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ORIGINAL RESEARCH

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MEDICAL STUDENTS' PERSPECTIVES ON E-LEARNING DURING THE COVID-19 PANDEMIC IN INDONESIA

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ABSTRACT

Background: Online learning, as one e-learning form, enables interactive learning experiences for students. However, undergraduate students in the medical programme of Cenderawasih University in Papua have been facing various challenges in their engagement with online learning activities during the Covid-19 pandemic. This study examined the perspectives of medical students about their online learning experiences during the university closure due to policy regarding the pandemic situation.

Methods: A total of 125 students participated in an online survey using Google Forms, and the data extracted were subject to descriptive analysis

Results: The results showed that despite some positive feedback about the online learning management, learning delivery, and motivation received, the students shared their online learning challenges in their interactions with lecturers and peers, their inability to undertake independent self-study, as well as their challenges in group discussions and practicum classes. Other challenges students experienced were difficulties in purchasing internet data and their limited access to learning resources and learning spaces.

Conclusion: Taking the socioeconomic and cultural status and contexts of Papua, the most eastern province of Indonesia, this study contributes to the literature on e-learning in medical education in such contexts. Medical faculties in similar settings can also benefit from this study.

Keywords: online learning, medical education, Covid-19 pandemic, Papua Medical School

PRACTICE POINTS

- A supportive learning environment with adequate infrastructure increases students' learning satisfaction with e-learning.
- E-learning needs to be equipped with adequate online references.
- Adequate support for students' education and non-educational aspects of students' lives enhances students' learning experiences.

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INTRODUCTION

The novel coronavirus (SARS-CoV-2, COVID-19) and its repercussions have presented significant challenges for education around the world. It has forced fast-moving transitions from conventional to online learning methods. Despite its contribution to an increase in students' access to education as well as ensuring uninterrupted teaching activities,1 lack of infrastructure to support online learning, high cost, human unreadiness, and limited evaluation approaches have hindered students' effective learning experiences.[2-4] For regions where infrastructure to support teaching and learning activities remain problematic, online learning has various challenges.[5-7] Whilst online learning is, theoretically and practically, not new in medical education, in the context of the undergraduate program in Papua Medical School, Cenderawasih University, it is still new and possesses some inevitable challenges. This study aims to examine the perspectives of undergraduate medical students about their online learning activities at Papua Medical School during the university closure to slow transmission during the Covid-19 pandemic. Taking place in Jayapura, the capital city of Papua, the most eastern province of Indonesia, its socioeconomic and cultural issues corresponded to the Covid-19 pandemic in the region, which was different from other regions in Indonesia and directly affected the implications of this study. Besides its theoretical contribution to the e-learning literature in medical education, particularly during times of crisis, this study supports the institution to evaluate their online teaching and learning activities in order to improve the quality of education.

Indonesia government's policy on COVID-19 and its impact on Papua

The spread of Covid-19 in Indonesia cannot be separated from crisis management and its inadequate mitigation.[8] Indonesia announced its first case of Covid-19 on 2 March 20209 when the world had already made various actions to anticipate the risks of the virus, as well as imposing tough travel restrictions following China's declaration of the presence of Covid-19 in Wuhan at the end of 2019, then the World Health Organization's further declaration of it as a pandemic at the beginning of 2020. The widespread of the virus required Indonesia's quick and appropriate attention and actions, not only in the health sector, but also in other important sectors, such as labor, the environment, tourism, government, and socioeconomics.[8] Several policies were made, including several legal products for Covid-19 handling; namely, four Presidential Decrees, two Presidential Regulations, one Government Regulation, one Presidential Instruction, and one Government Regulation in lieu of a Law. They include physical social distancing,[9] regional PSBB (partial lockdown),[10] and Social Safety Net programs to protect the community,[11] such as the Family Hope Program, Staple Food Cards, Pre-employment Cards, electricity subsidies, additional markets and logistical operations, credit payment relief for informal workers, and the Village Fund Direct Cash Assistance.[8]

The Government's policies have, in turn, affected regional policies, such as in the Province of Papua. With its 5,440 tests per one million population, far different from the 26,527 tests in Jakarta,[12] similar to most of Indonesia's regions, Covid-19 handling in Papua was limited due to the inadequate health facilities and the limited number of health workers.[13] This discrepancy occurred particularly in regions with extremely difficult geographical locations.[12] The number of people receiving the Covid-19 vaccine in the whole region has also been confirmed to have the lowest level of vaccination, with only 593,606[14] from a total population of 4.36 million population.[15] The effort to control the transmission of Covid-19 in Papua also includes school closures, one of which is Cenderawasih University which instructed all faculties to quit on-site activities and adopt online learning instead. Although the transition process triggered students' protest as they experienced hardship to learn online, the university had no other choice than to keep the education process running by utilizing online learning methods.

