



The Effect of Virtual Learning on Medical Student Professionalism: A Systematic Literature Review

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ABSTRACT

Background: Education is an action to develop a potential of human resources accompanied by learning facilities. Education itself has long been attached and developed in human life until now. The number of Covid-19 transmissions in Indonesia is increasing and causing many victims. To break the chain of spreading this virus, the government has formulated a policy that requires students throughout Indonesia to study from home. So that the learning process is free from these conditions, alternative steps are taken, namely through virtual learning.

Objective : The purpose of this study is to compare the literature that has subject matter related to evaluating journals according to the PRISMA and PICO (Problem, Intervention, Comparison, Outcome) methods. Some data were taken from ten articles that were included in the inclusion criteria, including year, keywords, research title, population.

Methods: This systematic literature review is based on an analysis of the literature available in the Pubmed, Elsevier, and Google Scholar databases in English.

Results: From the 10 literatures that have been analyzed, 8 of them state that virtual learning is considered to have the potential to create professional values for medical students

Conclusion: The COVID-19 pandemic has certainly had an impact on learning activities and could affect the professionalism of medical students, but this can be overcome if the campus is able to provide adequate facilities.

Introduction

Education is an action to develop a potential of human resources accompanied by learning facilities. Education itself has long been attached and developed in human life until now (Mahmudah, 2020). There are

two methods that have been broadly applied in human daily life, such as face-to-face education and virtual education.

The main feature of virtual education is the physical isolation between teacher and students. The existence of this physical

separation increases the behaviour of teachers and students that are different from their behaviour in face-to-face education. In distance education, students who want to be successful must have independent learning, because students must act as teachers, especially in motivating themselves to learn. Based on the condition of students receiving face-to-face and distance education, it seems that there is a gap. Students in virtual education must study independently with students who receive face-to-face education.

The number of Covid-19 transmissions in Indonesia is increasing and causing many victims. To break the chain of spreading this virus, the government has formulated a policy that requires students throughout Indonesia to study from home. So that the learning process is free from these conditions, alternative steps are taken, namely through virtual learning.

In the context of virtual learning, independent learners have the ability to learn in conditions that requires them to be completely independent from their teachers. There are four dimensions of autonomous learning, namely:

- a) Autonomy
- b) Self-management
- c) Need to learn independently
- d) Learner control over learning

As a medical student, we are always requiring to prioritize professionalism in

dealing with problems. In the problem of face-to-face learning with distance learning, medical students take on the role of health consultants and provide critic and solutions. Therefore, the different effects on face-to-face learning with virtual learning can increase the sensitivity of medical students.

Methods

In the era of evidence-based medicine or what is known as evidence-based medicine, clinicians must be able to apply the results of peer reviewed scientific research to individual patients in carrying out their duties as doctors. This type of research is a type of systematic literature review.

This systematic literature review is based on an analysis of the literature available in the Pubmed, Elsevier, and Google Scholar databases in English. The purpose of this study is to compare the literature that has subject matter related to evaluating journals according to the PRISMA and PICO (Problem, Intervention, Comparison, Outcome) methods. From the search results using the keywords COVID-19, virtual learning, professionalism, medical students found as many as 73 literatures were found.

Result and Discussion

Based on ten selected literatures, all samples used were medical students. Two

articles focused on clinical medical students, while the other focused on preclinical medical students. Various kinds of intervention methods are used to obtain the relationship between virtual learning methods and the professional value of medical students, for example in research that has the same intervention method, namely the study by Sani *et al* (2020); Hilburg *et al* (2020); and Afonso *et al* (2020) which mentions the use of virtual teleconference to fulfil teaching and learning activities for medical students during the Covid-19 pandemic. In a study by Findyartini *et al* (2020) in this study they used written reflection analysis during the COVID-19 pandemic through the PIF (Professional Identity Formation) lens method. In the research of lancu *et al* (2020) with the use of telemedicine, the intervention was also used by Afonso *et al* (2020). In a study by Nivamat *et al* (2021) mention intervention by providing e-learning modules to medical students during virtual learning. In research by Think *et al* (2021) conducted a multicentric during the COVID-19 pandemic from 2 February 2021 to 1 April 2021 through social media. In a study by Park *et al* (2021) using the intervention of identifying research questions, identifying relevant literature, selecting included studies, mapping data, compiling, and summarizing. In a study by Tabatabai (2020), this study

uses a virtual reality simulation (VRS) intervention where students will feel like they are in a different environment. It is very possible for medical students to learn from clinical experiences through virtual simulations as they would in real hospital-based experiences. Meanwhile, in the research of Mulcare *et al* (2020) an intervention in making an 8-hours modular curriculum based on simulation was carried out using the PEARLS question and answer framework with video-based meetings that focused on “website manner”.

