THE IMPACT OF COVID-19 ON MEDICAL EDUCATION: OUR STUDENT'S PERCEPTION ON THE PRACTICE OF LONG DISTANCE LEARNING

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THE IMPACT OF COVID-19 ON MEDICAL EDUCATION: OUR STUDENT'S PERCEPTION ON THE PRACTICE OF LONG DISTANCE LEARNING

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Abstract

Medical Faculties also affected by Covid-19 pandemic. To some extent, faculty adminstrator had to improvisize in order to make adjustment, from class based lecture in to long distance/online lecture. Our simple cross sectional, questionairre study aimed to measure the impact of covid-19 on our medical education by asking our student's perception on the practice of long distance learning. The study held during the 1st until 4th week of May 2020. 545 students respondended to electronic survey conducted via WhatsApp™. Our study on the effect of Covid to our student's education revealed some supportive, but also inhibitory factors. To our knowledge, this can be a valuable input to faculty administrator to in order to improve medical education delivery in the future.

Keywords: cost, easiness, improvise, curriculum, Information Technology

Introduction

The initial coronavirus disease 2019 (COVID-19) outbreak, which originally started and limted only in China, has then suddenly alterated into a global pandemic in a very short time. Number of casualties due to this disease still growing and it forces the government of Indonesia to make their best efforts to control and to stop transmission. This rapid change of condition has had serious impact for almost all aspect our lives, including academic/education. Petterson[1] in his book tittled "Learning" stated, as if he had predicted the application of long distance learning (LDL), "*in the future, some teachers may be able to communicate with their students in Multi-media distace education classrooms for interactive distance education and training*".

Physical and social distancing soon implemented by regional leaders/governors across the country, following Mr. President of Republic of Indonesia Joko "Jokowi" Widodo's call for community members to all together to work and study from home, in order to avoid exposure and break the chain of transmission. Considering this disease is very fast growing and without no

doubt is very lethal, especially to those whom already have previous underlying health derangement, public awareness was encouraged through community/public service announcement; the main goal is to educate people so that the community can participate according to the government instruction in order to prevent transmission and eliminate Covid from the society. This is actually a global strategy among countries affected by Covid-19.[2]

Responding to Mr. President's instructions, our institutions named Faculty of Medicine Universitas Kristen Indonesia-UKI (Christian university of Indonesia), one of the oldest, Christian -based private faculty of Medicine located in Jakarta-Indonesia, also has applied an in-school restriction policy at all of the faculties under UKI. This decision meaning that physical attendance of students and staffs to our campus are truly prohibited and we switch learning from class-based in to home-based. All of our students ordered to stay at home and do all of their academic activity without leaving their home. To some extent, sometimes this condition is called long distance learning (LDL). Our daily routine education activities consist of a mixture of class based expert-lecture, tutorials, skill's lab, laboratory work/activity and also students's group discussion and independent self-studying. From these activities, expert-lecture and tutorials were modified to some extent so that both can be done electronically or using the internet.

During the implementation of LDL, we noticed that several factors might influence, positively or negatively, and interfere with the process. This simple study aimed to find out what factors (according to our students's perspective) that can be supportive (positive) and or inhibitors (negative) that can affect our implementation of LDL.

Methods

This simple cross sectional study consist of several steps. First, we conduct a focus group discussion (FGD) to selected numbers of students in order to collect what factors considered by the students to be supportive or inhibitors to the implementation of LDL. The second step is again doing the FGD but this time is to selected numbers of lecturer in order to determine which factors considered to be the real supportive or inhibitory. The third steps continued with creating an electronic questionairre; it divided into four parts: (1) demography, (2) acessibility, (3) supportive factors, (4) inhibitory factors. The fifth step is to test the e-questionairre, making some adjustment and held a small and limited pre-eliminary survey to verify it until we considered it was fixed. We continued with step number sixth which is to disseminate the e-questionairre using Whatsapp™ through the aid of the class leaders that helped us to contact the entire member of the class.

