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Perceived Barriers in Online Learning among Nursing Students during the COVID-19 Pandemic in Indonesia

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Abstract

BACKGROUND: In March 2020, nursing schools in Indonesia were forced to abruptly shift from face-to-face learning to fully online learning due to the COVID-19 pandemic. Before the pandemic, fully online learning was still not widely used in Indonesian nursing education.

AIM: This study aimed to identify barriers in online learning among Indonesian nursing students during the COVID-19 pandemic.

METHODS: This study used a cross-sectional design and involved 530 undergraduate nursing students from five universities in Indonesia participated in this study. The authors sent an online self-administered questionnaire to nursing students from October to December 2020. The questionnaire consisted of four sections to obtain the following data: (1) Sociodemographic characteristic, (2) information about online learning, (3) platform used for online learning, and (4) perceived barriers in online learning. Descriptive statistics were used to analyze data with frequency distribution, percentages, means, and standard deviations.

RESULTS: Nursing students in Indonesia were confronted by various barriers during the implementation of abrupt online learning in the current pandemic situation. Most frequently barriers encountered by nursing students during online learning were high costs for online learning, poor internet connection, lack of motivation toward online learning, lack of skill in using the online learning platforms, and lack of training and assistance to use the platforms.

CONCLUSION: High cost for online learning, poor internet connection, low learning motivation, lack of skill in using the online learning platforms, and lack of training and assistance to use the platforms were identified as the most frequent barriers encountered by nursing students.

Introduction

In December 2021, the highly pathogenic novel human coronavirus disease 2019 (COVID-19), also known as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), was first identified as a pathogen causing severe pneumonia in Wuhan, Hubei Province, China [1]. SARS-CoV-2 is a highly virulent positive single-strand RNA virus [2], [3] with a potent virulence factor and multiple routes of transmission, allowing its rapid transmission from human to human. A previous study suggested several main routes for viral transmissions such as direct droplet transmission and contact transmission [4]. Due to the high rate of spread of SARS-CoV-2, in early March 2020, the World Health Organization declared COVID-19 as a global pandemic [5].

The enforcement of social distancing rules was identified as an essential strategy to prevent SARS-CoV-2 transmission and to help control the pandemic situation [6]. Social distancing and lockdown policies have been widely implemented in many countries including in Indonesia [7]. In a unified response, the *Ministry of Education and Culture* of Indonesia implemented an online learning policy to prevent COVID-19 transmission in the education sector [8]. As a result, all nursing education institutions were forced to shift into full online learning with or little preparation in terms of internet access, teacher capacity, and student-parent readiness. Research shows that the impact of the COVID-19 pandemic in nursing education in developing countries may be greater than in developed countries [9]. Higher education institutions in developing countries face infrastructural barriers, including lack of appropriate technological infrastructures, lack of internet accessibility, and lack of resources and facilities [10]. Indonesia is a developing country with the rapid development of information and communication technology infrastructure, but in the past three decades,

it has experienced unequal regional development of information and communication of technology [11].

Online learning in nursing education has several unique challenges, such as providing nursing students with online learning experiences that simulate real-world clinical practice [12]. Before the pandemic, fully online learning was not widely used for nursing education in Indonesia with only a small number of schools that implemented blended learning in their curriculum. The COVID-19 pandemic was the very 1st time for most of the nursing education institutions in Indonesia to implement full online learning in their teaching and learning process. Lack of experience in delivering full online learning programs before the pandemic caused nursing education institutions in Indonesia to face greater challenges during the launching of the new online learning implementation.

Electronic or online e-learning is defined as the utilization of information and communication technology to deliver learning and teaching processes [13]. Online e-learning as any other kind of education has specific barriers which should be known and considered [14], [15]. Based on a previous study, the potential barriers to online learning are multifactorial [16]. It must be highlighted that these studies evaluated barriers in online learning not in the pandemic situation under controlled circumstances and not due to the sudden shift from face-to-face learning into full online learning in the current pandemic crisis. The students' perceptions regarding their online learning experiences may contribute to several negative impacts such as low learning effectiveness, low motivation to learn, lower student satisfaction with the learning experience [16], and higher dropout rates [17].

It is important to identify the barriers encountered by students as a result of this sudden switch from traditional face-to-face learning to an online platform during the COVID-19 pandemic, especially in developing countries, where the full online e-learning approach is still not widely used. To the best of our knowledge, research regarding this topic is still limited. More importantly, previous research intending to evaluate barriers in online learning implementation in developing countries only focused mostly on technological barriers (e.g. cost, access, and software design), hence often failing to identify more comprehensive information regarding potential barriers [18]. It is essential to identify any additional barriers that act on and hinder successful online learning implementation, which may not have been identified in previous research [19]. A more comprehensive understanding of these barriers could help nursing institutions and educators to develop more comprehensive pedagogical approaches that can address those barriers and increase the likelihood of successful online teaching and learning. This study aimed to identify and describe barriers in online learning encountered by Indonesian nursing students during the COVID-19 pandemic.