The COVID-19 pandemic policy that instructed the school closure to prevent virus transmission has caused a rapid change in learning methods of medical education. The rationale of this study is its significance of capturing the experience of the medical students due to the change of conventional to online learning methods during the pandemic and its lessons learned that could be taken by education institutions to improve the learning experiences of medical students. Therefore, this study examines the perspectives of medical students about their online learning experiences during the university closure due to policy regarding the pandemic situation.

METHODS

Design of study

This is an online survey-based study of all undergraduate medical students at the Papua Medical School, Cenderawasih University, Jayapura, the capital city of Papua Province.

Population and sample

This study employs a saturation sampling method by including all members of the population as part of the research sample. An online survey was sent to a total of 217 active undergraduate medical students enrolled in an even semester in 2020. Out of 217 students, only 125 students responded to the survey.

Data collection and procedure

An online survey was conducted from 1 – 31 July 2020 to collect the information, at the time the school was locked down. The Likert-scale questionnaire was designed using Google Forms that consist of 29 questions divided into five sections, namely faculty management of online learning, students' perspectives of online learning and interactions during online classes, group discussions and tutorials, students' perspectives of learning materials and environment, and practical sessions in biomedicine and basic clinical skills laboratories. Five choices of answers were given with a value of 1 equal to strongly disagree, 2 to disagree, 3 to be neutral, 4 to agree and 5 to strongly agree.

A total of three enumerators were assigned to help distribute the Google Form links by WhatsApp to all students and to monitor the progress of students when filling in the questionnaire. They also assisted students with any technical issues during the time the survey was being completed. Students spread anywhere from their homes or dormitories in different regions, their own regions in Papua and West Papua provinces completed the online survey as long as they had internet access.

Data analysis

The data collected from the survey were then tabulated, grouped, and presented using Microsoft Excel, then underwent descriptive analysis. Descriptive statistics were also carried out to understand the distribution of study participants. Both analysis work and writing of the paper took place in Jayapura from 1 August to 31 December 2020. The results were presented in charts and diagrams and divided into five categories, given in the result and discussion below.

Ethical clearance

A complete ethics form with a research proposal and questionnaire were sent to the Ethics Committee, Papua Medical School on 1 June 2020. The authors obtained its ethics approved on 14 June 2020. No further issues were found during the ethical review.

RESULTS AND DISCUSSION

Participant characteristics

Table 1 describes the characteristics of the students participating in the survey.

Those participating in the survey comprised 41.6% of students from the second and fourth semesters, 16.8% from the sixth semester, and no students from the eighth semester. Since then, the faculty has implemented a new curriculum throughout 2017-2022, so no students were enrolled for that semester.

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Table 1. Characteristics of the Student Participants

	Students	Percentages
Level		
Semester 2	52	41.60%
Semester 4	52	41.60%
Semester 6	21	16.80%
Semester 8	0	0
Gender		
Male	59	47.20%
Female	66	52.80%
Ethnicities		
Papuan	61	48.80%
Non-Papuan	64	51.20%
Housing		
Living with parents	125	100%
Living in dormitories	0	0
Financial contribution from parents		
< IDR 100,000	0	0
IDR 100,000 – 500,000	0	0
IDR 500,000 – 1,000,000	83	66.40%
IDR 1,000,000 – 2,000,000	30	24%
> IDR 2,000,000	12	9.60%
Monthly expenditure for data credit		
< IDR 100,000	40	32%
IDR 100,000 – 500,000	85	68%
IDR 500,000 – 1,000,000	0	0%
IDR 1,000,000 – 2,000,000	0	0
> IDR 2,000,000	0	0

Out of 125 participants, 47.2% are male and 52.8% female. Students, based on their ethnicity, comprised 48.8% of Papuan and 51.2% non-Papuan. All students who participated in the survey (100%) lived with their parents. while 66.4% of students received monthly financial contributions in Indonesian Rupiahs (IDR) 500,000-1,000,000 (around US$ 35-70), 24% of students received IDR 1,000,000-2,000,000 ($70-135) and 9.6% received more than IDR 2,000,000 ($135). Upon receiving financial contributions from their parents, 68% of students spent IDR 100,000-500,000 ($7-35) on their monthly communication and data credits expenses, and only 32% spent less than IDR 100,000 ($7).

