

## Original Research Article

# Evaluation of implementation and satisfaction of distance learning among medical students during COVID-19 pandemic in Indonesia

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## ABSTRACT

**Background:** Since it was declared as a pandemic by the world health organization (WHO) on March 11th, 2020, COVID-19 has become a global health problem in the world. The temporary closure of schools and universities was carried out to protect teachers and students from viruses, including in medical schools. Distance learning has been implemented as an alternative to substitute conventional class. This can affect the satisfaction of medical students toward it. This study aim was to evaluating implementation and analyzing the factors that influence medical student' satisfaction toward distance learning during the COVID-19 pandemic.

**Methods:** An observational analytic study with a cross-sectional study was used. A total of 3331 respondents from all over Indonesia responded through an online questionnaire by Ikatan Senat Mahasiswa Kedokteran Indonesia (ISMKI) distributed from April 9th, 2020 to June 21st, 2020. Data analyzed using chi-square test (alternative: fisher exact test) and logistic regression with significance  $\alpha=0.05$ .

**Results:** Study showed that most respondents had difficulties in learning and had less satisfaction toward distance learning. Factors that showed statistical significance were university origin grouped by type, region, accreditation, and readiness.

**Conclusions:** Although distance learning is a solution to the problems of medical education during this pandemic, the government and related institutions should be able to continue evaluating so that the learning system remains effective and efficient.

**Keywords:** COVID-19, Readiness, Medical students, Distance learning

## INTRODUCTION

The pandemic caused by virus has become a global health problem in early 2020.<sup>1</sup> The first case of this pandemic was found on December 30th, 2019 in the Wuhan, China. On January 7th, 2020, a new type of betacoronavirus was discovered and identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the disease caused by the virus was called COVID-19.<sup>2</sup>

Since it was declared as a pandemic by the world health organization (WHO) on March 11th, 2020, COVID-19 has become the biggest challenge faced by humans since

the second world war.<sup>3,4</sup> More than 200 countries/regions have reported COVID-19 confirmed cases, including China, Italy, South Korea, the United States, Malaysia, Japan, Russia, and Indonesia.<sup>4</sup> Because of its rapid transmission, the policies which avoiding close contact and maintaining physical distancing between people are implemented to prevent an increasing rate of infections and mortality rate.<sup>5</sup>

Physical distancing is one of the policies recommended by WHO in reducing the incidence of COVID-19. Physical distancing with a distance of 1 meter is an effective way, and will be even more effective when using a distance of 2 meters.<sup>5</sup> However, this policy also

has some disadvantages on various sectors, one of which is the educational system.<sup>6</sup>

The educational system has affected by the long-term impact of the COVID-19 pandemic. The closure of schools and universities is temporarily enforced to protect teachers and students from virus transmission<sup>6</sup>. Medical students also experience the same impact.<sup>6</sup> Distance learning has been implemented as an alternative to substitute conventional class.<sup>8</sup> However, medical student competencies that requires basic practice skills when dealing with patients directly becomes delayed due to the policy.<sup>9,10</sup> This can affect the satisfaction of medical students toward distance learning. It became the basis of interest for the authors to evaluating implementation and analyzing the factors that influence medical student' satisfaction toward distance learning during the COVID-19 pandemic.

## METHODS

An observational analytic study with a cross-sectional study was designed for the present study. The population is medical students in Indonesia which using the internet. Respondents were 3,331 people responded to online questionnaires distributed by Ikatan Senat Mahasiswa Kedokteran Indonesia (ISMKI) from April 9th, 2020 to June 21st, 2020. Data were collected using a structured interview method in the form of a closed and open-ended question questionnaire. The results are used to obtain data to evaluate the implementation and analyze the factors affecting the medical students' satisfaction toward distance learning during COVID-19 pandemic.

Variables are measured as indicator variable. After that, the results on the independent and dependent variables are converting into a value. The satisfaction score is determined using a Likert scale, according to the answers of the respondents. The obtained data by researchers will be converted into tabular form, which will then be processed using IBM SPSS Statistics 24. Data analyses used were univariate, bivariate, and multivariate data analysis. Univariate analysis displays frequency distribution and in tabulated form. Bivariate analysis used is the chi-square hypothesis with fisher exact as an alternative. The results of the analysis showed the p value compared with the degree of significance  $\alpha=0.05$ . Multivariate analysis used is logistic regression, by calculating the value of exp (B) and the probability of satisfaction' formation calculated by the following equation:

$$\text{Probability} = \frac{1}{1+e^{-y}}$$

## RESULTS

Table 1 and 2 present data on respondents' responses and evaluation toward problems faced by students and teachers when implementing the distance learning. From 3331 respondents, 57.9% revealed that the problem faced

by medical students when implementing distance learning was difficulty in learning.

