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Technological Challenges in Online Learning During Covid-19 Pandemic: A Focus Group Discussion Exploring Nursing Students' Perspectives

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Abstract

In nursing education, the use of technology can have a significant influence on the online learning process. However, in the Covid-19 pandemic era of nursing education, many challenges in online learning were encountered. Within this context, the present study aimed to explore undergraduate nursing students' perceptions regarding the technological challenges in online learning during Covid-19 pandemic. A qualitative study was conducted using zoom focus group discussions synchronously with the help of a discussion guide consisting of five open-ended questions. Overall, 34 nursing students were recruited using a maximum variation sampling technique; these students then participated in four focus group discussions. All interviews were recorded, transcribed verbatim, and analyzed for thematic contents using the standard created by Kyngas content analysis framework. A thematic content analysis yielded four core themes: (1) technical issues, (2) technology cost, (3) inexperience in ICT, (4) clinical learning issues. The seven sub-theme emerged: (1) incompatibility technological devices, (2) unstable internet connectivity, (3) purchase adequate technology devices, (4) purchase additional study quota, (5) students' new experience, (6) faculties' new experience, (7) inadequate clinical learning platform. Technological challenges were encountered in online learning during Covid-19 pandemic. This represents a significant picture perceived by nursing students. The challenges in online nursing education should be rigorously evaluated to monitor its effectiveness.

Keywords: Focus group discussion, Nursing students, Online learning, Technological challenges

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1. INTRODUCTION

Online learning implementation has been mandatory due to the global Covid-19 pandemic since 2020 (WHO, 2020). The Indonesian government through the ministry of education and culture has enforced an online learning policy (Kemdikbud, 2020). Learning that previously used face-to-face methods in the classroom, in the laboratory and on the practice field was replaced by the use of virtual media. The use of technology is a requirement in online learning, where learners and educators are in different places (Sadeghi, 2019). Several learning technologies were utilized such as web based learning, computer-based learning, virtual schoology, virtual classroom and various other applications (Sundari and Utomo, 2019).

The use of online learning is less popular in Indonesia, nevertheless. There were very few online learning programs before the Covid-19 pandemic. In the last three years prior to the Covid-19 pandemic, the education system in Indonesia had just started to adopt online learning (Divayana et al, 2017; Kidi et al, 2017). In its development, the use of various technology-based learning designs has not been optimal in its utilization (Ningsih & Mulyono, 2019). Until then online learning became compulsory in the era of the Covid-19 pandemic.

Some research results show that there are various challenges faced by scholars in the online learning process, including technological challenges. Technological challenges include the limited internet connection that many nursing students experience during online learning (Bdair, 2021; Rahiem, 2020). In addition, there are also limitations to the technological equipment needed to facilitate an effective learning process. Availability of technology tools to support online learning and the ability to use technology in learning are also issues in online learning (Hasan, 2020; Silva et al, 2021).

However, previous studies have shown that online nursing education is effective. In many developed and developing countries, online nursing education is becoming a trend (Rao, 2019). As a tool for teaching and learning, technology has a stronger impact on nursing education. Since the development of cutting-edge technology, computers are used in every aspect of healthcare. As more material is made available online, nursing research improves in quality (Damar,2022). On the other hand, the high tech, high touch nursing approach was created to maintain the human element of nursing care without weakening the technical breakthroughs in the area of patient care. With the aid of cutting-edge equipment and technology, nursing education today equips students to maintain the human component of patient care (Waidley, 2019). Therefore, the ability of scholars to use technology in higher education is something that is very important(Castro, 2019).

In nursing education, the use of technology can have a significant influence on the online learning process (Hübner et al, 2018). It can increase autonomy in the process of seeking knowledge, assist the apprehension of content, support clinical decision making and improve the quality of nursing care delivery (Alves, et al, 2020; Mantas & Hasman, 2017. Yet, in the Covid-19 pandemic era of nursing education, many challenges in online learning were encountered. It is necessary to explore various technological challenges in nursing education at one of the private universities in Indonesia. The aim of this study was to explore the nursing

students' perspectives toward the technological challenges in online learning during the Covid-19 pandemic. This exploration can serve as a recommendation for the development of online learning in nursing education.

