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The Impact of the Covid-19 Pandemic on Undergraduate Medical Education in Namibia: The Educators' Perspective

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Abstract:
Introduction: The advent of the COVID-19 pandemic caused major disruption on a global scale, affecting medical education in Namibia as well. This necessitated the swift transition to online learning from traditional face-to-face learning. This study focused on the experiences of undergraduate medical educators, exploring the challenges, opportunities and innovations presented by the pandemic. It aimed to bridge the gap in research in Namibia and educate on improved preparedness for future disruptions.
Methodology: This was a qualitative study that applied purposive sampling to select 20 undergraduate medical educators who met the inclusion criteria, from the University of Namibia – School of Medicine. Data collection was done using an online questionnaire and then thematically analyzed.
Results: Undergraduate medical educators faced challenges with their IT capabilities, technical issues with online learning, reduced student engagement and lack of institutional support. Significant innovations such as flexible deadlines and increased use of blended/ hybrid models were prominent. Long-term impacts were enhanced IT skills and advocacy for permanent adoption of online learning and hybrid models.
Conclusion: The pandemic significantly disrupted undergraduate medical education in Namibia. Even though it was a challenging period, opportunities were presented with the prominence of hybrid/blended learning methods. The lessons learnt are important for future preparedness.

Key Words:
COVID-19 Pandemic, Undergraduate Medical Education, Educators' Perspective

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Introduction

Orientation of the study

On December 31st 2019, the World Health Organization (WHO) reported the first case of Corona Virus Disease of 2019 (COVID-19) from Wuhan, China.[1] This highly transmissible airborne virus that is caused by SARS-Cov-2, spread rapidly causing WHO to declare it a global health emergency by January 31st 2020. On March 11th 2020, it was declared a pandemic.[2] By October 2021, the pandemic was responsible for over 239 million infections and 4.9 million deaths globally.

Governments worldwide responded swiftly by enforcing quarantine measures, improving healthcare facilities and services, and supporting social security programs to curb the spread of the pandemic and minimize its impact. The attention of researchers was diverted towards understanding COVID-19, its socio-economic and health impact, and formulating containment strategies.[3]

To minimize its spread, public gatherings were prohibited, resulting in the closure of educational institutions worldwide, including in Namibia.[4] This forced institutions of higher learning to shift to online learning, including medical schools. Medical education that was traditionally taught face-to-face transitioned to various online teaching and learning methods, posing significant challenges for medical educators and students.[5,6] Medical educators encountered obstacles related to their information and technology (IT) skills, adaptation of educational materials to online modalities and a toll on their mental health, among other things.[5-9] Students had to deal with limited access to electronic learning (E-learning) due to numerous factors such as mobile network accessibility, device ownership, electricity availability and financial constraints.[10,11,7,12,13]

Although there have been studies conducted on the the impact of COVID-19 on medical education, most studies are from developed countries, a few focused-on Africa and none were specifically conducted to assess the impact of the COVID-19 pandemic on undergraduate medical education in Namibia.[5,14] This study sought to shed light on the impact of the COVID-19 pandemic on

undergraduate medical education in Namibia, from the medical educators' perspective.

Problem statement

On a global scale, studies have explored the impact of COVID-19 on traditional medical education,[5,6,9] and a study focused on its impact on both pharmacy and medical education across Africa.[14] However, not much research has been conducted to assess the specific challenges encountered and opportunities presented by the pandemic to undergraduate medical education in Namibia from the medical educators' perspective.

Significance of the study

This study provided insight on the challenges faced by medical educators in the use of online platforms to teach and assess students. It informed on the adaptability and resilience of medical educators, highlighted the need for innovative teaching methods and offered guidance on the importance of technology in undergraduate medical education. The findings may be useful in informing policy makers and the development of new curricula that are better prepared to withstand future disruptions of similar magnitude.

Aim of the study

The main aim of this study was to assess the impact of the COVID-19 pandemic on undergraduate medical education in Namibia, as perceived by medical educators.

Objectives of the study

In the light of the above-mentioned problem statement, this study aimed to achieve the following objectives by collecting qualitative data from medical educators using an online survey to:

1. Identify the challenges and opportunities faced by medical educators in teaching and assessing undergraduate medical students during the pandemic.
2. Explore the innovative approaches adopted by medical educators to address the teaching and assessment challenges posed by the COVID-19 pandemic.
3. Assess the professional development initiatives undertaken and resources offered to medical educators during the pandemic to meet the demands on their careers as posed by the COVID-19 pandemic.

Literature review

Various studies have reported how the pandemic caused a globally significant disturbance to education, particularly medical education.