Materials and Methods

Study design

This was an observational study with a cross-sectional design. Data were collected between October and December 2020 using an online self-administered questionnaire which created using Google Forms and distributed through WhatsApp messenger service. Before sending the online questionnaire to the participants, all of them were contacted through telephone to explain about the information and purpose of the study and asked for their willingness to be involved in the study. If the students agree to involved in the study, we sent the Google Forms link that contained an information about the study, eligibility criteria, and informed consent as a prerequisite for further participation in this study. After the students declared their willingness to participated in the study by filling the online informed consent through Google Forms link, we sent another Google Forms link that contained research questionnaire. All the participants were instructed to fill the form completely.

Sample

This study was conducted in five universities in the Special Region of Yogyakarta, Central Java and East Java Province, Indonesia. These universities were being closed during the COVID-19 pandemic, never implemented an online learning before pandemic, and had students from various region of Indonesia. The minimum sample size was determined by Slovin's formula stated as $n = N/(1+N)$ [20], [21], in which n = sample size, N = population size, and e = margin of error. In this study, N = 1798, e = 0.05, and the minimum number of participants $n = 1798/(1+1798) = 327$. A total of 530 undergraduate nursing students participated in this study. The eligibility criteria for the students to participate in this study were as follows: Active undergraduate nursing student; residing in Indonesia during the COVID-19 pandemic; and have been engaged in online learning (minimum duration 1 month).

Ethical considerations

This research was approved by the Medical and Health Research Ethics Committee, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia, with the ethical expediency number KE/FK/1067/EC/2020. Informed consent was acquired from the participant before starting the study. The confidentiality of participants identity and information was assured.

Instrument

The instrument was created using *Google Forms* provided by Google™. The study questionnaire

consisted of four sections. The first section was the questionnaire about sociodemographic characteristics which was adapted from the previous study [22]. This section consisted of six questions about gender, age, residential area during COVID-19 lockdown, monthly family income, type of academic institution, and academic level.

The second section was a questionnaire to assess the information about online learning during the COVID-19 pandemic which was adapted from study conducted by Kapasia *et al.* [22]. This section was comprised five questions about the place of residing during online classes, frequency of online classes per week, type of gadget used for attending online classes, source of the internet connection used for online classes, and history of online learning before the COVID-19 pandemic.

The third section was a questionnaire to assess the type of platform used for online learning which was adapted from the previous research [22]. This section included a list of 10 platforms that can be used for synchronous or asynchronous online learning activity from which the students were able to choose all that applies to their situation and to add any online platform that was not listed among the choices using the option "others, please specify." We included all platforms used for online learning during the COVID-19 pandemic identified in a previous study [22] as well as the learning management system used specifically in each of the student's institutions/university/college.

The fourth section was a questionnaire to evaluate the nursing students' perceived barriers in online learning. We adapted the questionnaire to evaluate barriers in online learning from Muilenburg and Berge's study [16] and Marcial *et al*. study [23]. The questionnaire comprised 25 items and evaluated seven domains of barriers in online learning. Each item had 4 answer choices as follow: Never, sometimes, often, and always.

Statistical analysis

Descriptive statistics were used to analyze the data. Frequency distribution and percentage with mean and standard deviation (SD) were used to report the data about participant sociodemographic characteristics, information about online learning, and perceived barriers related to online learning during the COVID-19 pandemic. All the analyses were performed using the SPSS v.23 (IBM Corp, Armonk, NY).

Results

Participant's characteristics

The characteristics of the participants are shown in Table 1. The mean age was 19.92 years (SD = 1.23) and ranged between 17 and 24 years. The majority of participants were female (n = 432, 81.5%), resided in rural area (n = 277, 52.3%), and had a monthly family income between IDR 1 and 2 million (n = 170, 32.1%). Most of the participants were the 3rd year students (n = 241, 45.5%) and from the private university (n = 409, 77.2%).