Almost all of the comparisons raised in the literature compare learning before COVID-19. However, there are 2 other literatures that compare the student adaptation process and coping strategies in the face of a pandemic; student adaptation process for learning; and the role of medical students during the pandemic, it is mentioned in the literature by Findyartini *et al* (2020) and Park *et al* (2021).

From the results of these studies, four literatures show that telemedicine has the potential to increase the value of professionalism, knowledge, communication skills, and technological literacy, including research by lancu *et al* (2020); Sani *et al* (2020); Afonso *et al* (2020); Mulcare *et al* (2020). For the results of research by Findyartini *et al* (2020) stated that the students in this study, seemed

to be able to use adaptive coping mechanisms, this is certainly very helpful for students in the formation of professional identities. Then in research by Nivamat *et al* (2021) stated that competency-based medical education (CMBE) in an e-learning system supports skills development and focuses on professional training to produce Indian medical graduates who are globally competitive and can meet the growing health needs of the public. And also there are contradictory research results, there are two literatures by Hilburg *et al* (2020) and

Tabatabai (2020) stated that virtual based medical education has been considered superior to traditional education due to the COVID-19 pandemic so that it can replace face-to-face lectures and small group meetings, but in the other two literatures by Thind *et al* (2021) and Park *et al* (2021) stated that the development of new education (virtual learning) is still full of challenges and is still considered ineffective and also there are still many students who pay less attention to learning during online lectures.

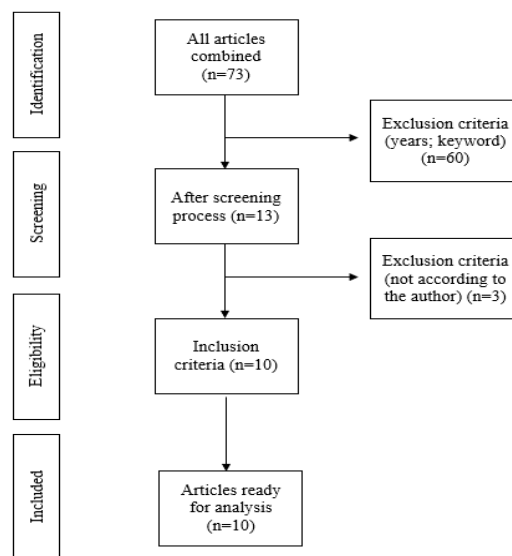


Figure 1. PRISMA Flowchart

Article Analysis

No	Title	Authors, year of Publication	Population	Intervention	Comparison	Outcome
1	Unmuting medical Students Education: Utilizing Telemedicine During the COVID-19 Pandemic and Beyond	Iancu et al, 2020	Pre-clinical medical student	Use of telemedicine	Before pandemic	Optimal use of telemedicine but not limited to communication, physical examination, professionalism and technological literacy
2	Exploring medical students' professional identity formation	Findyartini et al, 2020	Pre-clinical medical student	Written reflection analysis during COVID-19 pandemic using the PIF	Student adaptation processes and coping	The students in this study appeared to be able to use adaptive coping mechanisms. Clinical student appears to be facing greater challenges in

