



WJMER

World Journal of Medical Education and Research

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

Case Presentation—the Key Which Unlocks the Diagnosis

A Rare Case of Closed-Loop Small Bowel Obstruction Secondary to Herniation Through A Defect in the Broad Ligament of the Uterus- A Case Report

Survey of Medical Students' Opinions Regarding their Training in the Discipline of Infectious Diseases

A Comparison between Primary and Secondary Breast Angiosarcoma: Our Local Experience

Evaluating Medical Students', Clinicians', and the Public's Perspectives on the Integration of Medical Associate Professionals (MAPs) into the NHS

The Hidden Dangers of Fast-Food and Processed Treats: What Everyone Needs to Know



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Introduction

The World Journal of Medical Education and Research (WJMER) (ISSN 2052-1715) is an online publication of the Doctors Academy Group of Educational Establishments. Published on a quarterly basis, the aim of the journal is to promote academia and research amongst members of the multi-disciplinary healthcare team including doctors, dentists, scientists, and students of these specialties from around the world. The principal objective of this journal is to encourage the aforementioned, from developing countries in particular, to publish their work. The journal intends to promote the healthy transfer of knowledge, opinions and expertise between those who have the benefit of cutting edge technology and those who need to innovate within their resource constraints. It is our hope that this will help to develop medical knowledge and to provide optimal clinical care in different settings. We envisage an incessant stream of information flowing along the channels that WJMER will create and that a surfeit of ideas will be gleaned from this process. We look forward to sharing these experiences with our readers in our editions. We are honoured to welcome you to WJMER.

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A WELCOME MESSAGE FROM THE EDITORS

Dear Reader,

It is our great pleasure to bring you the thirty-first edition of the World Journal of Medical Education and Research (WJMER). This edition features a diverse selection of research articles, case reports, qualitative studies, and health-focused analyses. Each piece contributes unique insights to ongoing discussions in medicine, public health, and healthcare education, offering readers both practical knowledge and thoughtful perspectives.

The opening article 'The Impact of the COVID-19 Pandemic on Undergraduate Medical Education in Namibia: The Educators' Perspective', Likando and Adesiyan explore how Namibian medical educators adapted to online learning during the pandemic, highlighting technological challenges, innovation, and the adoption of hybrid teaching methods for future preparedness.

In his 'Case Presentation – the Key Which Unlocks the Diagnosis', Fisher highlights the importance of structured case presentations in medical education and practice to enhance diagnostic accuracy, patient care, and professional satisfaction.

'A Rare Case of Closed-Loop Small Bowel Obstruction Secondary to Herniation Through a Defect in the Broad Ligament of the Uterus: A Case Report' by Komolafe *et al.* describes a rare internal hernia causing small bowel obstruction. The authors emphasise the diagnostic and therapeutic value of laparoscopy in female patients with unexplained abdominal pain.

The subsequent article by Chan Tin Ho *et al.*, entitled 'A Comparison between Primary and Secondary Breast Angiosarcoma: Our Local Experience', reports two local cases of breast angiosarcoma, highlighting differences between primary and secondary types, diagnostic challenges, and the current uncertainty around adjuvant treatments.

The paper 'Evaluating Medical Students', Clinicians', and the Public's Perspectives on the Integration of Medical Associate Professionals (MAPs) into the NHS' by Khanna *et al.* investigates attitudes toward MAPs in the UK's National Health Service (NHS), noting concerns about training, patient safety, and professional development. The study advocates clear role definitions and robust governance for sustainable integration.

The final article, 'The Hidden Dangers of Fast Food and Processed Treats: What Everyone Needs to Know' by Abraham and Enoch explores the health risks of fast food and ultra-processed foods, including obesity, chronic disease, and cancer. The article calls for public awareness, dietary reform, and a return to whole and minimally processed foods.

We sincerely hope that you find each article in this edition educational, enlightening and interesting to read.