2.   RESEARCH METHOD

This study used a qualitative online focus group design for a number of reasons. First off, this design makes it possible to interactively and thoroughly explore respondents' experiences (Creswell, 2014). Second, a group discussion can aid in the clarification of opinions that may not come out in a one-on-one interview. Additionally, it might reveal voluminous opinions people have about a subject as well as perception gaps between people and groups (Polit and Beck, 2018). Discussions in focus groups were therefore the best option for efficiently addressing the goals of our study. Due to the ongoing Covid-19 pandemic, Indonesia's social isolation, and the fact that it was more affordable, the conversations were held online. Additionally, it made sure to thoroughly probe participants' perspectives, expectations, and challenges and was designed to produce suggestions for changes and testable hypotheses for future research (Hennink, Kaiser and Weber, 2021).

The participants were selected purposely. To ensure sufficient diversity of opinion among groups, nursing students in their first years through final year, studying at the Faculty of Nursing in one of the private universities in Bandung, West Java, Indonesia, were recruited using a maximum variation sampling technique (Hennink, Kaiser and Weber, 2021). The participants were chosen using a sampling frame made up of the names of nursing students from diploma and bachelor programs. A call was made to each class's leader, from the first-year class to the last-year class. Because they had a direct line of communication with the teachers and their students, class leaders were chosen first. As a result, they served as connectors, and those class leaders assisted in the selection of other participants. Each student was informed of the history of the study and given the opportunity to take part upon initial contact. Overall, 34 nursing students participated in four focus group discussions, and each group had eight to nine participants. A satisfactory (11/23) male-to-female participants ratio was maintained in discussions. Discussions in focus groups went on until there was no more new information to discuss.

Students who choose to take part in the study were sent an email with instructions on how to use the forum for online focus groups and a discussion guide to spark conversation. To access the forum, each of them received a zoom link. The recording was solely available to the moderators for the purpose of data collection. Along with the secrecy and security of the data, it was made sure that all statements on the transcripts and in the final report were anonymous. Participants gave informed consent via personal email because data collection took place on the Zoom meeting platform, and they had the option to resend the signed form once they had read all pertinent information.

The discussion guide for the zoom focus groups was created by the authors in collaboration with subject matter experts for this study. After being tested with four students, the guide was amended, approved, and released by all authors. Five open-ended questions made up the survey, allowing participants to talk about as many topics as they liked. The focus group discussions were conducted during the months of July and October 2022 by dual moderators.

Each group's forum began with an introduction, after which questions regarding participants' experiences with technological challenges in online learning, device usage, internet connection for learning engagement, financial resources for purchasing quotas, and information and communication technology (ICT) skills were posed. Each focus group's students engaged in a live, synchronous discussion via the Zoom platform. Audio recordings of the conversations were made. There were two moderators: one made sure the focus group meetings went smoothly, and the other made sure all the relevant subjects were covered. Focus groups led by two moderators produced sessions that were quite fruitful. Between 60 and 90 minutes were spent on each group discussion. The moderators concurred that saturation had

been reached during the final focus group session and that adding additional respondents was no longer essential.

Discussions were recorded, verbatim transcribed, and then evaluated using a summary content analysis technique (Kyngas, Mikkonen and Kaakiainen, 2020). As a result, the information was systematically reduced to its essentials via a set of sequential stages. Based on the discussion questions, the major themes of the data were identified. Each significant sentence was given a code using an inductive analysis procedure, and then comparable codes were collected into overarching sub-themes. In the end, related sub-themes were collected into a major topic that reflected those sub-themes. All authors participated in the data analysis and coding. A preliminary analysis was carried out by two writers, who also served as second coders for the data. The preliminary coding was then examined and contrasted. It was then debated and improved upon until the authors came to an agreement, which resulted in a more representational coding scheme, sub-themes, and themes.

Lincoln and Guba criteria were taken into account in order to ensure the study's objectivity (Lincoln and Guba, 1985). Methods like a member check were employed for credibility so that the interview text was returned to the participants after coding, and the researcher wants to make sure that has obtained the correct idea. A qualified research team with significant expertise in qualitative research, management, and ethics also kept an eye on the coding and analysis of the data. The sampling of nursing students likewise revealed the highest degree of variation. In order to make the research more applicable, the researcher made an effort to record every step of the process, including data collecting, analysis, and the classification of themes and sub-themes that are fully quantifiable by others.