Results

Our active students, pre-clinical phase and clinical phase, due to May 15th 2020, totally in number are 928 students (according to the data of FORLAP DIKTI, a student database in the

Ministry of Research-Technology and Higher Education). The number of 545 respondents responded to the survey and completely fill the electronic questionairre.

Demographic characteristics of our respondents as follows: based on gender, 160 male (29.4%) with mean age 21.20 years old. The number of female respondents are 385 (70.6%) with mean age 20,89 years old. All of our respondents representatives of all our students, from the 1st year/freshmen student to the 6th year students with details number based on 1st/2nd/3rd/4th/5th/6th year in sequences as follows 44/170/61/53/55/162 (in percentage as follows 8.1/31.2/11.2/9.7/10.1%); most of our respondents were 2nd year students (31,2%).

Based on their current location during this LDL and when survey conducted, most of our respondents were still stay in the capitol city of Indonesia named Jakarta and or its surrounding/buffer cities (Bogor, Depok, Tangerang and Bekasi) during this survey held (435/79,8%). Jakarta, Bogor, Depok, Tangerang and Bekasi sometimes called Jabodetabek, an acronim for a wide metropolitan area in the heart of Indonesia. While on the other hand, the rest of the respondents were distributed unequally, from the very western to the last eastern part of Indonesia. This result showed us that our students actually came from all over Indonesia; even though the majority are resident of big major cities Indonesia.

Through all our 545 repondents, their conectivity to internet when LDL conducted was as follows: 174 respondents(31.9%) using cellular data only, 153 (28,1%) using WIFI only and 218 (40%) using combination of cellular data and WIFI. Further analysis based on gender and their current location shown in figure 1.

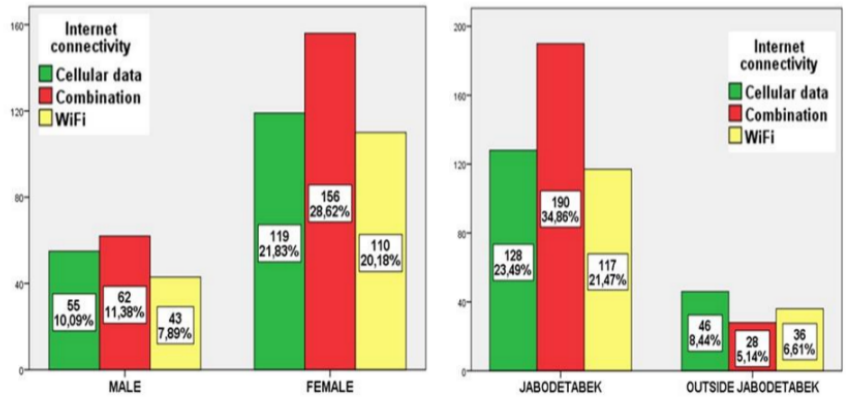

Fig. 1. Type of Internet connection based on gender (left) and their location (right)

From data shown in figure 1, based on our respondent's gender (Fig. 1 left), it seem there was no differences on how our respondents connect to the internet. Male or female respondents use all three types of internet connectivity; most of our respondents, female or female, use the combination of celular data and WiFi to connect to the internet.

But when we try to analyse further, by grouping our respondent based on their location (Jabodetabek or Outside Jabodetabek) and comparing them based on their internet connectivity,

data showed us that the number of our Jabodetabek respondents (34,86%) blessed by having a mixed/combination internet connection, compare to those who lived outside Jabodetabek which rely more on cellular data (8,44%). Maybe, option to have a WiFi connection is more limited to people living outside Jabodetabek, as due to limitation of the internet network in certain areas of Indonesia, or maybe because of financial limitation that prevent them to have a subcsribed WiFi connection.