Ms Karen Au-Yeung
Associate Editor

Dr Rebecca Williams
Associate Editor

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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 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 Sciences²⁶ (IBM SPSS 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

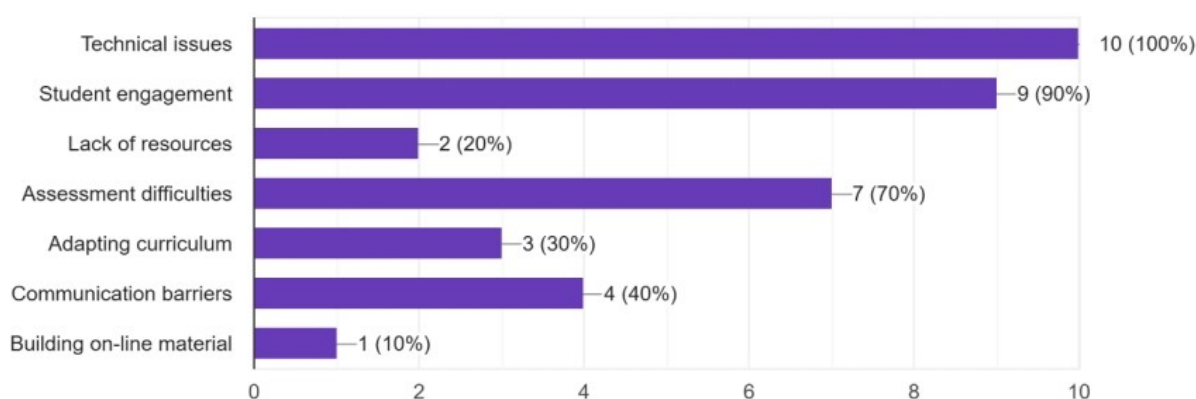


Figure 1: Challenges faced in delivering online education

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 performance, 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.

