industry, including nursing education. As the crisis worsened, many governments shut down schools, colleges, and institutions to protect students, teachers, and their countries (Agu et al., 2021).

COVID-19 must be prevented from spreading in schools, but caution must be exercised to avoid stigmatizing children and employees who have been exposed to the virus. Remember that COVID-19 does not discriminate based on geography, ethnicity, disability status, age, or gender. All students should be welcomed, appreciated, included, and supported in educational settings. COVID-19 can be stopped from entering schools and spreading among infected students and employees, while also limiting disruption and safeguarding students and staff from discrimination (United Nations Children's Fund (UNICEF), 2020).

Universities for producing future scholars are required to be creative and innovative in line with increasingly advanced technological developments, including advances in information technology. The teaching and learning process service no longer relies on a monotonous model in the classroom but also a device that can facilitate interaction between students and lecturers through online vehicles. Based on the instructions from the Directorate General of Higher Education, the Ministry of Education and Culture of the Republic of Indonesia, it was conveyed that learning in higher education in the even semester of the 2020/2021 academic year starting in January 2021 can be held in hybrid learning. Nevertheless, universities must continue to prioritize the health and safety of campus residents (students, lecturers, staff) and the surrounding community (Directorate General of Higher Education, 2021).

Basic life support is one of the important competencies that must be mastered by nursing students before carrying out clinical practice in hospitals. Basic life support is a competency that must be mastered and is a requirement that must be met before students carry out clinical placement. The majority of previous studies on the effectiveness of web media in improving student competence were carried out in developed countries. Before the pandemic, basic life support learning was carried out with the face-to-face method in class followed by practice in the laboratory.

Due to the constraints of the COVID-19 Pandemic, a web-based learning media was developed to make it easier for students to learn about basic life support from wherever they are. The developed web contains a learning prologue, material packaged in modules, video explanations from lecturers and videos about demonstrations of the implementation of basic life support packaged in a role play. The web is also equipped with an evaluation model in the form of pre and post tests to measure the ability of students to carry out independent learning. This study aims to analyze the effectiveness of web-based basic life support learning to increase nursing student knowledge during the COVID-19 Pandemic.

## **MATERIALS AND METHOD**

This study utilizes a comparative experimental study method with a pretest-post test design with a control group, namely with real treatment of respondents who get actor in the form of web-based learning. The approach of this study was cross sectional namely data collection was only carried out at one time without any follow- up.

This research was conducted from May to September 2021 in Surakarta City, Central Java Province. The research population is a professional program student at a public nursing college in Surakarta City who will carry out clinical practice in a hospital with a total of 80 people. Purposive sampling was chosen for the determination of subjects in this study. From a total of 80 people, 76 people were willing to take part in this study. Inclusion and exclusion criteria were set in this study. Inclusion criteria include students who will carry out clinical nursing practice and are willing to attend this research invitation.

While the exclusion criteria set were students who were not willing to attend to fulfill the invitation to this research. Research respondents were divided into two groups with each group consisting of 38 respondents. The way to divide the respondents is by the lottery mechanism. The experimental group was given the opportunity to learn independently using a web guide while the control group was given the opportunity to learn face to face in class.

Knowledge of basic life support in both groups was measured using the pretest and posttest methods. The research instrument is a question of basic life support knowledge packaged in a learning web developed by lecturers at the Department of Emergency and Disaster Preparedness. Before being used in the study, the research instrument was consulted with 3 experts in the field of emergency nursing to determine its validity and reliability.

In the experimental group, independent learning was applied, guided by the website developed by the researcher. The developed web contains a learning prologue, material packaged in modules, video explanations from lecturers and videos about demonstrations of the implementation of basic life support packaged in a role play. While in the control group, respondents were given a classical teaching method guided by a lecturer teaching in front of the class using power point media equipped with videos. Furthermore, the research data were analyzed using t-test.

Research permits were obtained from the local government and university leaders and have received an ethical clearance certificate from the Health Research Ethics Committee of the Regional General Hospital, Dr. Moewardi with the number 582/V/HREC/2021 dated 7<sup>th</sup> May 2021.

## RESULTS

76 respondents signed the research agreement and were further divided into 2 groups, namely the experiment group and the control group. Demographic data are shown in tables 1 below.

**Table 1.** Distribution of respondent's demographic

Characteristics		Frequency	Percentage (%)
Gender	Male	10	13.2
	Female	66	86.8
Total		76	100.0
Age	17-20 years	20	26.3
	>20 years	56	73.7
Total		76	100.00

It can be seen in table 1 that women dominate as respondents in this study (86.8%). Moreover, the majority of respondents are more than 20 years old (73.3%). Table 2 shows the level of knowledge in the two groups of respondents.

**Table 2.** Level of knowledge of respondents

Var	Pretest			Posttest	
	Level	Frequency	Percentage	Frequency	Percentage
			(%)		(%)
Experiment group	High	4	10.5	8	21.1
	Medium	26	68.4	28	73.6
	Low	8	21.1	2	5.3
Total		38	100	38	100
Control group	High	4	10.6	6	15.8
	Medium	28	73.7	29	76.3
	Low	6	15.7	3	7.9
Total		38	100	38	100

Table 2 shows that the majority of respondents in both groups, both at the time of pretest and posttest, were at a moderate level. There was an increase in the level of the posttest in all groups of respondents. The results of the pretest and posttest in the two research groups as well as the results of the analysis of the different tests can be seen in Table 3 below.