This research was approved by the Ethics Review Committee of Fakultas Ilmu Keperawatan UNAI no.227/KEPK-FIK.UNAI/EC/IV/22. This study adhered to the principles of the Helsinki (Declaration World Medical Association Declaration, 2014). The participants were taken into account when applying the ethical norms of autonomy, secrecy, and anonymity. All participants were required to give oral and written informed consent in order to be included in the study, and participation was voluntary. A guarantee of the interviews' secrecy and the participants' anonymity was given to the participants. Also implemented in an anonymous manner with a code was the interview text. Additionally, when presenting the findings, the citations' anonymity was taken into consideration.

3. RESULTS AND DISCUSSION

In total, four online zoom focus group discussions were conducted. Each group included eight to nine participants. There were 34 responses in all, and women made up more than half (68%; n=23) of the participants. The approximate male/female nursing students' distribution within Diploma and Bachelor nursing programs of Faculty of Nursing Science at one of private universities in Bandung, Indonesia is 9/25. Almost half of the participants (44%; n=15) were between 22 and 23 years old. Almost three fourth of the participants (73%, n=25) resided in urban and suburban areas, as indicated in Table 1.

Table 1 Characteristics of the study respondents (N = 34)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
<21	8	24
21-23	15	44
23-24	6	18
>24	5	14
Gender		
Male	11	32
Female	23	68

Educational Status		
First year	8	24
Second year	8	24
Third year	8	24
Fourth year	10	28
Residence		
Urban and suburban area	25	73
Rural area	9	27

Four major themes were found during the analysis, and their respective sub-themes are listed below. The four core themes included the following: (1) technical issues; (2) technology cost; (3) inexperience with ICT; (4) practical learning issues as indicated in Table 2.

Table 2 Summary of themes and sub-themes

Themes	Sub-themes	Description
Technical issues	Incompatible technological devices	Incompatible technological equipment as an online learning hindrances
	Unstable internet connectivity	Unstable internet connection disrupts the online learning process
Technology cost	Purchase adequate technology devices	purchase adequate technology devices to support online learning
	Purchase additional study quota	Buying internet quota when the learning quota provided by the government runs out
Inexperience in ICT	Students' new experiences	Inexperience of students using ICT at the beginning of online learning implementation
	Faculties' new experiences	Inexperience of faculty at the beginning of online learning implementation
Clinical learning issue	Inadequate clinical learning platform	Inadequate technology to facilitate online clinical learning

Theme 1: Technical issues

The technical issues in online learning identified by the respondents are discussed under two sub-themes, including (1) incompatible technological devices and (2) unstable internet connectivity.

The first sub-theme concerned the experience of incompatible technological devices. A number of our study participants held opinions about the challenge of incompatible technical devices. The nursing students found that they had problems with their devices not being compatible with the online learning programs. They frequently had to lend their equipment to other family members. This statement was said by students who have economic limitations, where most students come from the lower-middle economic class. Their statements as follows:

"My cell phone is not sophisticated enough to store a lot of memory and applications, including learning materials."

"When I have to use various applications on my computer, together, it often slows down the learning process, while opening the material also using zoom.."

"....At the time I needed a more advanced computer, there was only one in my house, when I needed it, my younger brother also wanted to use it."

The second sub-themes which emerged concerned the access of the internet which is one of the greatest learning challenges during online learning. Most of the students had poor internet connectivity. The internet network in the village is not good at all. The students have to leave their house and find the area with good reception to support the learning process. Under this sub-theme, participants' expressed the following views:

"Once during a presentation, I had to find a place that had a good internet connection so that it would not interfere with my presentation process"

"Often when using the zoom, many times I bounce out, so the information I get from the lecturer is cut off. Or when the lecturer asks me a question, and suddenly the internet connection is lost..."

"The possibility of lecturers experiencing poor internet connections, classes are disrupted, we students wait for a while, and learning comes to a halt. Sometimes it happens that the lecturer does not return to the zoom, and continues with asynchronous learning."

Theme 2: Technology cost

The participants referred to the theme of technology cost as one of the challenges, some participants were faced with the expense of the online learning process. Purchase various supporting devices such as microphones, headsets, or more sophisticated cellphones to support the online learning process. Following assertions serve as evidence for this:

" I used my money to assist my parents in purchasing a more advanced phone so that I could readily enroll in online courses."