Studies, such as the one conducted by Rahman et al. (2024) have indicated that its impact has been more profound in low- and middle-income countries under which Namibia is classified. Traditionally, medicine has been taught face-to-face by interaction between educators and students; however, with the disruption caused by the pandemic, alternatives on how to impart education became necessary[5,8] reported that Namibia took strict measures to curb the spread of the virus, which necessitated the closure of schools and institutions of higher learning. The National Emergency Response to Education Committee of Namibia required both schools and institutions of higher learning to resort to e-learning as a medium of teaching to ensure the continuation of education during the pandemic. However, Bozkurt et al. stated that the Namibian government was inadequately prepared, ill-equipped, and consequently unable to respond effectively to the global crisis in terms of continued education.[15]

The adaptation to e-learning was not unique to Namibia as countries all over the world also adopted the same approach to ensure the continuation of education. Hays et al. took into account multiple research articles from countries such as the United Kingdom (UK), the United States of America (USA), Germany, Canada, Singapore, Egypt and India, whereby researchers from these countries and more, submitted articles to their journal concerning medical education and COVID-19.5 They pointed towards the urgent need to seek alternative ways to continue teaching medicine as a result of the closure of medical schools within their countries. They noted that the majority of these universities recognized the need to re-evaluate the delivery of medical education during the pandemic, noting that faculty responded promptly to the call by introducing a blended teaching method, which included the use of e-learning and teaching and face-to-face classes where possible. Technological alternatives such as simulations and virtual reality were explored in the countries that had the resources for these innovations. Universities were also required to modify their assessment methods while ensuring that the standard was not compromised. They further highlighted that this abrupt change from face-to-face teaching to online teaching placed a heavy burden on the educators as they adopted the curriculum for online purposes was found to be challenging. According to Adefuye et al., modifications to assessment methods were made, such as allowing for open-book examinations by many medical schools in the UK, as well as online examinations for final year students, which were done at Imperial College London.6 The USA allowed for online pre-clerkship curriculum at their medical schools, countries across Asia resorted to simulations and virtual learning platforms, while medical faculties in Europe adopted distance online education.

The study conducted by Adefuye *et al.* aimed to highlight the benefits and challenges presented to medical education in Sub-Saharan Africa by the pandemic.[6] Chief among their findings was that not much research was conducted in Africa to highlight the impact of the pandemic for medical education on the continent. They demonstrated that although the circumstances seemed unfavorable and harsh, the pandemic offered the opportunity to improve and enhance the way medical education was being taught.6 The shift to online education resulted in African governments making substantial investments into e-learning and technology-based pedagogy.6 Educators seemed to lean towards integrating social media platforms such as WhatsApp into their teaching, which was observed to increase their efficiency and effectiveness. However, the pandemic also challenged the medical educators' IT skills as they found that online teaching required them to be computer literate and be familiar with the applications used for online teaching. Educators faced significant challenges on how to develop and adopting teaching content to online teaching platforms.

Assessment of medical students was another issue as it was found that the multiple assessment methods which were developed for medical students were relatively deficient across the African continent at the time. They came to a consensus that the technological, educational, and healthcare infrastructures were severely impoverished. Their substandard condition caused considerable strain on the continent's resources, exacerbating the educational crisis, among other things, brought on by the pandemic.[6] They concluded by stating that the COVID-19 pandemic had underscored the need for adaptive and forward-thinking strategies to ensure quality medical education in Africa, including but not limited to providing adequate funding for medical education and research; and leveraging technology to expand e-learning and telehealth services.

A study conducted by Rahman et al. echoed findings similar to other researchers, highlighting that the field of medical education in Bangladesh faced a significant challenge to adapt and integrate technology into their teaching methods while trying to maintain the quality of education. The primary challenge was that the pandemic stressed the already poor state of their technological infrastructure. They highlighted a domino effect, stating that the quality of medical education and evaluation would affect the caliber of medical graduates, which would ultimately affect the ability of health systems to maintain the health of their people in the future. Lucey and Johnston agreed with this finding by saying that the pandemic required medical institutions to ensure that the medical force produced would be suited to the needs of the people at the time.[16] Apart from the lack of IT skills of educators, their research highlighted that the teachers in Bangladesh faced challenges with maintaining and engaging students online; difficulty with getting feedback from students when they employed technology-based teaching methods; and a decline in their mental health and increased levels of stress.[9] They also reported that educators took into consideration the numerous obstacles the students had to overcome, which had an impact on the educators' perspective and reception of online teaching, such as increased financial needs, uncertainty of their education and a myriad of concerns within their personal lives. Adefuye co-authors came to the same conclusion with their research as they indicated that students' inability to afford technology-based learning, the increased difficulty with scheduling face-to-face assessment, and fear of contracting the virus, made online-teaching even more difficult for the educators.[6]

At the onset of the pandemic in Africa, several key challenges emerged. Etando et al. conducted a study across multiple African countries, including Namibia, to assess the challenges and innovations in medical and pharmacy education.[14] They found that during the COVID-19 pandemic, medical and pharmacy education faced significant challenges which necessitated the swift adaptation by the African universities of online classes and practical sessions for healthcare students, often in small groups. Even though delivering both didactic and practical learning remotely posed difficulties; the significance of practical skills training for physicians and pharmacists remained vital to their education. Carrying out that mandate highlighted the urgent need to enhance staff IT skills for transitioning courses to online platforms. Additionally, the scarcity of suitable technology equipment among students, concerns about internet costs and availability, and the practical difficulties of conducting hands-on sessions while maintaining the educational standard and adhering to COVID-19 restrictions posed further challenges. Their key findings for Namibian health science institutions were various responses directed towards the challenges presented by the pandemic. They stated that UNAM via its Centre for Online, Distance and e-Learning (CODeL) made provisions for educators and students to engage in online learning, teaching, and assessments.