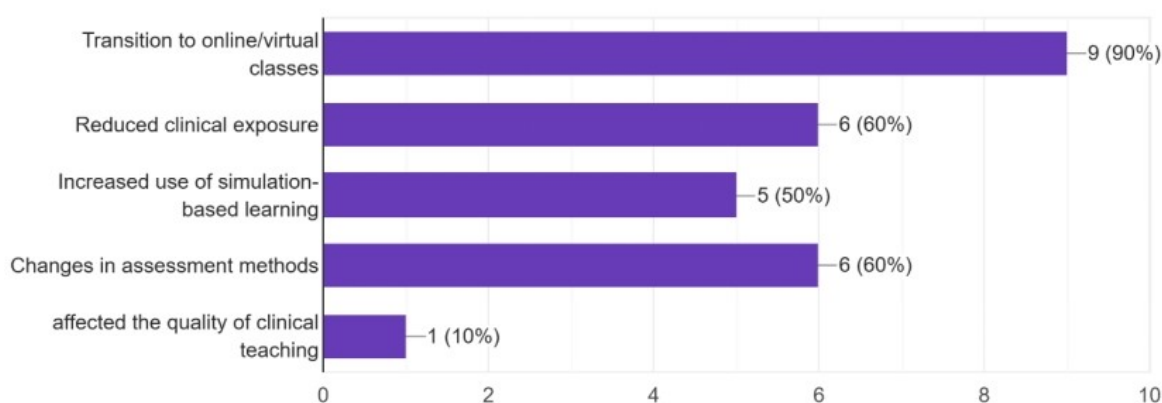


Figure 2: Structural changes in teaching methods

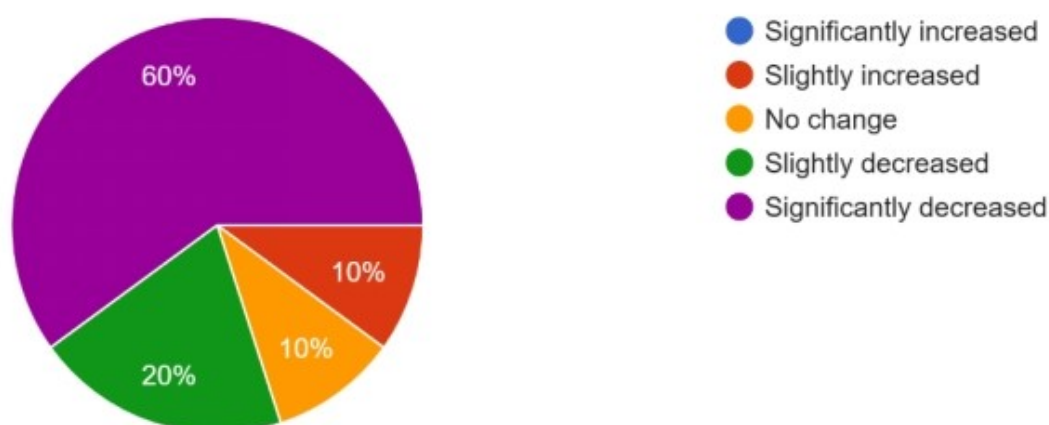


Figure 3: Student engagement during the pandemic

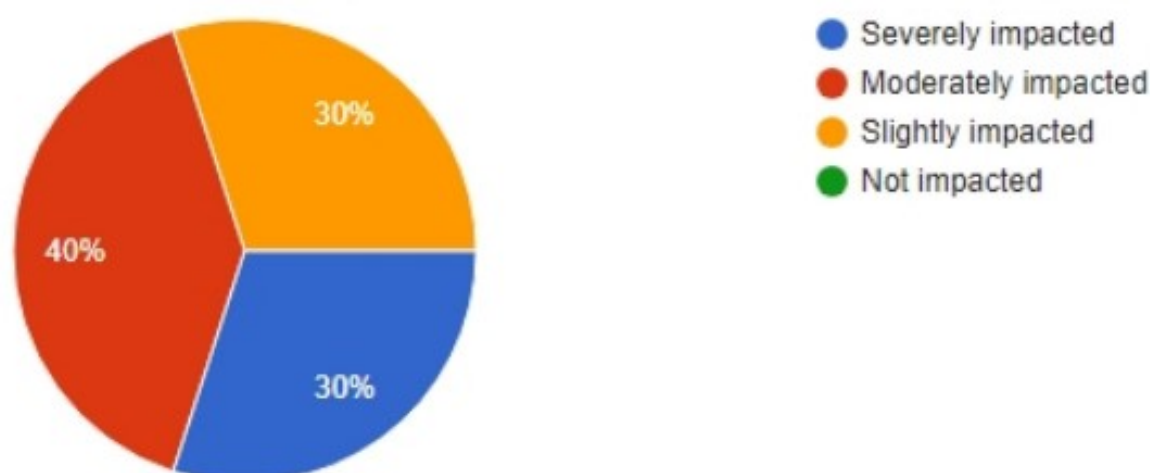


Figure 4: Impact of reduced clinical exposure on student performance during the pandemic

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.