Medical students' perspectives on the management of online learning

Management of online learning presents students' perspectives on the use of online learning designed by the faculty, how it is socialized, and how students familiarize themselves with the application. The integrated academic system, SIAKAD, is used for students to enroll in their courses, monitor their weekly attendance, and access grades for each course each semester. Lecturers use Sistem Integrasi Akademik dan Administrasi – SIAKAD (translated into English as the Academic and Administrative Integration System) to verify students' enrolled courses, add students' attendance and grading. One coordinator and the Google Classroom or Zoom host are assigned to support all learning activities. Based on the schedules, the coordinator communicates with both lecturers and students informing them of all learning activities while each host supports the online lectures. The host could also assist the lecturers to mark students' attendance and report directly to lecturers and the study program director. WhatsApp is used to inform the students of their schedules, share learning materials, and as a medium to share general information related to the course and answer inquiries from both lecturers and students. Figure 1 shows students' perspectives on the management of online learning.

The results showed that most students agreed that the faculty provided clear guidance on the application for their e-learning. When asked about how familiar they were with operating online learning applications, most students agreed that they were familiar with the use of online applications for their e-learning activities and around 25% of students found it challenging to use the online application provided by the faculty.

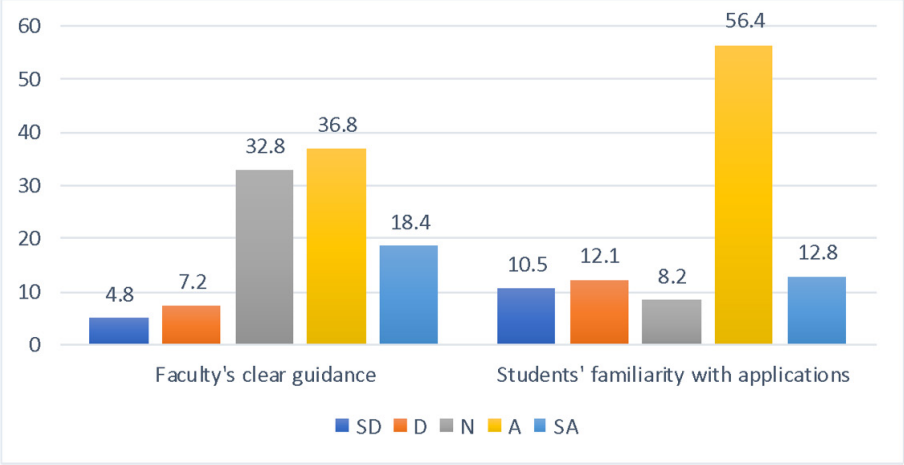

Figure 1. Students' Perspectives on the Management of Online Learning

Medical students' perspective on online learning and interactions

Students' perspectives on online learning are presented in Figure 2. This shows students' overall experience of online learning, described through the delivery of online learning, lecturers' motivation, interactions with lecturers and students, students' adaptation to independent self-study, including time management, and challenges faced during the Covid-19 pandemic.

The delivery of online learning explained how well lecturers deliver their weekly online lectures and tutorials. Most students agreed that the delivery of online materials by lecturers went well. However, compared to online learning, most students (87%) chose offline learning. The results also showed that medical students (74.2%) agreed that the lecturers constantly motivated them during their online study. During the university closure, besides learning challenges, medical students also