The university allowed for a flexible working environment by integrating the use of different teaching methods and online platforms, and by providing some electronic books without any

additional charges for the students. They however did not specify what modifications were made to medical education in terms of teaching and assessments, neither did they explain how the modifications allowed by UNAM at large were integrated into UNAM SoM; the specific challenges posed by the pandemic particularly for Namibian undergraduate medical education and how they were overcome; nor the specific advantages of the pandemic for undergraduate medical education in Namibia. They did, however, come to a consensus that there is a need for health science institutions to migrate to education appropriate for the 4th Industrial Revolution, which stipulates that education should be learner-centered, work-integrated, competence-based and embrace digital education through a range of technologies.

Although studies, as mentioned above, have shown an opportunity for the advancement of medical education, Stoehr et al found that medical education was quite behind in terms of its progression to match the current capabilities of online education and suggested a hybrid approach combining both online and face-to-face teaching.[17] This study, from the educators' perspective, focused on shedding light on the positive and negative impact on undergraduate medical education in Namibia due to the COVID-19 pandemic, how the challenges discussed above were addressed, and how technology has thus far been integrated into medical education.

Methodology

Research design and setting

The research was conducted at the only School of Medicine (SoM) in Namibia located at UNAM Hage Geingob Campus. Although there are various schools within the faculty of Health Sciences and Veterinary Medicine at the campus, the researcher focused solely on departments from the SoM. This was a retrospective study that employed a qualitative approach.

Study population

The target population of this research were individuals with specific attributes, particularly those who were faculty members employed by SoM before, during and after the pandemic, comprising of pre-clinical and clinical undergraduate medical educators.

Sample and sampling method

For this study, the researcher used a non-probability sampling technique, which eliminated the need to calculate the likelihood of selecting individuals from the population as a sample.[18] More specifically, the researcher used purposive sampling which was guided by two main factors: the objectives of the study and the researcher's familiarity with the population and research topic.18 This approach permitted the researcher to focus on participants who possessed the particular characteristics that were vital for the study as mentioned above. The 2024 School of Medicine Prospectus indicated that the school has a total of 55 staff members.[19] Of these 55 individuals, the researcher could not ascertain how many were employed by SoM during or after the pandemic. Consequently, the researcher purposefully selected 20 familiar individuals, whose employment began before the pandemic, and remained employed by the institution during and after the pandemic. Of the 30 staff currently employed by the Department of Human, Biological and Translational Medical Sciences, the researcher purposefully selected 7 individuals who met the criteria; 3 out of the 10 from the Department of Medical Sciences; 5 of the 6 from the Department of Maternal and Child Health; and 5 of the 9 from the Department of Surgical Sciences.[19] The researcher aimed to have a minimum of 2 participants from each department inclusive of a senior and junior staff members who met the afore-mentioned criteria.

Data collection tools

The researcher used a semi-structured questionnaire to collect data which permitted the researcher to ask concise questions while simultaneously offering participants some form of free expression. The questionnaire was developed in the English language to maintain consistency across all participants, and ensured organizational coherence and competency in data collection. Some of the data collected included demographics, the general impact of the pandemic, the teaching and evaluation methods before and after the pandemic, the impact of the pandemic on the students' performance, the educators' IT skills and associated challenges, the mental well-being of the educators at the time, and the long-term impact of the pandemic.

Data collection method

The researcher obtained ethical clearance and approval from the Ministry of Health and Social Services which permitted the researcher to proceed with data collection. An online questionnaire was developed using Google forms which comprised of a brief segment on the purpose of the study, a section for informed consent, and the research questions outlined in the questionnaire. Google forms is an online survey administration software that is used to create online forms and surveys with multiple question types.[20] An information pamphlet detailing the purpose and scope of the study, ethical considerations and the researcher's contact details was also created. The researcher then acquired the participants' email addresses from the latest UNAM

SoM contact book and sent out emails requesting for their voluntary participation, attaching the information pamphlet and link to the Google form. A total of 20 participants were requested across all four departments, and a total of 10 responses were received over a period of one month.

Data analysis

The researcher extracted the primary data from Google forms in Excel format. The data was then imported into International Business Machines Corporations Statistical Package for the Social Sciences[26] (IBM SPPS 26) for descriptive analysis, particularly, the descriptive statistic function was used to produce frequency tables. These frequency tables were then entered into Excel to produce graphs of the data collected. The researcher then employed thematic analysis, as outlined by Braun and Clarke,[21] to systemically identify patterns and themes within the data. Codes were then developed to categorize recurring data elements and prominent themes were identified.