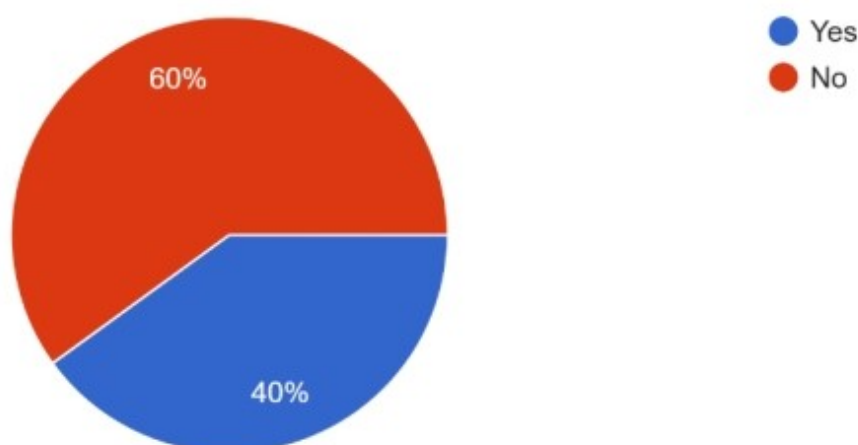


Figure 5: Formal training on IT tools

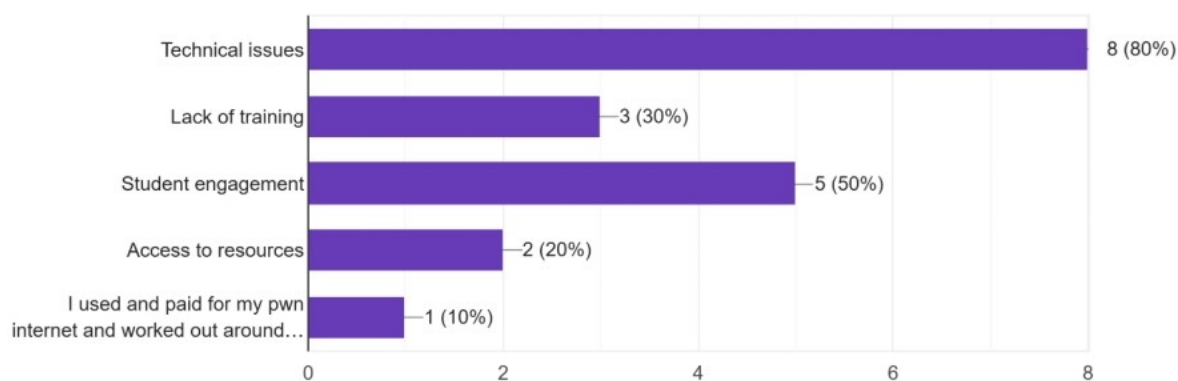


Figure 6: Challenges with using IT tools

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.

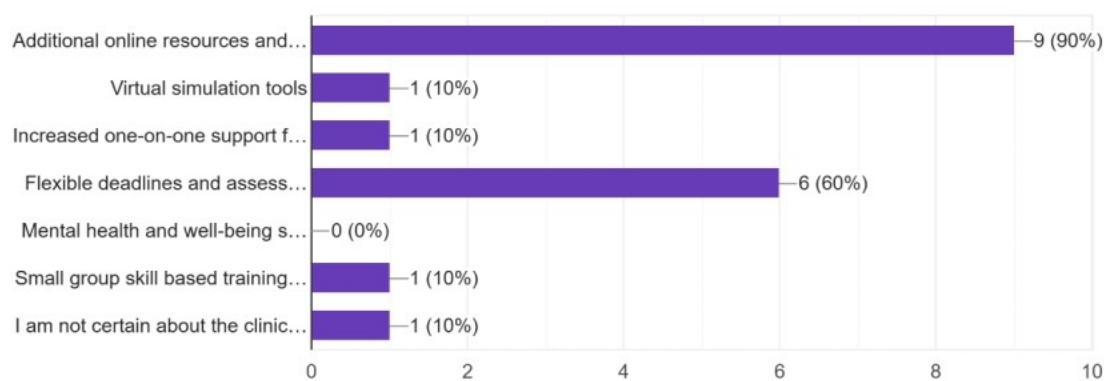


Figure 7: Supportive measures for students

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.

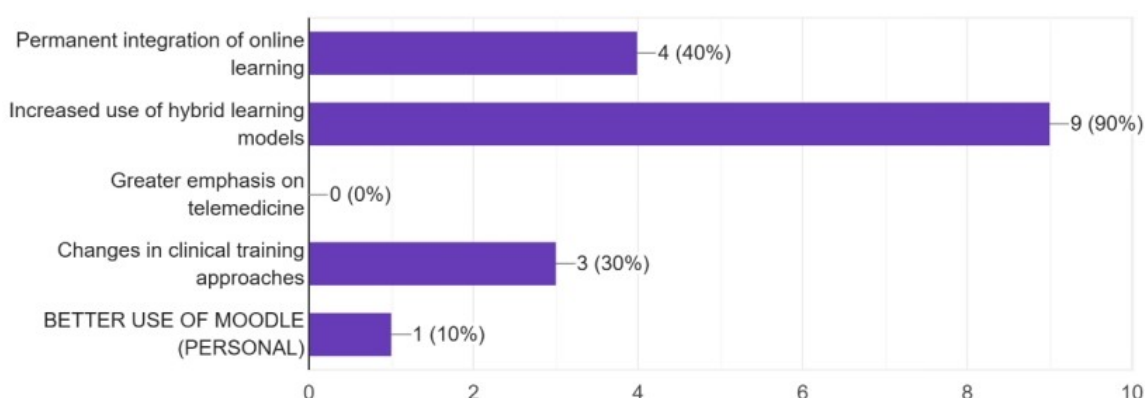


Figure 8: Long-term impact

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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Case Presentation—the Key Which Unlocks the Diagnosis

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Abstract:

The student of medicine spends a lifetime presenting patient cases to others in a variety of formats: communicating to other physicians in the emergency department and other parts of a medical center, on rounds, in handoffs, in formal conferences, and in electronic medical records. Presentations should be organized, yet succinct with sufficient detail to help patients who are the main beneficiaries. The ability to present well can be taken to the bedside or in clinic with the same organizational approach and can focus a detailed physical examination of the culprit organ system which greatly assists diagnosis. The satisfaction of unraveling a diagnoses is potentially a lifelong hedge against physician burnout.