**Table 1: Problems faced by medical students toward distance learning (n=3331).**

Students' problems	Frequency	
	N	%
Limited internet quota	144	4.3
Interruption of signal/internet connection	663	19.9
Difficulty in learning	1927	57.9
Not reliable in using technology	17	0.5
Limited equipment and facilities	58	1.7
Irregular learning schedules	114	3.4
No obstacle	408	12.2
Total	3331	100

**Table 2: Problems faced by teachers toward distance learning (n=3331).**

Teachers' problems	Frequency	
	N	%
Interruption of signal/internet connection	1068	32.1
Learning materials became difficult to understand	2	0.1
Not reliable in using technology	519	15.6
The learning schedule provided is uncertain	432	13.0
Rarely gives lectures directly	23	0.7
The sound, visual, and learning materials are not good	31	0.9
No obstacle	1256	37.7
Total	3331	100

The difficulty in learning faced by respondents in distance learning were the lack of a conducive learning atmosphere, lack of understanding of the material provided by the teacher, also the difficulty of clinical students to learn directly from patients. However, the difficulty to focus when listening to the material being the most reason respondents when experience learning difficulties in distance learning (51.5%). In addition, other problems faced by respondents were irregular learning schedules (3.4%), interruption of signal/internet connection while studying (19.9%), limited internet quota (4.3%), limited equipment and facilities (1.7%), and the respondents are not reliable in using technology (0.5%). However, some respondents actually said they did not experience any obstacles when doing distance learning (12.2%).

Meanwhile, Table 2 shows that as much as 37.7% of respondents actually did not experience any problems from the teacher when giving learning material. Even so, there were respondents who revealed some obstacles on the teacher when doing distance learning, which are interruption of signal/internet connection (32.1%), the learning materials became difficult to understand (0.1%),

the teacher was not reliable using technology (15.6 %),  
the learning schedule provided is uncertain (13.0%),

rarely gives lectures directly (0.7%), and also the sound,  
visual, and learning materials are not good (0.9%).

**Table 3: Univariate and bivariate analysis: factors affecting medical students' satisfaction toward distance learning (n=3331).**

Factors	Satisfaction				PR CI 95%	P value
	Low		High			
	N	%	N	%		
Gender						
Male	558	56.6	427	43.4	1.149 (0.988-698)	0.101
Female	1256	53.5	1090	46.5		
University origin (type)						
State/Public	659	51.3	625	48.7	0.804 (0.698-0.927)	0.004
Private	1155	56.4	892	43.6		
University origin (region)						
Region 1	479	52.5	434	47.5	-	0.014
Region 2	693	58.1	499	41.9		
Region 3	527	51.9	488	48.1		
Region 4	115	54.5	96	45.5		
University origin (accreditation)						
A	476	51.3	452	48.7	-	0.056
B	1166	56.2	910	43.8		
C	59	49.2	61	50.8		
D/TA	113	54.6	94	45.4		
Class						
<2015	133	56.4	103	43.6	-	0.125
2016	141	54.7	117	45.3		
2017	421	51.5	397	48.5		
2018	518	57.6	381	42.4		
2019	601	53.7	519	46.3		
Phase						
Preclinical phase	1694	54.7	1404	45.3	0.858 (0.656-1.122)	0.347
Clerkship phase	120	51.5	113	48.5		
Residence						
Living with family	1593	54.7	1321	45.3	1.056 (0.858-1.298)	0.522
Alone	221	53.0	196	47.0		
Application						
Text-based	728	56.0	572	44.0	-	0.277
Video-based	1085	53.5	943	46.5		
Mixed	1	33.3	2	66.7		
Internet connections						
Internet from	780	55.6	624	44.4	1.072 (0.933-1.232)	0.278
phone/tethering Wifi	1034	53.7	893	46.3		
Learning interaction models						
Non-face-to-face	113	59.2	78	40.8	-	0.212
Face-to-face	787	53.1	695	46.9		
Mixed	914	55.1	744	44.9		
Devices						
Hand phone	276	56.3	214	43.7	-	0.565
I-pad/Tablet	63	58.3	45	41.7		
Laptop/Notebook/Macbook	595	53.2	523	46.8		
Desktop	880	54.5	735	45.5		
Readiness						
Low	276	59.0	192	41.0	1.223 (1.002-1.493)	0.034
Good	1538	53.7	1325	46.3		

**Table 4: Logistic regression multivariate analysis: factors affecting medical students' satisfaction toward distance learning (n=3331).**