Dissemination of results

The aim was to disseminate the research outcomes to benefit students, lecturers and the institution. To achieve this, the researcher submitted the findings and recommendations with the Research Department at the School of Medicine.

Ethical considerations

Ethical clearance and approval were obtained from the Ministry of Health and Social Services. Participants' autonomy was respected by seeking informed consent. A detailed information pamphlet was provided for the participants in order to help them understand the purpose, scope and technicalities of the study. Participants were also provided with the researcher's contact details and were encouraged to ask for clarity as they would need to give informed consent.

To preserve confidentiality, no identifying data was collected from the participants, and the data was securely stored on Google Forms to which only the researcher had credentials to log in. Beneficence was upheld by fully informing the participants of their rights, including the option to withdraw from the study at any time without consequence. No incentives were offered to ensure voluntary participation and to protect them from exploitation. Finally, non-maleficence was upheld by ensuring that the participants were not coerced in any way.

Results

Demographic data

The demographical data is represented in Table 1 below. A total of ten individuals who met the inclusion criteria participated in the study. 60% were female and 40% were male. Concerning age distribution, 90% were between 31-60 years old. Only 10% were above the age of 60. With regards to their positions, 30% were in senior positions of which one served as a Head of Department (HOD), another as professor, and the other as a senior lecturer. 60% of the participants were in intermediate positions of which all were lecturers. The remaining 10% comprised a junior staff who was employed as a technologist.

The participants were employed in four main departments each with various sections. 30% of the participants were employed in the Department of Maternal and Child Health. Another 30% from the department of Medical Sciences. 20% were from the Department of Surgical Sciences, and the remaining 20% from the Department of Human, Biological and Translational Medical Sciences.

In terms of work experience in medical education, 30% indicated they had 11-15 years of experience, another other 30% had 6-10 years, 20% had 16-20 years, and the remaining 20% had 1-5 years work experience.

The study sought educate on the impact of the COVID-19 pandemic on undergraduate medical education in Namibia from the perspective of the medical educators. Firstly, the researcher sought to determine the challenges encountered by medical educators in teaching, assessing and delivering clinical training to undergraduate medical students, as well as challenges posed to their mental health, as underscored by the pandemic.

Figure 1 summarizes the data on challenges faced by medical educators in delivering online education.

Variable		Frequency	Percentage %
Gender	Male	4	40
	Female	6	60
Age range	31-40	3	30
	41-50	4	40
	51-60	2	20
	61+	1	10
Department	A: Maternal and Child Health	3	30
	B: Medical Sciences	3	30
	C: Surgical Sciences	2	20
	D: Human, Biological and Translational Sciences	2	20
Section	A: Pediatrics	2	20
	A: Obstetrics and Gynecology	1	10
	B: Internal Medicine	2	20
	B: Family Medicine	1	10
	C: Anesthesiology	2	20
	D: Anatomy	1	10
	D: Biochemistry and Microbiology	1	10
Position	Head of Department	1	10
	Professor	1	10
	Senior Lecturer	1	10
	Lecturer	6	60
	Technologist	1	10
Range of years of experience	1-5	2	20
	6-10	3	30
	11-15	3	30
	16-20	2	20

Table 1: Demographic data

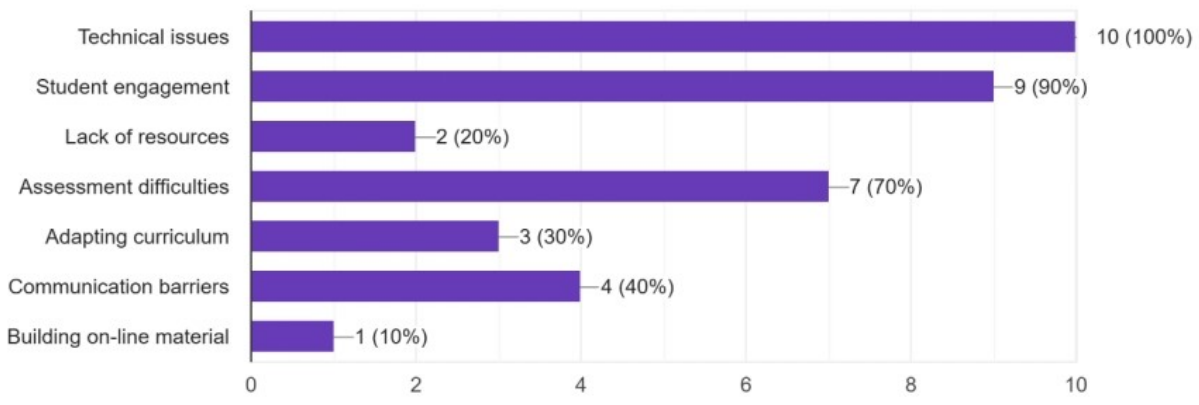

Figure 1: Challenges faced in delivering online education

Challenges

Online learning:

Participants were required to list the modifications made to their teaching methods in response to the pandemic. A key theme that emerged was the transition to online learning, listed by majority of the participants. Other significant changes included reduced clinical exposure and increased use of simulation-based learning. Multiple challenges associated with online learning were mentioned where all participants listed technical issues as a major obstacle. Reduced student engagement and assessment difficulties were also noted to be prominent challenges. Furthermore, most participants observed that student performance had significantly worsened, and that they suffered varying degrees of negative impact to their learning and competency development, emphasizing the complexity of adapting to virtual learning environments. *Figure 2* depicts the structural changes in teaching methods.