**Table 3.** Result of pretest and posttest-data analysis

Experimental Group					Control Group				t-test	
Average		Average			Average		Average		increase value	Sig
Pre-test	Post-test	increase value	Min	Max	Pre-test	Post-test	Min	Max		
6	9.5	3.5	40	81	6.3	8.1	42	80	1.9	0.0

Table 3 shows that there was an increase in scores between pretest and posttest in both groups. The treatment group had a higher increase in value than the control group. The increase in the score in the treatment group was 3.5 while the increase in the score in the control group was 1.9. Based on the t-test analysis, the Sig result was 0.00. Hence, there is a significant difference between the increase in the score in the treatment group and the increase in the score in the control group.

## DISCUSSION

This study shows in the pretest test that the majority of respondents in both the experimental group and the control group are at a moderate level of knowledge about basic life support. Only 4 people in both groups had a high level of knowledge. In the experimental group there were 8 respondents and in the control group there were 6 respondents who were at a low level of knowledge.

After each group received treatment, there was an increase in the level of knowledge. There was an increase in knowledge in both groups of respondents. The

increase in the average score was higher in the experimental group who received the independent learning model with website guidance.

Nursing students who carry out clinical placement in a health care setting will learn to carry out nursing actions under the supervision of a senior nurse as a clinical instructor. Nurses should be able to provide high-quality emergency care. Nurses may face a number of emergency scenarios in the hospital and in the community, such as sudden cardiac arrest. In these cases, nurses must be the first to deliver basic life support.

In acute conditions, nurses who successfully administer first aid and basic life support protocols may have a positive impact on cardiac arrest morbidity and mortality rates. Advanced life support techniques would benefit greatly from nurses with superior knowledge and skills in basic life support operations (Kose et al., 2019). Before students carry out clinical practice, nursing schools are required to prepare basic life support competencies so that students are confident and able to take action if one day they find a patient's condition that requires basic life support action. School of nursing is required to carry out both theoretical and practical learning.

Current information should be updated, technical skills should be consolidated, and appropriate self-esteem related to the application should be formed in accordance with training and manual instructions prepared for the health team in order to successfully administer cardiopulmonary resuscitation (Kose et al., 2019). However, during the current COVID-19 pandemic, direct learning is very difficult to implement because of the risk of spreading viral infections. School of Nursing must develop an effective learning model to help students master a competency.

The inauguration of schools and institutions in the autumn of 2020 will present new problems and hazards for transmission on campuses and in the adjacent neighborhoods. In young adults without underlying medical disorders, the risk of serious health repercussions from COVID-19 infection is modest, instructors, university personnel, and close friends and family members of college students at home and in the community may face a substantially increased risk of serious illness and death if they undergo infected (Walke & Honein, 2020).

Responding to the uncertain conditions of COVID-19, it is necessary to develop an online learning model to help students learn without fear of contracting the COVID-19 virus. Web-based learning as an alternative. The use of Internet technologies for delivering instruction is referred to as web-based learning (WBL). WBL is a new field in the sense that it brings together a number of previously independent domains that underpin educational and technological practice.

While the Internet has many of the same features as past technologies, such as audio, video, and videoconferencing, it also offers new technological possibilities that are expected to change many aspects of education (Aggarwal, 2014). Actually, web-based learning has long been implemented in the nursing areas. Initially web-based learning was used to bridge the need for continuous learning for nurses working in places far from campuses and other reasons. Nurses who have employment and family commitments, work shifts, and may reside a long distance from institutions of higher education face a problem in accessing continuing education Canadian Nursing Association, 1997 cited by (Atack & Rankin, 2002).

The results of this study reveal that both groups' scores improved between the pretest and posttest. There is a significant difference in the increase in the treatment group's score compared to the increase in the control group's score. The previous

systemic review study demonstrates that the effects of e-learning are mostly reported in terms of reactions, knowledge, attitude, self-efficacy, and skills.

In terms of how the learning can be transferred to modify practice and affect patient outcomes, the effectiveness of e-learning interventions employed by nurses in a continuing education environment is uncertain (Rouleau et al., 2019). Web-based education has shown to improve participants' knowledge and skills performance, as well as their self-efficacy in executing nursing skills, with a high percentage of participant satisfaction. Experiments with greater rigor are encouraged (Du et al., 2013).

The results of the previous study shows that web-based interactive learning is far more effective than traditional education in terms of boosting EBP knowledge and skills, as well as confidence in constructing clinical queries. Moreover, this previous study discovered that animations with storylines - which increase students' empathy and immersion in clinical scenarios - are more effective at enhancing students' competence than traditional instruction, which focuses solely on delivering knowledge (Park et al., 2020).

The subjects' ability to access the learning model via the website at any time and from any location contributes to its efficacy. Furthermore, the website was interactive and incorporated learning assistance features such as animations, case studies, and computer modules for the nurses to practice what they had just learned (Sung et al., 2008). However, web-based learning needs to be re-examined in order to acquire psychomotor competence. Results of previous studies.

These findings of previous study imply that combining e-learning and face-to-face education in the classroom to improve drug knowledge is beneficial. An e-learning program can reduce the amount of time and money spent speaking on issues like medication, implying that it could be a valuable addition to nurse education programs (Sung et al., 2008). To reach the psychomotor realm, practice-based learning is needed, such as role play using algorithmic guidance. In a previous study, an algorithm-guided disaster preparedness simulation could improve the competence of community nurses in practicing disaster preparedness (Harnanto & Sunarto, 2019).

## CONCLUSIONS

It can be concluded that Web-Based Learning increases nursing students' knowledge of basic life support during the COVID-19 Pandemic. There are many obstacles experienced by students in learning basic life support during the COVID-19 pandemic, hence a learning method and media are needed that are able to ensure student safety and provide complete information and are packaged in an interactive package.

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