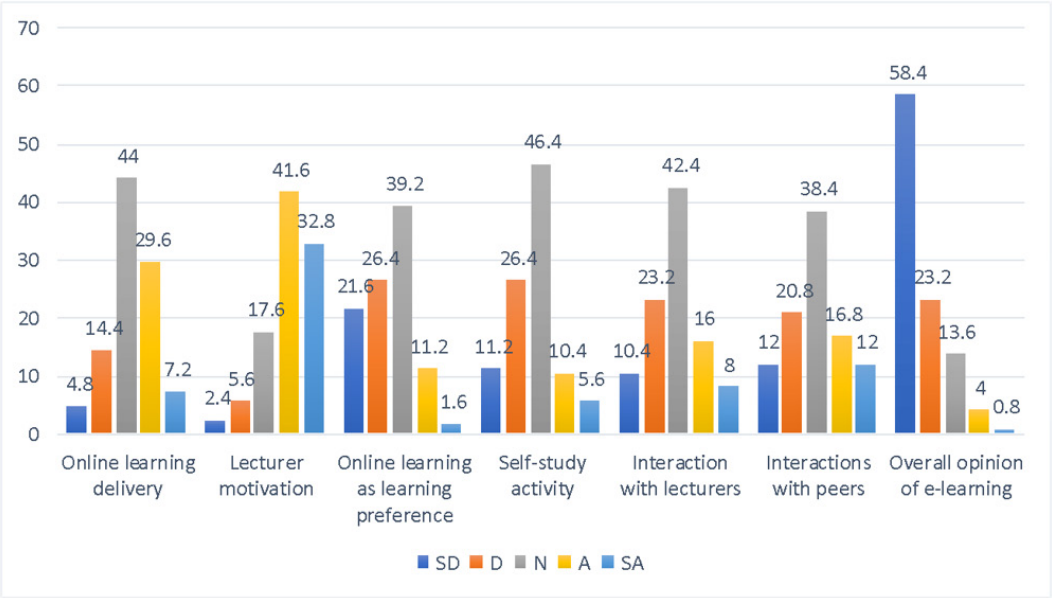

Figure 2. Students' Perspectives of/about Online Learning and Their Online Interactions

encountered various health and economic issues, and lecturers were made aware of the importance of emotional support for indigenous students.Despite the counseling unit being assigned to provide social and emotional support to students in Papua Medical School, in the social context of Papua, lecturers were also seen as parents who not only provided education but also attention and care to their students.

Online learning requires students to undertake independent self-study. Independent self-study in the context of this study explains how much time the students' spent revising courses themselves at home following their lectures and tutorials. The result showed that most students disagreed that they undertook independent self-study. This indicated that students did not perform self-study during and after their online-learning activities had taken place. Students were then asked about the time per day they allocated to do independent self-study following their online classes. Most students (54.4%) only spent 1-2 hours per day and some even spent less than one hour per day. When asked further about the reason for this, most students responded that they have 'had enough' with online materials by then. Students (39.2%) said that online learning did not motivate them to do further studies, 13.6% responded that the contents were uninteresting, and 24% of students did not have enough stamina to study after the online classes had finished.

Interactions among students and between students and lecturers are another variable assessed during e-learning activities. Specifically, students were asked whether they felt free to ask questions or talk to lecturers during the online classes. The results showed that most students agreed that they did not feel free to ask questions during class. When asked about their interactions with their peers. These results were similar to those of their interactions with lecturers in that most students strongly disagreed that they interacted with their peers. This meant that students experienced limited freedom to express themselves during online learning both with their lecturers and/or their peers.

Medical students' perspectives on the learning materials and the environment

Students then shared their challenges during online learning activities. The questions about learning challenges clarified the medical students' experiences with learning and the socioeconomic challenges encountered during their online learning. The results show that most students had financial difficulties in purchasing internet data credits. Table 1 describes students' monthly expenditure on communication and data credits where 32% of students spent less than IDR 100,000 (US$ 7) to purchase around 5-7 GB of internet data credits and 68% of students spent IDR 100,000-500,000 ($7-35) to receive around 20-30 GB of data credits. With full teaching and learning activities during the week, in addition to weekly tutorials, group discussions, practicums, and independent self-study outside students' online social networking during the university closure, medical students still found it challenging to carry on their studies due to their increasing need for internet data credits.