Student engagement

When asked to identify possible challenges faced by students which were contributing factors to the reduced student engagement and perfomance, all participants implicated the lack of access to reliable internet as a primary factor. This challenge was fortified by difficulties in adapting to online learning platforms, reduced clinical exposure, limited interaction with peers and instructors. Exacerbating factors such as technical issues with devices and software were also identified, all posing as obstacles to active student engagement. *Figure 3* shows the change in student engagement and *Figure 4* shows the impact of reduced clinical exposure on student performance during the pandemic.

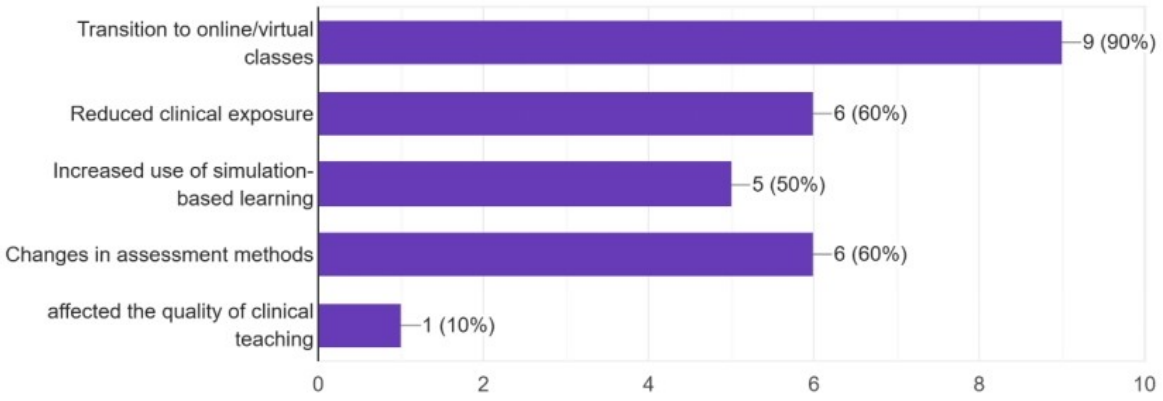

Figure 2: Structural changes in teaching methods

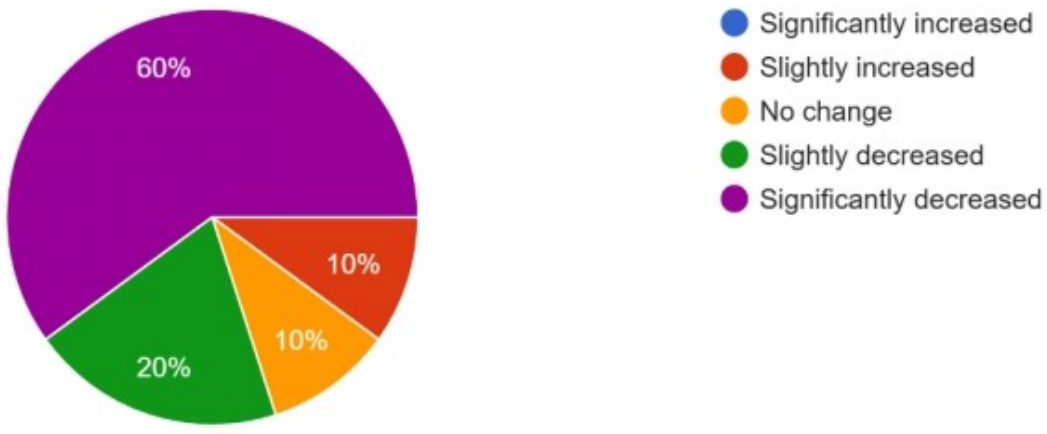

Figure 3: Student engagement during the pandemic

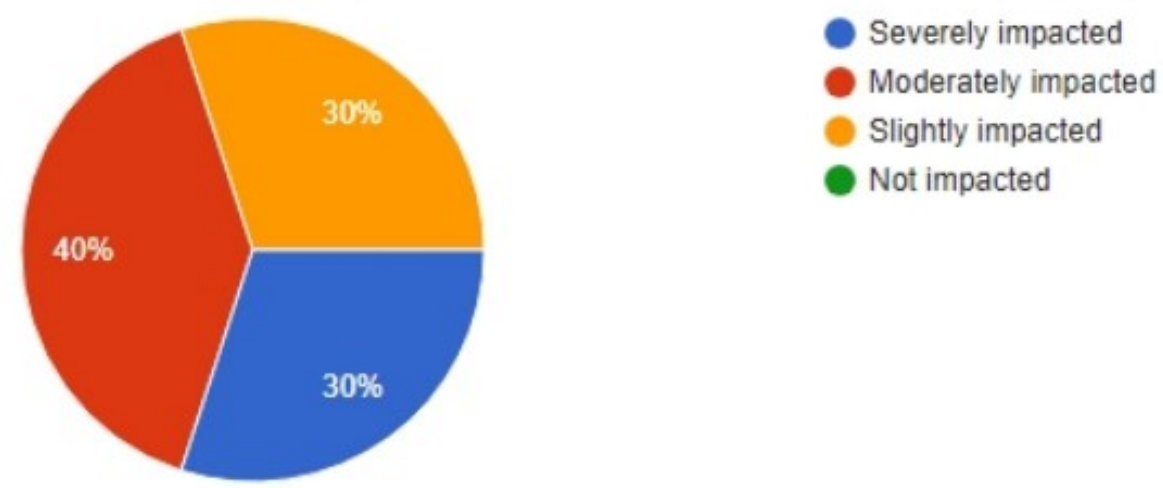

Figure 4: Impact of reduced clinical exposure on student performance during the pandemic

IT skills

Prior to the pandemic, majority of the participants reported occasional use of IT with only some being confident in their IT skills. One participant said: "Not all educators use the on-line platform to its fullest, even after COVID-19". Most (60%) of the participants indicated that they did not receive any formal training on the use of IT tools. Common themes flagged by participants as a key challenge to their IT capabilities were technical issues, followed by reduced student engagement and lack of training to improve their IT skills. Some participants reported the lack of resources with one saying the