Key Words:

Organized Case Presentations, Expert Diagnoses

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The student of medicine spends a lifetime presenting patient cases to others. Learning to present well ordinarily has a very rough beginning and likely peaks as a senior resident or sub-specialty fellow. After I had been an attending physician on Internal Medicine or on the consultation service for Infectious Diseases and had listened to thousands, I began to ponder why case presentations are such a mandatory and integral part of the training of young physicians. I came up with many of the usual explanations:

1. To communicate to other healthcare workers about a patient in the emergency department (ED), an intensive care unit (ICU), the hospital wards, or a clinic setting in a clear, concise fashion. Such a presentation should expeditiously help a suffering individual.
2. To briefly describe the problem in the medical record in a consult request and the reason for the consultation.
3. For a succinct daily report of the progress of previously admitted patients on rounds on the general wards or ICU.
4. For “handoffs” about patients from a physician going off-service or off-call to ensure that the physician coming on-service or on-call is aware of crucial follow-up needs for sick patients.
5. To demonstrate to an attending that a presentation by a student is organized, confident, concise, but contains the necessary details about the patient to whom he or she is assigned.
6. To give a formal, organized, high-quality

summary to an audience in a conference setting as an introduction to a speaker’s planned topic.

Over the many years I have been in medicine I have heard countless presentations by physicians and trainees of all levels of experience. Some were frankly awful, blow-by blow accounts containing unnecessary, disjointed, and extraneous information which had the listeners stealing furtive glances at their watches. Some were acceptable, but still chaotic and verbose. I found myself in awe of that rare trainee who could give such a concise and clear enough description that the listener could almost picture the suffering individual and develop at least a brief list of possible diagnoses immediately. I had noticed for years that one of the key elements of those great presentations is organization. I remembered back with embarrassment to my own presentation struggles as a medical student. I was initially totally lost when presenting to my superiors and was very haphazardly providing too much distracting detail far distant from the problem at hand. Presenting at conferences made me hone my skills somewhat, but in my PGY 2 year I heard several outstanding presentations by one of my interns in particular who wounded my pride and showed me how far I had to go as a communicator. Whether I taught him any internal medicine is debatable, but I thank him for his contributions to my own case presentations. Usurping much of his technique yielded me an occasional, “That’s one of the best presentations I’ve ever heard” from other physicians at a conference. I still cringe at my failure

to tell those physicians that I commandeered his method and that he deserved the credit. (Vanity vanity, did ever I offend thee?). One of the tools I expropriated from him was to provide the most detail about the patient's chief complaint for the listeners. This made me arrive at the realization that the history of present illness is principally a detailed exposition of some system of the body which has gone afoul. While other systems can be affected by the culprit organ, cramming too much detail about them in the HPI is distracting for the listener or reader. That information is best provided later in the review of systems (ROS) section if relevant.

As I continued to ponder, I had an epiphany as a young attending which some of my colleagues likely discovered years before I did. The six reasons listed above are all important, but it suddenly dawned on me that the principle value of being able to present well arguably begins at the patient's bedside, in the ED, or in the clinic. Skillful case presentation is a powerful tool which can be adapted to the initial patient encounter to enable a physician to think clearly and in an organized way about a patient's problem. Such clarity of thought is the beginning of the diagnostic pursuit.

From this belated revelation, I then conceived of a template previously stolen from some of the great presenters I had heard into which a new patient could be entered in the taking of the history and in the performance of the physical examination. It could be done with little note taking, more eye contact, and, most importantly, would organize the thinking of the interviewer as the history unfolds. Furthermore, if the same template were to be followed later, it would be very easy to remember and communicate to another physician, almost immediately after the encounter if necessary. So let's begin at the bedside.