Most students experienced difficulties in accessing learning resources, such as the library, printed books, and e-books. The fact that the Papua Medical School did not have any online resources during the lockdown, students were forced to find literature online to support them with online learning, tutorials, practicums, and independent self-study. However, this also needed sizable internet data credits that sometimes needed students' own financial resources to purchase journal articles and e-books. While limited printed medical books were accessible to students in the faculty, with the provincial government's physical and social distancing rules during the lockdown in the whole region, students were not allowed to access them during the university closure.

Furthermore, 14.4% of students did not have any comfortable spaces to carry out their online learning from home, 12.8% of students felt that they do not receive any psychological support during this kind of learning environment, and 3.2% of students do

not have a personal computer. As shown in Table 1, although 100% of students were living with their parents; they had no comfortable spaces to study – particularly those living in an environment with noisy neighbors. As well as having no personal computers, some students found it challenging to perform their online learning. Students frequently engaged in their online studies using their mobile phones, which often created challenges when accessing learning materials during lectures. Fewer than 1% of students consistently expressed other challenges, such as bad internet connections, difficulties with learning new applications, experiencing too many distractions, and issues in online learning management, including uninteresting learning materials, changes in learning schedules, and the lectures not finishing the whole topic. These challenges have then affected students when engaging in online learning activities.

Medical students' perspectives on group discussions

Figure 3 presents the perspectives of the medical students about how their online discussions were designed. Medical students were formed into small groups to discuss certain topics related to biomedical content. One topic, for example, was usually discussed over three different meeting sessions of one hour each, where the discussion was moderated and guided by one tutor in each group. Students were given a list of questions to construct a discussion around in order to answer the learning objectives of the topic. Students were also given opportunities to construct their own learning objectives about the topics being discussed.

The results showed that most students agreed that they were facilitated well by their tutors during online discussions. Students further expressed their interactions with their tutors that most students held a neutral position, and 29.6% disagreed. This meant that most students hesitated to have interactive discussions with their facilitators. When asked about their interactions with their peers, most students show not much interaction. Both these results showed that students did not have much online interaction. However, when comparing the two interactions, student-student communications were more interactive than student-tutor communications. When asked about their overall experiences of online discussions, most students gave negative responses. Nevertheless, more than 50% of students acknowledged that the delivery of the online discussions was managed well by the faculty.

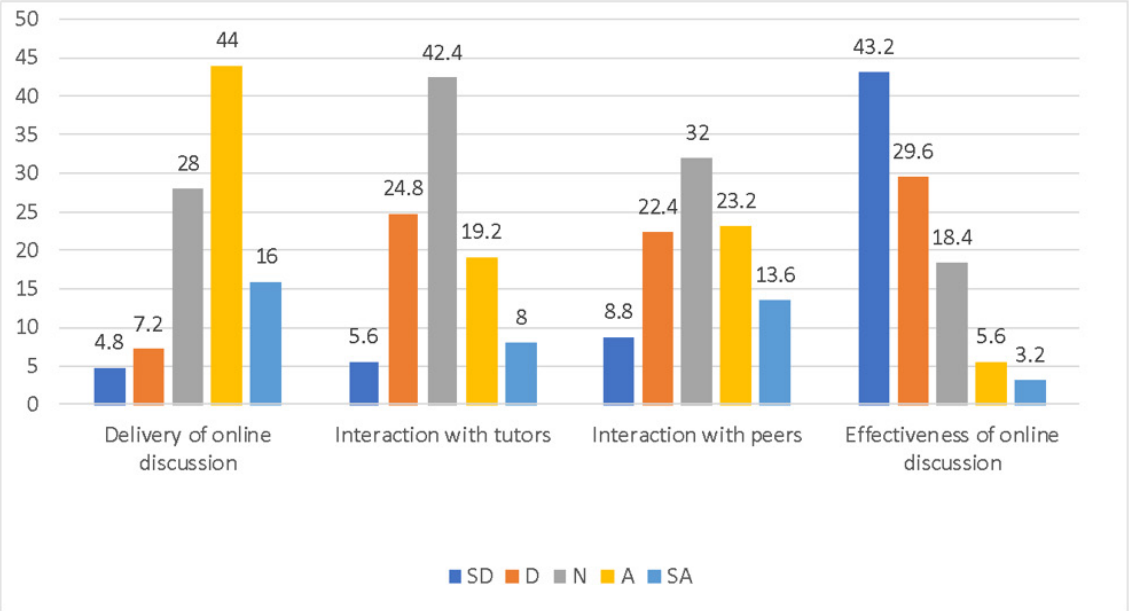

Figure 3. Students' Perspectives On Online Discussions And Tutorials

Medical students' perspectives on the practicum classes

This section explores students' experiences in the practicum classes in biomedicine and basic clinical skills laboratories within all semester levels. These two courses were chosen since the first author acted as both lecturer and tutor for them. Asking students' perspectives on these two online practicum classes would then provide valuable input into this paper and an evaluation of the author as both lecturer and tutor of these classes.