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95% CI for Exp (B)
<b>University Origin (Type)</b>	-0.196	0.073	7.213	1	0.007	0.822	0.713 – 0.948
<b>University Origin (Region)</b>	0.016	0.039	0.169	1	0.681	1.016	1.010 – 1.503
<b>University Origin (Accreditation)</b>	0.031	0.048	0.412	1	0.521	1.031	0.941 – 1.097
<b>Readiness</b>	0.208	0.101	4.223	1	0.040	1.232	0.938 – 1.134
<b>Constant</b>	-0.383	0.299	1.633	1	0.201	0.682	

Table 3 presents the distribution of respondents and several factors related to medical students' satisfaction toward distance learning. The result shows that most respondents are women (70.4%). Most respondents are from Region II-University based on the ISMKI area system (35.8%), private universities (61.5%), and were type B universities (62.3%). Almost every respondent is in preclinical phase (93.7%). As many as 33.6% of the respondents coming from the class of 2019. Two-thirds of the total respondents live with their families (87.5%). Most respondents used desktop devices during online (48.5%), applied a mixed-learning interaction model (49.8%), used video-based application (60.9%), and chose wifi as their internet connection network (57.9%). More than half the numbers of respondents have good readiness (86.0%), but have less satisfaction (54.5%). Factors that showed statistical significance were university origin, grouped by type ( $p=0.004$ ), region ( $p=0.014$ ), and accreditation ( $p=0.056$ ), and also readiness ( $p=0.034$ ). Statistical test using Chi-square on readiness variable resulted in PR 1.223 ( $PR>1$ ). Respondents who have a good level of readiness toward distance learning tend to have a good level of satisfaction too.

Meanwhile, (Table 4) shows that the readiness variable ( $p=0.040$ ) has the largest exp (B) value (1,232) compared to other variables. This shows that the variable with the strongest relationship is the readiness variable. Using the formula, the probability of a member of the population to get good satisfaction toward distance learning is 99.2%.

## DISCUSSION

Satisfaction is the level of one's feelings after comparing the performance/results he/she feels with his/her expectations.<sup>11</sup> This study describes the evaluation of implementation and several factors that affect the medical students' satisfaction toward distance learning during the COVID-19 pandemic in Indonesia. The university origins, grouped by type, region and accreditation, as well as readiness are influential factors in this regard.

Distance learning, which is perceived as an innovation of the 21st century, is an educational system that has broad reach, across space, time, and socioeconomics. The system opens access to education for anyone, anywhere, and anytime. With these characteristics, distance learning

systems are often seen as a solution to various educational problems, especially those relating to equity and democratization of education, as well as expanding access to quality education to all levels of society.<sup>12</sup> However, the learning must be adjusted to the quality of services provided by the relevant institutions. If the services provided do not meet user expectations, satisfaction toward distance learning will not be achieved.<sup>13</sup>

The COVID-19 pandemic affected the educational system throughout the world, including Indonesia. Temporary closure of schools and universities must be carried out to protect teachers and students from human transmission of the virus.<sup>6</sup> Distance learning can be one of the solutions implemented in order to meet the needs of students who need knowledge during the COVID-19 pandemic. However, distance learning is actually a new educational concept, especially for medical students.<sup>8</sup> The pandemic that occurs suddenly and not expected to come makes rapid changes in the educational system, from the conventional class to distance learning by utilizing technology. Therefore, the quality provided by this system is indeed not too good, especially for medical students.

This study shows that there are several obstacles and problems faced by medical students in Indonesia when implementing distance learning during COVID-19 pandemic. These problems are not only come from students, but also come from teachers. The main problem complained of in students was learning difficulties. Some respondents revealed that the difficulties occur due to difficult to focus during learning, lack of a conducive learning atmosphere, lack of understanding of the material provided by the teacher, and the difficulty of clinical students to learn directly from patients. This is supported by a study which also discussing about students' problems toward it. Such learning does have several benefits such as time flexibility, low cost of education, and students can attend more than one lesson. But too much flexibility makes students less able to apply discipline.<sup>14</sup> This can cause students to become unfocused, unable to understand the material well, and feel the atmosphere of learning that is not conducive. In addition, medical students not only need knowledge in theory, but need practical knowledge and communication. Such knowledge must be applicable to patients when they have become doctors.<sup>9,10</sup>

Other problems faced by respondents were irregular learning schedules, interruption of signal/internet connection while studying, limitations on internet quota, limited equipment and facilities, as well as respondent's ineligibility in using technology. It relates to the equipment and service facilities used when doing distance learning. This has become a consequence that the devices and facilities are factors that determine the effectiveness of distance learning.<sup>15</sup>