biggest lesson they learnt from the pandemic was "working with limited resources" and another indicated that he used his personal funds for online lecturing stating: "I used and paid my own internet and worked out N$ 1500 per month", equivalent to $86.52 USD. When asked what support they had for any IT related issues, most (70%) indicated that they relied on online resources and peer support with only a minority (30%) stating that they received institutional support. As appropriately put by one participant: "I learnt from colleagues and from google search". The unavailability of resources and consistent self-development programs by the institution for medical educators to improve their IT skills thus proved to be a limiting factor.

Figure 4 shows the proportion of participants that received training against those that did not. *Figure 5* highlights the main challenges faced in the use of IT tools.

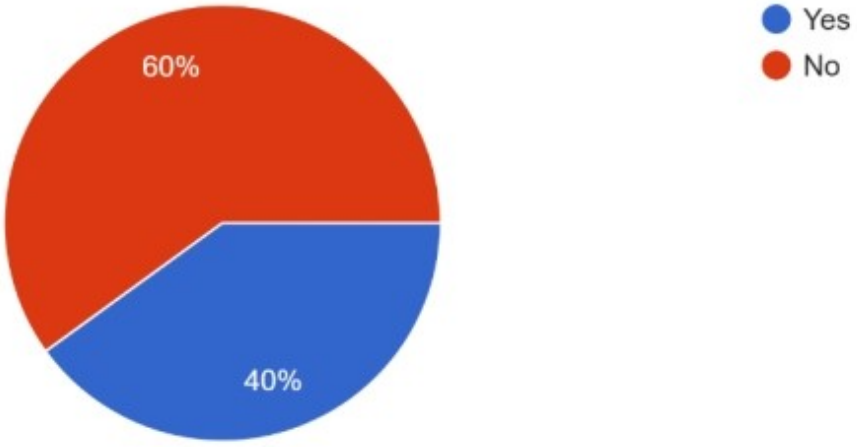

Figure 5: Formal training on IT tools

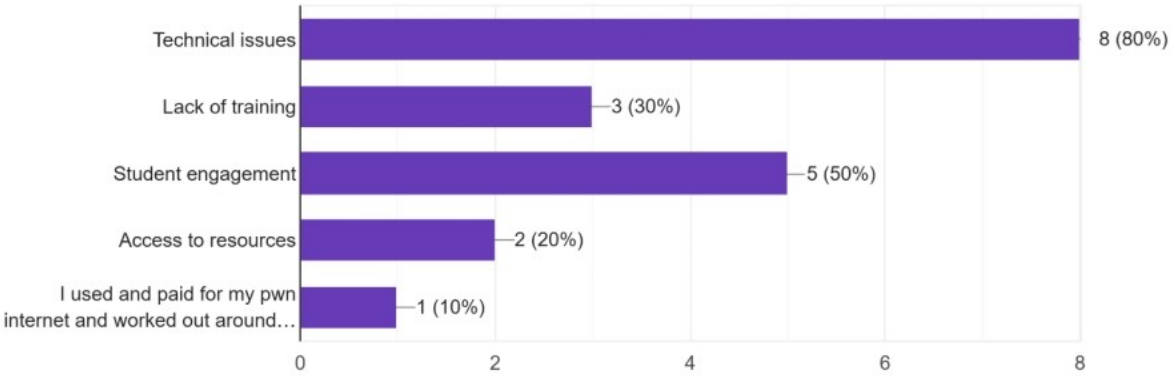

Figure 6: Challenges with using IT tools

Mental health

When asked how the pandemic affected their mental health, 70% of the participants indicated that it affected them negatively, in varying degrees, with only a few who were not negatively affected. A significant percentage highlighted the lack of mental health support from the institution. One participant felt isolated stating that "We were alone and had to make things work for the sake of the students". This statement indicates that the medical educators did not feel supported by the university. This may have exacerbated their mental health challenges.