When questioned about whether students enjoyed participating in the biomedicine practicum through online learning, most students disagreed. This indicated that students do not engage during their online biomedicine practicums. More than 60% of students were also concerned with the quality of practicum materials while almost 80% of students found them hard to understand. More than 75% of students also expressed that they preferred offline biomedicine practicums to online ones. Figure 4 shows students' experiences in participating in the biomedicine practicums.

In contrast, students showed quite a positive response to the basic clinical skills practicum. Students (29.6%) responded equally in a neutral position and agreed that they could follow the practicums without any problems. Most students could also access the online basic clinical skills teaching without any issue. When asked whether students could comprehend and understand the steps of the skills taught to them, 41.6% of students were neutral in their responses, 22.4% disagreed, and 18.4% agreed. Figure 5 shows students' perspectives on learning during the online basic clinical skills practicum.

Students were also asked whether they could continue to self-practice the basic clinical skills materials with their family members or friends at home. 46.4% of students disagreed. This indicated that although most of the students enjoyed this online practicum, they preferred to do it offline. The students were also asked about their interactions with their instructors. The results showed a trend from a neutral position to agreement compared to disagreement. Overall, students expressed more of a neutral disagreement to see online skills training compared to offline skills training.

The overall findings indicated that students had new learning experiences during the Covid-19 pandemic. Despite the challenges, students provided relatively positive responses to how online learning