Table 1: Characteristics of the study participants (n = 530)

Characteristics	Frequency (n)	Percentage (%)
Age of the student (years)	19.92 (1.23)	
17–20	391	73.8
21–24	139	26.2
Sex		
Female	432	81.5
Male	98	18.5
Residential area		
Rural	277	52.3
Urban	253	47.7
Monthly income of the family (IDR)		
Under 1 million	86	16.2
1–2 million	170	32.1
2–3 million	104	19.6
3–4 million	51	9.6
4–5 million	51	9.6
Above 5 million	68	12.8
Institution		
Public university	121	22.8
Private university	409	77.2
Academic level		
First year	68	12.8
Second year	140	26.4
Third year	241	45.5
Fourth year	81	15.3

Mean (SD)

Information about online learning

The majority of the students (n = 422, 79.6%) reported that they were staying in their own homes during the online class. Most of the students (n = 481, 90.8%) were attending online classes more than 3 days/week. Based on the type of gadget for attending online learning, the majority of nursing students (n = 246, 46.4%) used both Android mobile phones and laptops/computers for attending online learning. Another 200 (37.7%) students used their Android mobile phones only for attending online classes, making it the most popular tool to attend online classes among Indonesian nursing students. Most of the respondents (n = 396, 74.7%) used a mobile hotspot as a source of internet connection for online learning. The vast majority of the students (n = 509, 96%) attended online classes with their gadgets. Most of the students (n = 379, 71.5%) reported that they had never attended online learning before the COVID-19 pandemic. More details about the information related to online learning during the COVID-19 pandemic are provided in Table 2.

A platform for online learning

Information about the platform for online learning used for teaching and learning activity during the COVID-19 pandemic is provided in Table 3. Our study demonstrated various platforms used by nursing students. The majority of the students (n = 304, 57.4%) used more than 3 platforms for an online class. Interestingly, the vast majority of the students

Table 2: Information about online learning

Variables	Frequency (n)	Percentage (%)
Place residing during online classes		
Home	422	79.6
Boarding house/dormitory	71	13.4
Relative house	7	1.3
Outdoor area	11	2.1
Neighbor house	2	0.4
Public internet facility	17	3.2
Online classes attended per week		
Above 3 days/week	481	90.8
3 days/week or less	49	9.2
Gadgets for attending online classes		
Smartphone/android mobile	200	37.7
Laptop/computer	84	15.8
Both of them	246	46.4
The primary internet connection source		
LAN	5	0.9
Mobile hotspot	396	74.7
Wifi	129	24.3
Possess of gadgets for online classes		
Own	509	96
Hired from family members/neighbor	21	4
Attended online classes before the outbreak of COVID-19		
Yes	151	28.5
No	379	71.5

(n = 485, 91.5%) used the Zoom application (app) for attending online classes. This finding is suggesting that the Zoom app is the most popular and widely used platform for online nursing education during the pandemic in Indonesia.

Table 3: Platforms for online learning

Platforms	Frequency (n)	Percentage (%)
Platforms for online classes based on the number		
Single platform	89	16.8
2–3 platforms	137	25.8
>3 platforms	304	57.4
Platforms for online classes based on the type		
Zoom	485	91.5
Google Classroom	322	60.8
Google Meet	211	39.8
Skype	2	0.4
Team Link	18	3.4
Webex	98	18.5
Schoology	84	15.8
YouTube	113	21.3
WhatsApp	396	74.7
Learning management system	159	30

Perceived barriers related to online learning

Our study demonstrated that nursing students in Indonesia experienced various barriers in online learning during the current COVID-19 pandemic (Table 4), and we also demonstrated the most frequent barriers experienced by nursing students in each domain.

In the administrative/instructor issues domain, our study found that a significant proportion of the students has reported insufficient training to use the online learning platforms. As many as, 219 students (41.3%) reported that they *often* get insufficient training to use the platforms. This finding suggested that insufficient training about online learning platforms was one of the most prominent barriers in the administrative/instructor domain faced by students.

In the social interaction domain, most of the students reported that they *seldom* experienced a lack of interaction and lack of collaboration during online classes (46.4% and 47.2%, respectively). In the technical skills domain, most of the students (n = 262, 49.4%) reported that they *often* experienced a lack of skills in using online learning platforms. Our study found that this lack of skill in using the online platform was one of the most frequent barriers reported by students in the technical skills domain.

In the learner motivation domain, our study found that a lack of motivation in online learning was one of the most prominent barriers reported by students. Our study demonstrated that half of the students reported that they *often* feel unmotivated to attend online classes. The majority of the students (n = 261, 49.2%) often experienced insufficient time to learn during online learning. This finding suggested that insufficient time to learn during online classes was one of the most frequent barriers reported by students, in the time and support for studies domain.