Before meeting with the patient, it is prudent to quickly scan any medical records available to give an overview of the health of the person about to be interviewed. The template for the HPI, I reasoned, could be divided into three paragraphs. Paragraph #1 is the most important and involves the comprehensive unravelling of the patient's chief complaint. In patients with multiple complaints, a tactful and polite physician could make them choose among their troubles to identify their principle concern. For example, the physician might begin by acknowledging the patient's many symptoms like this: "Mr. Jones, you have really been through it recently. I want to hear about all of your troubles, of course. For a moment, could you pretend that I was a doctor who had trouble dealing with many symptoms all at once, but could do pretty well with just one? Which of all your symptoms would you

have me fix first?" Having chosen one, the patient would then enter my HPI template with *that chief complaint*.

Once the physician decides what the patient's chief complaint is, the one and only focus should be to thoroughly understand it before proceeding. Unlike an office-visit questionnaire, it should be elucidated in the patient's own words as much as possible. Most physicians typically interrupt the patient's story in a matter of seconds perhaps because of pattern recognition, bias, or in the interest of time. Such an approach may yield a diagnosis for some very common conditions, but a life threatening or unusual illness could be missed and progress resulting in the demise of the patient. The remorse felt by the physician in a hurry may last an entire career and beyond.

In a safer diagnostic strategy, the physician could begin by asking about the duration of the chief complaint. For example, headache of one hours' duration might result in the patient's death whereas a headache of 40 years' duration has not killed them yet. Learning the duration gives the physician a working overview and urgency of the problem. Next, an open-ended, "Tell me about your pain, Mr. Jones" and listening carefully in silence until the patient finishes the initial description is an appropriate beginning. When it is the physician's turn to speak, a simple, "What were you doing when the pain came on?" is an important part of the early inquiry. Many patients use the term, 'suddenly' to describe the onset. For an expert diagnostician, this term needs further clarification to distinguish 'instantaneous' from a crescendo onset over a few seconds to minutes or longer. A follow-up and open-ended question might then be, "What did you try to do about the pain?" to begin to discover aggravating or relieving factors. The character of the pain or discomfort should be carefully sought after. Some patients have difficulty with pain description often defaulting with words like 'hurt'. Here a physician may transition from listening to suggesting further clarification of what the pain might have been like, ie any of the following: 'aching, throbbing, burning, pressure-like, tearing, or cramping.' An all-important query is to find out precisely the spot where the discomfort is localizing, that is, the exact area of the body in centimeters if necessary and determining if it remained localized or moved in any direction. (It is extremely important to ask whether a patient with chest pain has it at the time of the interview since any description even hinting of an acute coronary syndrome is an emergency requiring a specific protocol which includes limiting the history to a matter of minutes.) The duration and frequency of the discomfort and its relationship to activity, meals, and time of the day should help the

listener identify the culprit system. Nocturnal pain is important to note and suggests a more serious cause. Another important fact to discern is whether the discomfort has changed since it began. To that end, the physician might ask the patient to compare the present to that of its beginning: "Mr. Jones, is your pain staying the same, getting better, or getting worse?" These questions may seem elementary, but the reader is reminded that Paragraph #1 is still being detailed and the physician must endeavor to keep the patient on-point and not allowed to stray to associated symptoms or other possibly distracting information. If patients do try to stray, a polite, "Hold that thought, Mr. Jones. I want to hear about it in a moment, but let's get back to your pain. I still don't completely understand it." is not likely to offend. The purpose is to enable the physician to think in an orderly fashion and easily remember the finer details of the discomfort without distraction. An exhaustive understanding of the chief complaint should suggest or begin to suggest which organ system is the primary cause for the patient's presentation. It is recognized that the offending system may well impact other organs negatively.

Once the interviewer is reasonably certain of all the facts surrounding the chief complaint, but not before, Paragraph #2 of the interview can commence. Its purpose is to take an inventory of the associated symptoms. The physician might begin with, "Okay, Mr. Jones. I think I understand the main thing bothering you pretty well. What other symptoms were you having besides the discomfort you were experiencing?" While silence in a conversation can be awkward at times, a keen diagnostician should not be afraid to wait without speaking for an answer. The associated symptoms often confirm the suspicion of the causative organ system, but might take the history in a different direction altogether. Keeping them in a separate paragraph from that dealing with the chief complaint facilitates orderly thinking and is easier to remember in an oral presentation which might follow the encounter. Furthermore, it makes for a very organized written note. Readers of such a note will also benefit from such organization.