"My previous laptop was incompatible with some software, so I had to get a new one."

"To make it more convenient for me to engage in online learning, I bought electronic support tools to use zoom such as headsets, because my siblings and I are both studying online."

Nursing students reported that they received a monthly internet study quota package provided by the Indonesian Ministry of Education. However, before the month ended, the internet quota package had run out, and the assignments were still piling up, so I needed to buy an internet quota when the learning quota provided by the government ran out to support online learning. They expressed their views in the following statements:

"Sometimes the learning quota we get from the government is not enough, so I have to buy more quota to engage in online learning."

"Imagine that I spent two hours utilizing Zoom to follow one course's learning. There are days when my class schedule is full from 8am to 4pm. So there is a lack of quota that I get from the government."

Theme 3: Inexperience with ICT

The nursing students pointed out that online learning was a new experience, there were lots of applications and programs that they had never used previously. These are discussed under the following two sub-themes here: (1) students' new experiences and, (2) faculties' new experiences.
The first sub-theme, which can be regarded to the situation before the Covid-19 pandemic, learning was done using traditional methods, face-to-face meetings in the classroom.

Although the use of asynchronous methods, such as doing assignments using technology, the use of face-to-face synchronous is a new experience. Following are some of the ways that participants expressed their thoughts on these issues:

"When I started online learning, I felt shocked and confused to follow various processes, including online zoom, using moodle, google classroom, google meet, and submitting assignments that sometimes differed from one lecturer to another."

"Online learning is a new experience for me. In addition to the complicated use of technology, communication problems to discuss learning materials using technology such as WA, are sometimes less quick to respond."

"It is very different from the previous learning system. During online learning, students have to adapt to various new online learning platforms. This learning process is indeed a new thing for me."

The second sub-theme concerning new experiences in online learning includes also new experiences of faculties. The nursing students pointed out that some lecturers were inexperienced in using ICT. Students strongly feel that lecturers are also not ready to use technology in online learning. Participants' perspectives about the faculties' new experiences is quite discernible from the following statements:

"Lecturers appear to be less adept at utilizing different online learning resources. Sorry...especially old lecturers..heee."

"There are even lecturers who ask students how to use the google meet feature. Also once students had to teach lecturers how to change the availability submission and due date in moodle."

"Unfortunately, the older lecturers do not grasp how to employ advanced technology in learning, despite the fact that there are many new lecturers who do."

Theme 4: Inadequate learning process for clinical learning

Nursing students are also asked about their satisfaction in online learning, where nursing practices such as laboratories and clinical practices must be carried out online. Most of them admit that online learning does not optimally facilitate clinical learning and laboratory learning. The statements in favor of inadequate clinical and laboratories learning included the following:

"Clinical education shouldn't, in my opinion, be conducted online. The technological equipment used in learning does not provide opportunities for students to practice it correctly, such as to direct patients."

"Even though I followed him on Zoom, the practices carried out by the lecturers in the laboratory could not be observed directly. I can only practice as if I were a patient."

"While we can watch the various videos that have been supplied to us repeatedly, they cannot compare to the reality of a clinical setting."

Our research study examined undergraduate nursing students' perspectives regarding technological challenges in online learning during Covid-19 pandemic. The concept of online learning is a new learning system in Indonesia, since it was implemented suddenly in 2020. In relation to technological challenges in online learning in nursing education at the undergraduate level, no research was previously conducted in one of the private nursing schools in Bandung, Indonesia.

In our analysis, we have identified the technological challenges faced by nursing students in online learning in the form of technical issues. Incompatible devices experienced by nursing students hinder the learning process. Inadequate technology equipment and sharing equipment with family members can affect the effectiveness of online learning (Drane, Vernon and O'Shea, 2020; Blundell, 2020). The results of study in several developing countries, the issue of inequality in economic, social and mental in online-based education has occurred. Worrisomely, it is not improbable that the increased learning loss due to the pandemic will result in long-lasting inequality, widening the divide between racial and ethnic groupings in society (Cahyadi et al, 2022; Mathrani, Sarvesh and Umer, 2022; Haelermans et al, 2022). Therefore, it was recommended that collaborative teaching, which values the potential of students and future nurses as a way to address their vulnerabilities (Silva et al, 2021).