If some of our students rely more on cellular data without having any back up (e.g WiFi), it means that they are all will be very dependent on certainty and continuity of cellular phone signal. During this difficult time, Indonesia as a nation must work together hand in hand, where each and every stake holder had to succumb and put out their besst effort in order to help and support each other. Some IT/telecomunication provider had provided an internet connection service in a more affordable price. In general, this is a true challange for Indonesia, as it have a very broad area with variation in its geographic spatial. We move further to factors considered by our respondents to be supportive or inhibitory for LDL implementation

Table 1. Factors considered to be Supportive or Inhibitory for the LDL Implementation

Factors	Agree N (%)	Disagree N (%)
Supportive		
• Time flexibility	417 (76.5)	128 (23.5)
• Location flexibility	479 (87.9)	66 (12.1)
• No specific preparation is needed	314 (57.6)	231 (42.4)
• Low cost (except for cellular data)	358 (65.7)	187 (34.3)
• No hassle	321 (58.9)	224 (41.1)
Inhibitory		
• Cost for additional cellular data	431 (79.1)	114 (20.9)
• Signal dependent	437 (80.2)	108 (19.8)
• Time Flexibility is too loose	285 (52.5)	259 (47.5)
• Lack of concentration	423 (77.6)	122 (22.4)
• Lack of understanding	424 (77.8)	121 (22.2)
• Lesson material pilling up	364 (66.8)	181 (33.2)
• Lack of Interaction	343 (62.9)	202 (37.1)
Accompanied by parents	Yes 143 (26.2)	No 402 (73.8)

Table 1 showed us that there are 5 factors considered to be supportive of LDL implementation and 7 factors considered to be inhibitory. Among those 5 factors considered to be supportive to our respondents, location flexibility is the most supportive factor (479 agree/87.9%) but the lowest level of agreement among our respondents on factors considered to be supportive is on the issue of "No specific preparation is needed" (314 agree/57.6%).

On the contrary, among 7 factors considered to be inhibitory for LDL implementation, the most considered as inhibitory is "Signal dependent" (437 of our respondents agree/80.2%) and the least agreement is "Time Flexibility is too loose " with 285 respondents agree (52.5%). During

LDL implementation, most of our students (402 respondents/73.8%) follow this programme without accompanying by parents, eventhough the students were at home. This data showed us about autonomy of older children who learn at higher level of education.

Discussion

This short cross sectional, questionnaire based study showed us how covid pandemic in Indonesia had changed and forced our *civitas academica*, including lecturers, staffs and students, to make so many adjustments in order to make sure the LDL is held in a proper manner, as best as possible.

The data on internet connectivity also informed us about the possibility of challenges to LDL implementation, even in the higher level of education, especially medical education. Eventhough that we are a private medical students, and our students in general came from a middle-up economy level family, but still there was certain limitation when it comes to LDL implementation. Social distancing and limitation of public and economic activities also have direct impact to the financial capability and resilience. Eventhough many studies has stated that the using of IT, with its mobility and personalized benefits, helped lecturer promoting innovation in education, not just limited to the improvement of lecture-style teaching, but also through more humanistic approach in direct open discussion and a more controlled systematic information collection-gathering and sharing among peer- groups.[3]

One of the factors considered to be supportive is flexibility in time and location. In general, this is what IT advancement offers to our lives, which is called easiness. It break almost every partition, with no limitation to dimension. It is users-friendly and easy to operate. This is one of our basic strength in order to fight Covid and still fullfilling our responsibilities as lecturer delivering education to our students. Covid already turning the classic classroom-based interaction, then shifted us to provide individualized instruction for asynchronous learning which can be done anytime/anywhere, limitless.[4] Actually, new age medical schools have been working to alter classic pedagogy approach which rely on big size class, face to face lectures (lecturer centered) in to a more student centered. With the aid of IT tools, medical education nowadays become more personalized by implementing small team-facilitated discussion. Medical students encouraged to do the more active and self-directed learning; and by doing so actually it promoting individualized and in the same time also interprofessional education.[3] Despite the terrible challenges caused by this horrifying pandemic, plenty of resourceful initiatives were already implemented in a trial and error approach, leading to step by step refinement of LDL.[2,5] In a more bigger picture, to our opinion, LDL actually directing medical schools administrator to improve their medical education delivery to their students.