The researcher then sought to determine the different modifications, opportunities, and innovations put in place to address the challenges encountered in teaching, assessing and clinically training undergraduate medical students during and after the pandemic. Medical educators were asked to reflect on how their teaching, training and assessment practices evolved as well as the long-term changes that have been implemented in their approach to undergraduate medical education. *Figure 6* displays supportive measures implemented to help students with the challenges they faced.

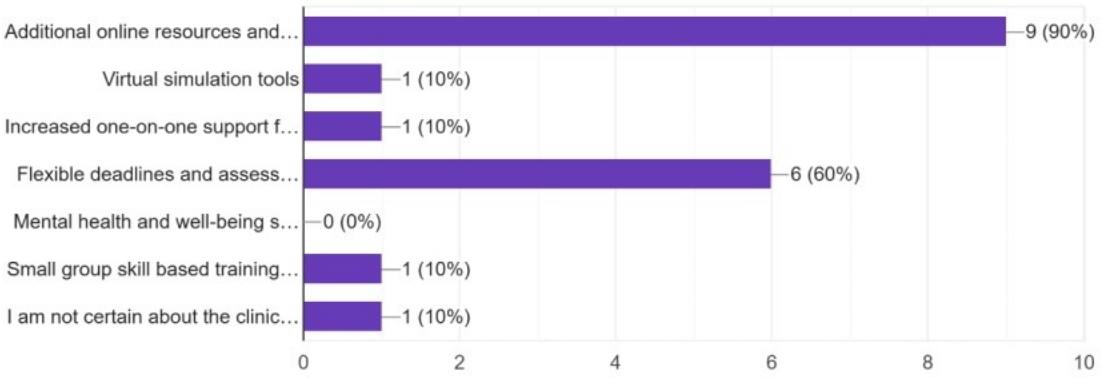

Figure 7: Supportive measures for students

Modifications, opportunities, innovations, and long-term impact

Modifications to teaching and training methods.

As stated above, transition from face-to-face teaching to online learning was the most significant modification. Microsoft Teams, Zoom, Moodle and WhatsApp were commonly used to deliver lessons and learning materials to students during the pandemic. To address the disruption of clinical training, medical educators resorted more to case-based discussions and extended use of mannequins for demonstrations. Only 20% reported making use of small group teachings.

Flexibility

Regarding modifications to assessment methods, the most recurring theme was increased flexibility. This meant flexible methods of assessment such as take-home assignments, online examinations and simulations. Medical educators also gave students flexible deadlines for tests and assignments. A notable recurring theme was the use of virtual simulations for practical assessments. Students were also provided with additional online resources. Consequently, the increased flexibility and additional resources helped to address the issue of decreased student performance and engagement. When asked which solutions were most effective in mitigating challenges faced by students, one participant said: "Flexibility and clear communication. Also, balancing resources with cognitive load in mind as well as resource limitations".

IT skills

Prior to the pandemic, 30% did not feel confident in their IT skills. However, after the pandemic, all participants reported having increased confidence, with some noting that they felt highly confident in their IT capabilities. Although 60% of the participants indicated that they did not receive any IT training from the institution, 40% of participants reported receiving training in different forms, of which 60% received training through online courses and webinars (refer to *Figure 4* above). All those that indicated that they received training felt that it was effective.

Blended and hybrid learning

When asked what long-term changes they have observed, the most recurring themes were the use of hybrid learning models and permanent integration of online learning. Particularly, participants advocated for the efficiency of hybrid learning methods saying "When used appropriately, the online platform is such a useful platform. It saves time and energy, especially for meetings". This sentiment was supported by others stating that hybrid learning models were "necessary adaptations" and "should be embraced". A particular mention was made to MOODLE by one participant stating that "MOODLE is important". "Blended teaching methods" were also a prominent theme stating that "medical curricula should incorporate more IT innovations but not totally forget the place of physical interaction in learning". As summarized in the words of one participant: "It was both a big challenge but also a big opportunity. It changed our perception about how useful the virtual useful aspect is". This shows that overall, participants recognized that the most prominent thing highlighted by the pandemic was the place of technology-based methods in undergraduate medical education. Figure 7 shows the long-term changes in undergraduate medical education.