The second challenge under the technical challenges theme is internet connectivity. This problem is very common in online learning. The instability of the internet connection interferes with studying, doing assignments and even more so when taking tests and submitting assignments (Gultom and Tambunan, 2021; Ahmadi., Ilmiani, 2020). In some cases, due to a weak internet connection and the frequent logging out of students, online courses may be fully or partially inaccessible to students. Many students, especially those who reside in rural and underdeveloped locations, lack access to a sufficient and effective internet connection, which causes numerous issues with their academic performance (Zarai and Mohammadi, 2021; Tambunan and Tambunan, 2022). However, the decision-makers who draft a policy for online education need to understand how to assist e-pedagogy and deal with any crises in education that are beneficial for institutions of higher education (Shrestha et al, 2022).

According to our study participants, the internet quota that has been provided by the Indonesian government, namely the study quota program given monthly to students, is sometimes not enough until the month ends. Hence, students have to buy a quota to be able to engage online learning optimally. The study's findings are consistent with several studies in which the use of the internet as a tool for online learning is mentioned. The availability of internet quota provides flexibility for students in attending online classes. Wherever and whenever they need an internet connection, learning activities can take place (Pertiwi, Oktarina and Risdawati, 2021; Amalia and Purnamaningsih, 2022). It is highly favored that technology effectively supports online education, it must be dependable, approachable, and user-friendly, with tech support available around-the-clock every day (Willliamson and Muckle, 2018).

Inexperience in organizing online education is one of the challenges in this research result. This result is consistent with many research results where the conditions of the Covid-19 pandemic forced the implementation of online learning. Unpreparedness and inexperience in online learning are shown by both students and lecturers. The transition from traditional learning to online learning gives stress impact (Angelica and Tambunan, 2021; Vindegaard and Benros, 2020). However, individual factors greatly influence the way in which stress is responded to. Personality traits influence the way individuals perceive adaptation (Flores et al, 2022). Various affective, cognitive and behavioral reactions in dealing with changes from traditional learning to online learning. Students and lecturers are expected to use adaptive coping in dealing with online learning conditions in the Covid-19 pandemic era (Tambunan and Kristiana, 2022; Bozkurt, 2022).

Participants in this study reported that online clinical learning is not very effective. The majority of them acknowledge that online learning does not best support clinical and laboratory learning. The results of this study are inconsistent with several studies in developed countries. Various online clinical and laboratory learning strategies can be implemented such as interactive videos, online-based games, video discussions, interviews with a virtual patient (Borysiuk et al, 2022; Tambunan, and Simbolon, 2022). Furthermore, the various creations to facilitate online clinical and laboratory learning such as a combination of case studies, video clips, and guided questions are believed to build student confidence in honing clinical skills (New, Edwards and Norris, 2022). Nursing students' skills were significantly improved by the use of technology, although many online learning techniques for clinical and laboratory

learning are thought to produce lasting learning results in the form of mental representations (Min, Min and Kim, 2022).

4. CONCLUSION

This study concludes that technological challenges in online learning include technical issues, technological cost, inexperience in ICT and clinical learning issue. These challenges illustrate the existence of the several conditions including incompatible devices, unstable internet connectivity, need to buy adequate technology devices, purchase an additional internet study quota, is a new experience for both students and faculties, and lastly, inadequate clinical learning platform.

There are some limitations to this study. The findings of this study cannot be generalized because it was conducted in only one nursing school. Although four core themes and a number of sub-themes emerged from our study, the authors are aware that there must be other potential strengths and weaknesses of this modality for undergraduate nursing students. Secondly, to ensure the effectiveness of online learning for undergraduate nursing students, the challenges of online learning should be rigorously and regularly evaluated.

The findings of our research support the evidence regarding the technological challenges in online learning of nursing students, however, Online learning in nursing education is something that should continue to be developed. By reviewing the effectiveness of online learning, there is much for nursing education to address to reduce barriers to online learning. Thus, the online learning process will be more effective to achieve the learning objectives set by the nursing education curriculum. In addition, it is also necessary to consider continuing to use the online learning system even though the Covid-19 pandemic will end soon. This can be a consideration for the higher education system in Indonesia, especially nursing education, where technology in the nursing world will continue to develop. Nursing education plays a role in developing technologically equipped nursing students. In further, there is a need for research to identify student satisfaction in online clinical learning. By using various technology tools, clinical learning will be more effective to improve nursing students' skills.

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