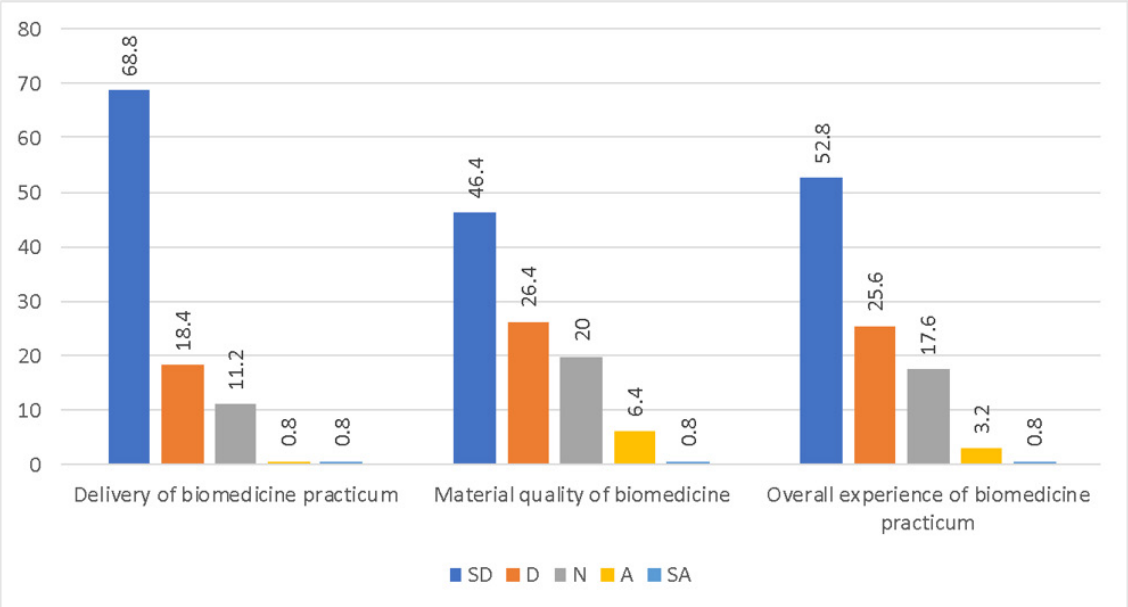

Figure 4. Students' perspectives on learning biomedicine practicums

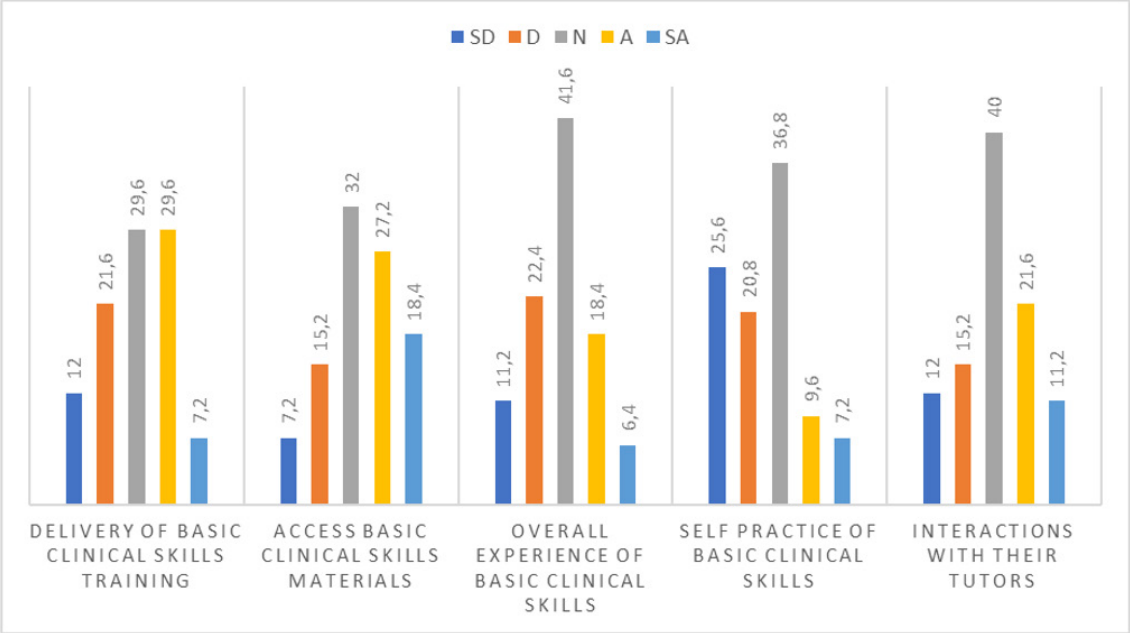

Figure 5. Students' perspectives about learning through basic clinical skills practicum

activities were managed by the faculty and how lecturers delivered online teaching. Strielkowski[16] acknowledged the massive changes experienced in higher education induced by the presence of Covid-19. Innovations that take several years to produce were introduced promptly to meet the student's educational needs.[17] Similar to this study, Singh et al.[18] found that online classrooms used to continue medical education have received encouraging feedback from students. However, their feedback revealed some interesting paradoxes as almost 50% of students still preferred physical classrooms compared to e-classrooms.[19] This was also consistent in this study as, despite medical students doing their best to engage with various e-learning offered by the faculty, they still preferred offline learning.

Students were also more motivated when the teachers contacted them personally.[20] This resonates with the findings of this study that medical students enjoyed the emotional support from their lecturers during online learning. In the cultural context of this study, lecturers were considered by most Papuans as parents, so provided emotional care, comfort, and support in these unprecedented times of uncertainty amid the Covid-19 pandemic.[21] Gonzalez et al.[5] also had similar findings to this study in that some students have positive responses to online learning when receiving support from their lecturers. Although set in a different context from this study, their Covid-19 confinement also had positive impacts on students' performance.[5]

However, the students' negative responses in this study outweighed the positive ones. Students expressed challenges in engaging with online lectures, discussions and practicums. Online learning has restricted them from interacting both with their lecturers and their friends. Hall et al.[22] argued that in clinical and academic environments, students required adequate attention given to their learning. Utama et al.[23] agreed that engaging with coaches or academic advisors in online classrooms can help students to detect problems in their current learning environment in order to find solutions. The main objective of this coaching relationship was to enable students to share their path towards growth and development by ongoing reflection and embracing failures as a learning process. The

findings also indicated how online learning has restricted students' freedom to interact with their lecturers and their peers. Ruiz et al.[19] emphasized the importance of how students were satisfied with their e-learning as a part of measuring the effectiveness of e-learning. In this study, students' learning challenges from the limited interactions with their lecturers and friends, as a part of their social support during the university closure, have distracted them from engaging in online learning.