In the cost and access to the internet domain, our study identified the lack of adequate internet access and high cost for online learning as some of the most prominent barriers. The vast majority of the students (n = 332, 62.6%) *often* have a poor internet connection during online learning. Besides poor internet connection quality, the expensive cost for an internet connection was also identified as a prominent barrier in online learning among Indonesian nursing students. The large majority of the students (n = 250, 47.2%) *always* feel that internet connection is expensive.

In the technical problem domain, lack of technical assistance in using online learning platforms is one of the most frequent barriers reported by nursing students. As many as, 217 (40.9%) students reported that they *often* did not receive adequate technical assistance when facing difficulties and troubles in using an online learning platform.

Discussion

Our study demonstrated that most of the nursing students were attending online learning from their homes (79.6%; Table 2). The previous studies also demonstrated that most university students stayed at their own homes with their family members during the initial stage of the COVID-19 pandemic [22], [24]. Students tended to move back to their own homes as the university residences were closed, which could reduce their living expenses. Most students have no experience in conducting online learning before the pandemic (71.5%; Table 2). Before the pandemic, fully online learning was not widely used for nursing education in Indonesia with only a small number of universities that implemented blended learning in their curriculum. Most of the students are accustomed to using their smartphones to attend online classes (Table 2). The

Table 4: Student's barriers related to online learning during the COVID-19 pandemic

Barriers	Never		Sometimes		Often		Always	
	f	%	f	%	f	%	f	%
Administrative/instructor issues								
Online learning not delivered on time	131	24.7	219	41.3	174	32.8	6	1.1
Instructors do not know how to teach online	199	37.5	257	48.5	71	13.4	3	0.6
Course materials are not always delivered clearly	153	28.9	250	47.2	126	23.8	1	0.2
Difficulty contacting academic or administrative staff	152	28.7	220	41.5	142	26.8	16	3.0
Lack of timely feedback from the instructor	146	27.5	262	49.4	115	21.7	7	1.3
Insufficient training to use the online learning platforms	29	5.5	70	13.2	219	41.3	212	40.0
Social interactions								
Lack of interaction/communication among students	58	10.9	246	46.4	159	30.0	67	12.6
Lack of student collaboration	52	9.8	250	47.2	157	29.6	71	13.4
Prefer self-learning rather than online learning	166	31.3	255	48.1	79	14.9	30	5.7
Technical skills								
Fear computers and technology	303	57.2	160	30.2	52	9.8	15	2.8
Lack skills for using the delivery system	61	11.5	190	35.8	262	49.4	17	3.2
Fear different learning methods used for online learning	208	39.2	233	43.9	70	13.3	19	3.6
Learner motivation								
Procrastinate, cannot get started	151	28.5	254	47.9	101	19.1	24	4.5
Lack of personal motivation for online learning	87	16.4	129	24.3	265	50.0	49	9.3
The online learning environment is not inherently motivating	99	18.7	248	46.8	131	24.7	52	9.8
Time and support for studies								
Online learning cuts into my time	190	35.8	189	35.7	105	19.8	46	8.7
Lack of support from family and friends	256	48.3	148	27.9	105	19.8	21	4.0
Significant interruptions during study at home/work	80	15.1	198	37.4	161	30.4	91	17.2
Insufficient time to learn during online courses	72	13.6	183	34.5	261	49.2	14	2.6
Cost and access to the internet								
Lack of adequate internet access	19	3.6	140	26.4	332	62.6	39	7.4
Online learning costs too much	31	5.8	98	18.5	151	28.5	250	47.2
Needed technology is not available	246	46.4	195	36.8	89	16.8	0	0.00
Technical problems								
Lack of consistent platforms, browsers, software	127	24.0	252	47.5	140	26.4	11	2.1
Incompatibility creates technical problems	254	47.9	181	34.2	77	14.5	18	3.4
Lack technical assistance	75	14.2	138	26.0	217	40.9	100	18.9

smartphone is becoming a popular learning tool that supports distance education. Smartphones are "the handheld computers" that can be used for various educational purposes, allow flexible course delivery, and allow teacher and learners to interact digitally. Moreover, smartphones also have a reasonable internet connection cost for online learning purposes [25].

In our study, most of the students (91.5%) used Zoom video conference as an online learning platform (Table 3). Distance learning is characterized by the separation of place and/or time between teacher and learner and learning resources during teaching and learning activities. Distance learning environments can be divided into a triad of synchronous, asynchronous, and hybrid learning environments [26]. Utilization of Zoom video conference as asynchronous audio and video telecommunications technology allowing teachers and learners to interact with each other from two or more separate locations [27].