Other supportive factor to be considered is that the LDL implementation is the issue of " not needed specific preparation". Not like giving lecture in class where lecturer had to prepare everything, including and especially him/her self, e.g try to come to class at time, even if it means that he/she should scrambling on a crowded road during peak hour or hanging on a full loaded bus or train, just to make him/her arrive in class at time. With LDL, the lecturer and also the students can stay at home, relax and enjoying the discussion which is held at the exact appointed time/hour. Eventhough 42.4 % of our respondents (231 out of total 545 respondents) still considered disagree with the statement that LDL did not need specific preparation.

This valuable finding is an interesting and valuable information for the administrator, to further seek and define deeper what factors considered to made them disagree in this topics. If lack of understanding on how the LDL runs (e.g does not know how to connect to the internet using specific software like Zoom™ or Microsoft Teams™) it means that the faculty administrator must educating/socializing in more detail to a more limited and specific group. To some extent, faculty IT staff had to setting up.

The very basic role of medical students is to learn medicine from all aspects, since the pre-clinical to clinical phase. But while the COVID-19 pandemic run amok, medical students all over the world only perform as "new kids on the block" learners; their existence in hospitals might added and introduce unnecessary risks, both for patients, clinicians and other hospital staffs. To some extent, medical students considered to be, or at least can act as additional intermediate vectors for Covid-19 transmission. There is fear among health professionals where the presence of not so well trained personal that might use recklessly personal protective equipment (PPE)-items which in actual setting is always limited in number/ availability; hospitals always prone to serious shortages of PPE; and this will further added additional burden on teaching physicians. Considering all of these condition, teaching medical education in clinical settings alone does not justify these horrifying risks.[4-6]

And there is also a consequences of that LDL can be done while everyone stayed at home is the low costness. Because LDL done at home, and every member of the group do not necessary to leave their home means that the costs for e.g gasoline, bus/train ticket, meals, can be reduced to almost naught. The last factor considered supportive for LDL implementation is also as the consequences of stay at home, which is no hassle. Member of the team conducted LDL do not necessary to prepare or to get rush, just as if we did our routine live before Covid. By staying home, all of our attention can be directed fully to LDL, without necessary to share our focus to the road, or traffic etc. LDL to some extent supports fully the idea of social distancing, and might prevent contact and transmission.[2]

On contrary, our student's perception on factors considered to be inhibitory to LDL implementation are as follows. LDL which rely 100% on internet data in the matter of fact is also needed a certain data package/quota. If classes held several times a day, five days a week and if

for each class comprises of 100 minutes, we can imagine how much data quota needed for each individual member of the class in order to stay connected. Eventhough we are a private university, and most of our students come from middle up economy level, but still due to this Covid, some of them were heavily affected. This problem was quite large at the beginning of LDL, but fortunately, our faculty/university also received assistance indirectly from one of the leading IT service providers in Indonesia by providing internet service for students at affordable price. This company provides this kind of service to almost all of education institution, from the very basic level (elementary school) to the higher one (university). This showed the world how Indonesia as a nation faces the problem due to Covid together, in a civilized an noble way.

According to Sahu,[7] university authorities should encourage all of their students, lecturers and other *civitas academica* to keep connected, through the internet/online or any kind of social media platform and keep moving forward together during this extremely difficult time. Students should be provided with clear course instruction and other services in an online format to support academic continuity.[1] Faculty administrator should develop and improvisize on strategies for increasing and ensuring higher levels of pupil engagement in and during online distance teaching/learning.[8] There is positive effects of integrating IT and mobile devices with teaching and learning on students' learning performance, as we can see during the implementation of LDL due to Covid pandemic.[3] Nowadays, artificial intelligence driven by machine learning algorithms is a superior tools that could play a key role by defining the way medicine will be practiced in the future, and there is no better time to start than right now.[9,10]