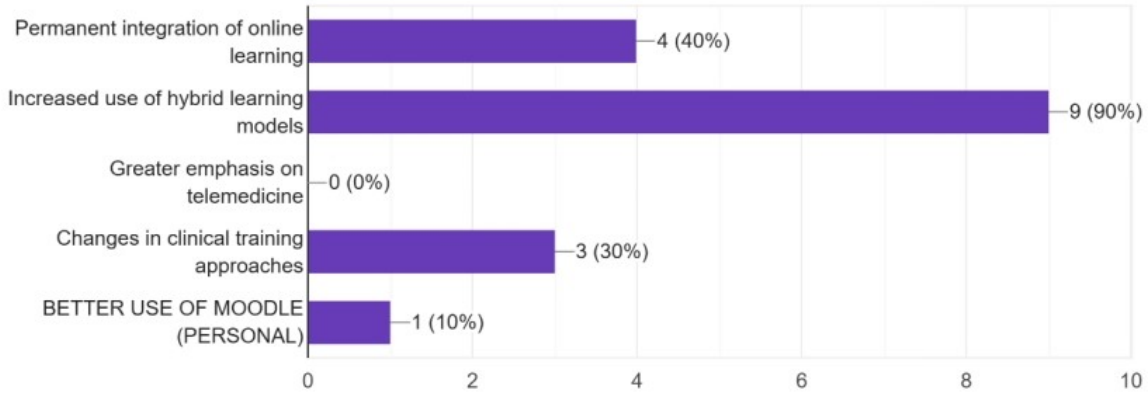

Figure 8: Long-term impact

Limitations of the study

The inclusion criteria were highly specific, resulting in a smaller number of eligible participants from the School of Medicine. Of those that were eligible, only a few responded given the nature of their busy schedules. Additionally, the study was conducted over a period of one month, placing a further constrain on participation. Conducting the study over an extended period could have allowed more eligible participants to respond to the study.

Discussion

The results of this study indicated that the COVID-19 pandemic significantly affected undergraduate medical education in Namibia, a shared experience globally. The change that stands out the most was the rapid transition from traditional face-to-face teaching to online learning. Along with this major transition, the IT skills of the educators and IT infrastructure of the university were tested. 60% of the participants indicated that they did not receive any form of IT training from the institution and resorted to their peers and online resources for support, pointing to the lack of preparedness of the institution. This is in keeping with the findings of Bozkurt et al. that Namibia was not prepared for the transition to online learning.[15] On a global scale, Adefuye et al. found that medical educators were required to adapt quickly without sufficient institutional support, as evidenced by the findings in this study.[6]

As reported by 60% of the participants, the rapid transition to online learning resulted in a significant decline in student engagement and performance. This was owed to multiple contributing factors such as the reduced clinical exposure, technical issues, and limited interaction with instructors and peers. Challenges with finances worsened the situation as many students lacked access to reliable devices and the internet. Rahman et al. supported this finding as their study indicated that students in low-middle income countries, such as Namibia, were severely affected by the educational disruption caused by the COVID-19 pandemic.[9]

Seventy percent of the participants indicated that the COVID-19 pandemic had a negative impact on their mental health, which was made worse by the lack of institutional support. Although no particular studies were conducted to assess the impact of the pandemic on the mental health of the educators, the lack thereof emphasized the dire need for accessible and consistent mental health resources for both medical educators and students.

Conversely, the COVID-19 pandemic also had a positive impact as it revealed opportunities for innovation. The findings in this study revealed that the medical educators in Namibia resorted to a flexible approach inclusive of take-home assignments, online examinations, flexible deadlines for assessments, and simulations. Adefuye et al. noted similar assessment modifications in the UK, where online examinations were permitted, and in Asia where simulations and virtual learning platforms were adopted.[6] In line with the global observation made by Hays *et al*., 70% of the participants in this Namibian study advocated for the permanent integration of online learning and blended/hybrid models stating that these models were more efficient, time saving and vital for the resilience of undergraduate medical programs in Namibia.[5]

Conclusion

The main objective of the study was to explore the impact of the COVID-19 pandemic on undergraduate medical education in Namibia as perceived by the medical educators. The study revealed significant limitations within the university system and notable challenges on the part of the medical educators in ensuring continuation of education in the face of disruptions, particularly focusing on challenges with IT resources and capabilities, alternative methods of teaching and training, and the lack of institutional support for the educators. On the other hand, it highlighted the pivotal role of long-term changes such as the adoption of hybrid learning models in ensuring resilience of undergraduate medical education to mitigate the impact of disruptions such as the COVID-19 pandemic.

Recommendations

In order to improve educational outcomes for undergraduate medical students, it is the recommendation of this study that blended learning models are integrated in the delivery of the curriculum and that their adoption is actively encouraged. IT infrastructure should be strengthened for the smooth facilitation of online learning. Furthermore, options for clinical training should be expanded. Mental health services should be made fully and consistently available to both students and educators. Lastly, the development and enhancement of current preparedness plans is vital in containing future educational disruptions.

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