The obstacles encountered during distance learning also occur not only in students, but also in teachers. The problems that exist in the teachers are interruption of signal/internet connection, delivery of material becomes difficult to understand, the teacher is not reliable in using technology, the lecture schedule provided is uncertain, the teacher rarely gives lectures directly, and the sound, visual, and learning materials is not good during distance learning. Learning system given by institutions can lose its quality when the class does not provide opportunities for students to actively contribute. When in conventional classes, students are able to contribute by giving their experiences, questions, and directing the class to discussing sessions so that the learning material becomes more understandable. It's different when implementing distance learning; students only listen to recorded sounds or view videos monotonously.<sup>14</sup> Another study also mentioned that the ability to use technology, both teachers and students also determine the effectiveness of distance learning. Sometimes, many teachers do not use technological developments properly in learning process so that it also impacts the quality of learning.<sup>15</sup>

A meta-analysis study conducted in the United States examined the effectiveness and evaluation of distance learning against conventional learning, which was assessed by comparing the performance of students while studying and taking exam. The results of the study indicate that distance learning can slightly improve student performance during exams compared to conventional learning. However, the simultaneous interaction of learning, learning atmosphere, and learning material used as an evaluation due to the negative impact of distance learning in improving these aspects.<sup>16</sup>

Satisfaction can be one of the factors to assess the effectiveness of implementing distance learning.<sup>16</sup> There are many factors that determine medical students' satisfaction toward distance learning. Satisfaction will occur if the institution is able to provide products, services, and other aspects in accordance with expectations or exceed user expectations.<sup>17</sup> In general, the principles of conducting distance learning include access, equity, and quality. These three principles underlie the implementation of distance learning as mandated in the applicable laws and regulations. These three principles can also be the basis for determining students' satisfaction.<sup>12</sup>

University origin divided into four regions according to rules from ISMKI affecting the medical students' satisfaction in Indonesia toward distance learning during the COVID-19 pandemic. Universities have an important role in supporting the implementation of distance learning.<sup>18</sup> Universities that are closer to the center and the capital area have a higher level of satisfaction because of access to facilities and services that are more easily affordable compared to universities that are further away. Education access is influenced by the country's geographical conditions. In particular, rapidly developing information and communication technology can support distance learning systems to increase education openness, utilize the limitations of time, place, and overcome economic problems as well as the demographic conditions of community members to obtain educational services.<sup>12</sup>

University origin according to the type is divided into two groups, which are state/public universities and private universities. Besides, universities are also divided by accreditation into several types starting from the highest (type A) to the lowest (type D/TA). Both of these categories affect the medical students' satisfaction in Indonesia toward distance learning during the COVID-19 pandemic. Equity and quality of service in institutions are the reasons why these factors are related.<sup>12</sup> Public universities managed by the government differ in terms of equity and quality compared to private universities managed by certain individuals or groups and foundations.<sup>19</sup> Universities that are grouped based on accreditation also have differences in terms of the quality of learning provided. Universities that have high accreditation tend to have good quality of learning compared to universities with low accreditation.<sup>20</sup> Therefore, the services provided by related institutions regarding distance learning greatly affect students' satisfaction.<sup>12</sup>

Readiness toward distance learning also affects the medical students's satisfaction toward it during the COVID-19 pandemic in Indonesia. Someone's good readiness toward learning will have a positive self-efficacy. Self-efficacy has an effect on someone's satisfaction.<sup>20</sup> A study revealed that someone who is more confident using computers and the internet has a good level of satisfaction.<sup>21</sup> Positive self-efficacy during distance learning tends to increase self-satisfaction. Distance learning is a learning system that can be implemented during the COVID-19 pandemic. The characteristics of the learning which are flexible, cross-space, time, and socioeconomic in opening access, availability, affordability, and guarantee of education, make distance learning attractive to many circles and groups.<sup>12</sup> Even so, the obstacles and problems that arise when implementing this learning must be evaluated and corrected to ensure better implementation of the system, especially for medical students.



The strength of this research is the large number of respondents obtained during the COVID-19 pandemic that applied the distance learning system. This study can also prove several factors related to the medical students' satisfaction toward distance learning during the pandemic. The limitations of this study are the unrepresentative sample taken because of limited access to the internet and the exclusion of self-efficacy variable to determine the association between readiness and satisfaction clearly. For further research, it can be advisable to examine that variable.

Difficulty in learning is a major problem faced by medical students during distance learning. The university origins, grouped by type, region and accreditation, as well as readiness are factors that affect the medical students' satisfaction toward distance learning during the COVID-19 pandemic. Readiness is the most influential factor on the medical students' satisfaction. Although distance learning is a solution to the problems of medical education during this pandemic, the government and related institutions should be able to continue evaluating so that the learning system remains effective and efficient.

## CONCLUSION

Although distance learning is a solution to the problems of medical education during this pandemic, the government and related institutions should be able to continue evaluating so that the learning system remains effective and efficient.

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