Other factor considered to be inhibitory is IT/telecomunication signal. Indonesia is a huge country consist of 13,000+ islands with area lies in the heart of equator. Its geographical spatial condition varies from low land to high land and its islands sorrounded with sea, almost ⅔ area of Indonesia is comprises of deep sea. While Indonesia trying hard improving its IT connectedness, we have to admit that in certain areas, due to the geographical limitation, telecommunication signal is quiet hampered. This limitation also become a challenge to us, expecially to the LDL implementation, which rely 100% on IT connectivity; this is where challenges become opportunity when initiatives and improvement were implemented, and it all leading to yhe progression of education delivery.[3,10] For example, Moszkowicz and his cooleagues,[11] which improvisize their daily medical education for their affcted students during COVID-19 pandemic by using a simple and widely available videoconference solution to teach the students about set up a daily medical education procedure. According to them, This video conference method can also be applied to other type of routine clinical procedure as well as gross anatomy lessons. To make the statement simple, everyone encouraged to put out their best effort in order to make yjis LDL works.

Other factors considered to be inhibitory can be classified in general as student's own intrinsic factors, which are (1) time flexibility is too loose (285 agree/52.5%), lack of concentration (77.6% agree/ 423 out of total 545 respondents) and lack of understanding in terms of the lesson

(77.8% agree/ 424 out of total 545 respondents). This results informed us, the administrator, that further and continous character building must be applied to our *civitas academica*, especially to our students. Universitas Kristen Indonesia adhere to the values of Christian nobility. One of our christian values is discipline. By teaching discipline to our students, since the very basic, we hope that in the future, they will become a good and responsible doctors. Discipline is one of the basic criteria for our students. Because in Medical education, it become of common knowledge to the society that the process of teaching medical student to become a doctor take a long time, very hardwork and a lot of effort (physically, mentally and do not forget to mention financially). Without discipline, it is almost impossible for someone to become a doctor.[5,8] even in the United States, medical schools have implemented curricular reforms to address issues of character in their medical education and according to a study conducted by Carey et al,[12] US students in clinical clerkships receive predominately positive feedback from educators regarding character traits. Characters is something that is learned directly through a teacher-student contact.

The side effect of prolonged implementation of LDL also give the students a lot of lesson materials; and the potency of it become pilling up. Again, without good learning management, it will probably become a kind of time bomb which is ready to blow anytime. The result of this study also revealed that, students that agree on the terms "Material lesson pilling up" were most in the 1st and 2nd year, and as they reach higher level, the percentage is getting lower (data not shown, analysis conducted by crosstabs in descriptive statistics). This indicates that, as they become a senior students, they become more wiser and more discipline. Further analysis of this gap would be an interesting insight for the adminstrator, in order to update and improve the delivery quality of education. Strategies for online engagement of students where their geographic position are quiet remote must be carefully assesed and perhaps this needed a specialized/tailor made approach.[1,3]

The last but not least, factor considered to be inhibitory as the perception of our students on the impementation of LDL is lack of interaction (62.9% agree/343 out of 545 respondents). This should become an important tools of mesage to the administrator. Eventhough this is subjective, but still it give a clue that direct human interaction are still and always needed in the area of education, especially in Medicine. In general, this is a limitation for IT advancement, because eventhough IT can do barely almost everything in our lives, but still it cannot replace human touch and humanity. Humanity belongs to living human, and not machines (no matter how advance and sophisticated the machine).[7] This a challenge to the administrator to improve, or to insert more humanistic approach to the implementation of LDL.[10]

Until the time we submit this paper, Covid still continues in our country Indonesia and raises particular concerns and questions for medical Faculties all over our archipelago. In pre-clinical term, close contact among students and lecturers can occur during lecturer, lab work/activity, tutorials and skills lab while in the term of clinical phase of our students, frequent rotations between departments and hospitals make medical students very prone to be potential vectors for

COVID-19. Again, specific strategies must be carefully prepared before re-opening of our medical schools.

The way we protect our students by implementing LDL, as the goverment's instruction, also give us not only challenge but opportunity as well.[4-6] We have to give our best effort all the time, to make sure that the delivery of education to our students are continously controlled and quality is maintained.

Conclusion

Our study on the effect of Covid to our student's education revealed some supportive, but also inhibitory factors. These factors can be challenging, but in the other hand to our knowledge as administrator is considered as an opportunity to improve our medical education delivery to our students.

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