As a result, most students were challenged further by the need to undertake independent study following their online classes. The findings of this study indicated that students have 'had enough' of online learning and that the online materials did not stimulate them to do further studies together with the uninteresting contents of some online materials. Ruiz et al.[19] argued that online learning should have enabled interactive learning where students were required to be active in their self-study. This should facilitate more efficient learning as students can gain knowledge, skills, and improved attitudes quicker than through offline learning, which also improved students' motivation and performance.[22] While online learning should also offer a stronger learning stimulus,[3] in this study students lacked the interest to undertake individual study.

Students were also further challenged by other factors, such as financial difficulties in purchasing internet data credits, limited access to learning resources, and the fact that students did not have supportive learning environments. Countries should ensure there is a fine balance between protecting public health while also preventing further economic and social disruption and respecting human rights in times of crisis.[17] Indonesia's policies on education during the Covid-19 pandemic, such as single tuition fees and student assistance funds were not enough to alleviate the burden of the learning problems experienced by Papuans. Papua, as a region receiving the benefits, was still challenged by the increasing cases of Covid-19 with rising daily casualties,[12] the lack of infrastructure to support online learning,[24] and socioeconomic issues.[21]

During this rapidly evolving crisis, both students and educators should exercise greater flexibility and understanding of the potential consequences of the pandemic[25]. However, basic issues to support online learning, such as internet connectivity issues have still been the largest hindrance to online education in Papua.[24] The findings resonate with Kapasia et al.[20] who found that students undertaking online learning have been facing various problems that include unfavorable study environments and poor internet connectivity.[25] The work of Dorn et al.[26] further confirmed the findings that learning losses were mostly experienced by low-income students who were less likely to have access to a high-quality online learning environment, such as quiet study spaces with minimal distractions, a lack of technology devices and poor internet connections. This showed the unreadiness of the infrastructure and technologies used to support education,[27] which undermine the principles of effective online learning.[7]

Given the findings of this study, the strengths of this study are that it provides us with a greater understanding of students' learning challenges of online learning and the importance of students receiving the support they need for their online learning in times of crisis. A quantitative approach through an online survey has enabled students' perspectives captured when the Covid-19 pandemic had prevented face-to-face interactions. Students' perspectives on online learning in such a context provide an important contribution to the literature on online learning. There is a limitation of the study. Whilst direct observations were conducted from time to time during the research, more dynamic students' perspectives on online learning through in-depth interviews can provide richer findings and contributions to the area of study.

CONCLUSIONS

Overall, the study concluded that medical students have had learning challenges in engaging with online learning. Although the management of online learning was considered well-managed by the faculty, and the delivery of online learning went quite well, students expressed several challenges that should be discussed and solutions sought by institutions. Medical students experienced difficulties in interacting with their lecturers and

peers during online classes, discussions and tutorials, and practicums. Students also had difficulties with undertaking independent self-studies following their online classes, discussions, and practicums, due to a number of factors related to the timing and contents of their online materials. Further issues included financial difficulties, students' difficult access to learning resources, and unfortunate learning environments.

RECOMMENDATIONS

This study provided several recommendations that other medical faculties with similar contexts can learn and benefit from. First, to be effective for student engagement, the design of online learning needs to encourage more interactions among students and between students and lecturers. Second, faculty needs to enable online and offline (while still obeying the physical distancing policy) library to ease students access learning references. Third, in similar cultural contexts, lecturers should provide emotional support to students with their e-learning while facing economic hardships and a non-supportive learning environment during the Covid-19 pandemic. Adequate support for students' educational and non-educational aspects of their lives can enhance students' e-learning experiences which, in turn, will influence their academic performance.

COMPETING INTEREST

The authors declare that there are no competing interests related to the study.

AUTHORS' CONTRIBUTION

Renny Sulelino – designed the study, prepared the questionnaire, analysed the data, wrote the paper

Hendrikus Masang Ban Bolly – supported the first author to analyze the data, and wrote and revised the paper.

Jhon Urasti Blesia – supported the first author in revising the paper.

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