In this pandemic era, distance education has an increasingly important role in nursing education not only in developed countries but also in developing countries. Similar to traditional education, distance education has its barriers and necessities which should be considered for achieving learning outcomes [14]. The previous studies suggested that barriers in online learning are multifactorial [14], [16] and should be determined before implementation of online learning. Our study demonstrated that the lack of skills in using the online learning platforms is one of the most frequent barriers in the administrative/instructor issue domain, for which 262 students (49.4%; Table 4) reported that they *often* experienced it. It might be caused by a lack of training to use the online learning platforms before the online course. In this study, we identified that insufficient training to use online learning platforms is the most prominent barrier in the administrative/instructor domain faced by students (Table 4). Insufficient training in using online learning platforms for the students results in insufficient ability to understand the technology used during online learning and may lead to an ineffective teaching and learning process. Moreover, most of the students in this study had never attended online learning before the pandemic. Choi *et al.* demonstrated that student's online learning experience affects online learning self-efficacy [28]. Another study showed that experience in online learning influenced online learning self-efficacy and perceived ease of use [29]. de la Varre *et al.* identified that issues related to online learning technology as an important factor that contributed to students dropping out from online courses [17]. When most students reported a lack of skills in using online learning, they also reported the lack of technical assistance in using online learning platforms (Table 4). Lacked skills in the use of technology could hinder students' learning process [30]. Without immediate assistance when they face difficulties and troubles during online classes, they might get frustrated and experience a level of anxiety [31]. Problems with the online learning platform also contributed to confusion and lower confidence or motivation among students [17]. To overcome these difficulties, workshops or training regarding the pedagogical and technological competencies in online learning were essential for both teachers and learners [32].

We found that about half of the students reported that they *often* feel unmotivated to attend online learning (Table 4). A previous study conducted in the early phase of the COVID-19 pandemic found that

the majority of university students had no motivation toward online learning [33]. Growing evidence identified motivation as a critical factor for online learning success [34]. Distance learning can become a lonely experience where students have to motivate themselves and overcome the barriers with less support from peers and teachers [35]. Considering the importance of motivation in online learning, we suggest the need for further investigation to better understand the factors that affect students' motivation in online learning.

In our study, most of the students reported that they seldom experienced a lack of interaction and lack of collaboration during online learning (Table 4). This is suggesting that synchronous video conferences encouraged social interactions during online learning. A previous study reported that synchronous online learning had a positive impact on students [36], [37], [38]. Synchronous video conferencing encourages social interaction, which can add a human touch to online learning and decrease the psychological distance between students [39]. Park and Bonk found that students preferred synchronous learning because it allows meaningful interactions and provides spontaneous feedback as well as higher instructors' support [38]. Synchronous online learning allows teachers to develop connection with and among students more effective and to increase the potential for interaction [37]. In another study, synchronous communication increased students satisfaction [36].

Although using synchronous video conference has many advantages in the online learning process, the utilization of this method in developing countries may have several challenges, such as internet connection quality. Our study revealed that the vast majority of students reported poor internet connection during online learning (Table 4). Most of the students are using mobile hotspots as their internet connection source (74.7%; Table 2) and living in the rural areas (52.3%; Table 1) which might contribute to an unstable internet connection. These findings suggest that poor internet connection is an important barrier during distance learning in a developing country setting. A previous study found that the inequality of internet access in Indonesia was primarily observed in rural and remote island areas [11]. Since most of the participants are using Zoom video conferences for online learning, the availability of good internet connections is crucial. The disadvantage of synchronous learning is that it may be less accessible to students since it needs the availability of a good bandwidth in the internet connection [26]. Most of the participants (47.2%) reported that they *always* spend a significant amount of money to attend online learning (Table 4). The majority of the families (32.1%; Table 1) have IDR 1–2 million income for each month, suggesting poor economic status. This finding showed that in a developing country, online learning opportunities are not equally accessible and the students from poor households are at some disadvantage in accessing online learning.

This study has several potential limitations. All data were collected using an online questionnaire due to the social distancing policy. Besides, this study also used a self-developed questionnaire, due to the urgent need to gather data during the initial phase of the COVID-19 pandemic in Indonesia. Nevertheless, our study provides important contributions to the growing literature regarding the barriers during the implementation of abrupt online learning amid the COVID-19 pandemic from the perspectives of nursing students, especially in a developing country setting.

Conclusion

High cost for online learning, poor internet connection, low motivation toward online learning, lack of skill in using the online learning platforms, and lack of training and assistance to use the platforms are the most frequently encountered barriers by nursing students. Appropriate interventions that address these barriers are urgently needed for ensuring the highest nursing education delivery during the pandemic.

Ethical Approval

This study was approved by the Medical and Health Research Ethics Committee (MHREC), Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Indonesia, with the ethical expediency number KE/FK/1067/EC/2020.

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