No	Title	Authors, year of Publication	Population	Intervention	Comparison	Outcome
	through written reflections during the COVID-19 pandemic			(Professional Identity Formation) lens methods.	strategies in dealing with the pandemic; their adaptation process to study; and their role as medical students during the pandemic	adapting their learning than preclinical students, due to the temporary cessation of clinical rotation during the pandemic, which has prevented clinical students from having real clinical experiences
3	Online Medical Education Challenges and Probable Solutions in the Age of COVID-19	Nirmavat et al, 2021	Pre-clinical medical student	Online medical education with providing e-learning modules	Traditional learning	Competency-Based Medical Education (CBME) in e-learning systems supports skills development and focuses on professional training to produce Indian medical graduates who are globally competitive and able to meet the growing health needs of society
4	Impact of the COVID-19 pandemic on Caribbean Medical Students: A cross-sectional study	Thind et al, 2021	Pre-clinical medical student	Conducted a multicentric survey during the COVID-19 pandemic from 2 February 2021 to April 2021, via social media sent to second, third- and fourth- year students in Many Caribbean private medical schools	Face-to-face learning method	Online learning is reported to be less time efficient and many students pay less attention to learning during online lectures.
5	Understanding the consequence of COVID-19 on undergraduate medical education: Medical students' perspective	Sani et al, 2020	Pre-clinical medical students	Enforce the quality of medical education such as conducting virtual interprofessional educational sessions to solve clinical sketches and virtual consultation skills with simulated patients	The impact of education medical students before the COVID-19 pandemic	The implementation of virtual consultations with simulated patients can be an alternative step to overcome the problem of medical education during COVID-19. General practitioners throughout the UK have successfully utilized telephone and video consultations to manage patients' complaints, therefore this modality should be aligned with undergraduate medical education
6	A scoping review on adaptation of clinical education for medical students during COVID-19	Park et al, 2021	Pre-clinical medical student	Identification of research questions identifying relevant literature, selecting included studies, mapping data, compiling, summarizing, and reporting results	The process of adapting clinical teaching for medical students in responding to COVID-19 from the beginning of COVID-19 until now	New educational developments caused by the pandemic are still fraught with challenges and there is still a lack of evidence of the effectiveness of virtual education.
7	Medical education during the coronavirus disease 2019 pandemic: learning from a distance	Hilburg et al, 2020	Pre-clinical medical student	Adaptation of social restrictions in medical education by using video conference software, social media platforms and open access medical journals	Face-to-face learning before COVID-19	The COVID-19 pandemic has necessitated the adoption and implementation of technologies already available in medical education. In many institutions Zoom and similar video conferencing platforms such as BlueJeans and Microsoft Teams have now replaced face-to face lectures and small group meetings.
8	"I Have a Cough": An interactive virtual respiratory	Afonso et al, 2020	Pre-clinical medical student	By providing interactive online modules in three sections for preclinical	Learning methods before COVID-19	This session was conducted for 122 first rear medical students. This module was well received by students. Majority felt that it helped improve

No	Title	Authors, year of Publication	Population	Intervention	Comparison	Outcome
	case-based module			medical students (first and second years) who have not studies the respiratory physical examination, among others through video conferencing software and telemedicine		their telemedicine communication skills (93%), interpretation of physical examination findings (84%), development of differential diagnosis (95%), and correlation of clinical, and clinical basic science content (93%)
9	COVID-19 impact and virtual medical education	Tabatabai, 2020	Pre-clinical medical student	Virtual Reality Simulation (VRS) has the unique ability to make students believe they are in a different environment. This allows medical students to learn from real hospital-based experiences	Traditional education methods	Virtual simulation-based medical education has been found to be superior to traditional clinical education
10	Advanced communication and examination skills in tele medicine: A structured simulation-based course for medical students	Mulcare et al, 2020	Pre-clinical medical student	Creating a simulation-based-8-hour modular curriculum using the PEARLS question and answer framework with video-based meetings focused on a “website manner”	Traditional learning	Out of 98 medical students in their first clinical year participated in 2019. Of the participants, 97% were enthusiastic about the course, 100% they felt simulation was an effective mechanism for delivering educational materials. After participation, 71% believed that telemedicine had the potential to become part of their future practice; 92% feel an improvement in their comfort and ability to conduct video-based patient encounters.

Conclusions

Of the 10 literatures that have been analysed, 8 of them state that virtual learning is considered to have the potential to create professional values for medical students. The COVID-19 pandemic has certainly had an impact on learning activities and could affect the professionalism of medical students, but this can be overcome if the campus is able to provide adequate facilities. This is done so that the virtual learning activities of medical students remain effective and optimal so that the professional value of medical students is maintained.

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