The final paragraph (Paragraph #3) should complete the HPI whereby the physician takes inventory of the symptoms in the suspected system which were not spontaneously mentioned. For example, if the suspected system based on Paragraphs #1 and #2 in a patient with chest pain was the cardiovascular system and the patient described only the chest pain and accompanying dyspnea, the physician should specifically ask about palpitations, orthopnea, paroxysmal nocturnal dyspnea, diaphoresis, presyncope, syncope, and edema. Should the patient

confirm one of these symptoms, it would be placed for logical thinking and communication later into Paragraph #2. Thus, Paragraph #3 should principally contain a list of symptoms in the culprit system which were denied by the patient. Many physicians-in-training presenting such a patient make the listener or the reader wait until later in the section formally labelled ROS to list these when they are most pertinent in the HPI and belong there.

Since approximately 70% of diagnoses can be made from history, the three-paragraph approach is one method which can assist a physician to think in an orderly way while listening to the patient. Being relatively certain which organ system has caused the patient's presenting symptoms, it follows that it should also be the principal focus of the ensuing physical examination. Pertinent findings are less likely to be missed because of such an emphasis, especially if the examiner tries to anticipate and predict what should be present in persons with that history. For example, if the history suggests an acute pulmonary embolism, the right ventricle should reveal evidence of a sudden increase in pulmonary pressure. Inspecting neck veins and endeavoring to hear a loud S2 and P2 are suggestive. Discovery of a confirmatory S3 or a holosystolic murmur both of which increase with inspiration is likely to generate much more satisfaction and enthusiasm than a typical cursory auscultation of the heart, not to mention altering the direction of the workup in a sick patient. Likewise, in an adolescent with two weeks of fatigue and a sore throat, a conscientious physician expecting to palpate an enlarged spleen is unlikely to miss it if it is present and can confidently advise against contact sports temporarily and perhaps save a life.

It is obviously impossible to perform a detailed examination of every organ system in the body with this focus, nor is there time in a busy ED or clinic. The same is true for hospital physicians with many assigned patients. However, one could convincingly argue that a thorough examination of the organ system which is likely causing the problem is the least a doctor owes a patient.

The HPI taken from a patient using a three-paragraph template and the focused examination are easier to remember and recount verbally to another physician immediately if necessary. In addition, it should facilitate the entry of a succinct and orderly note into the electronic medical record. Evaluating physicians will very likely grade students whose presentations and notes are of this quality very favorably.

A few additions to the template for the oral presentation on rounds or in a conference which

could raise the quality from solid to outstanding are appropriate. One of these is the introductory sentence of the HPI which gives the listener (or reader) a quick overview of the patient's health status prior to evaluation. An introductory sentence might begin with, "Mr. Jones is a 38-year-old man who was in his usual state of good health until three days prior to admission when he..." For the more complicated patient, the presentation could start with, "Ms. Smith is a 72-year-old woman with type II diabetes, hypertension, and a coronary artery bypass graft in 2017 who was in her usual state of fair health until three days prior to admission when she..." Such an introductory sentence is the start of the thinking process for the listeners (or readers) and is an attention-grabber.

Oral presentations can be further enhanced by providing only details in the past medical history, family history, and social history which are relevant to the HPI. Giving a complete list of medications along with doses is not only unnecessary, but makes the listeners impatient to "get on with the case." These details belong in the medical record.

For the expert diagnostician the main purpose of the ROS is to identify symptoms which might be more important than what the patient came in for and taking the workup in an altogether different direction. For example, if the patient presented for evaluation of low-back pain, but gave the history of hematuria, the presenter should provide the listeners with other accompanying symptoms in the genitourinary system (ie. urgency, frequency, dysuria, hesitancy, nocturia, or pyuria). As to presenting the ROS orally or in writing, it may be summarized quickly by saying, "The review of systems was completely negative or was negative except for the following system."

The description of the physical examination of the organ system causing the problem should be given in the same high-quality detail as the history. The remainder of the exam can be summarized with some familiar cursory terms.

Pertinent, positive laboratory values and imaging findings should be presented just prior to giving an

assessment of the patient's problem and plan for evaluation and treatment.

In the event that the listener(s) to an oral presentation could have lost concentration or were distracted by a page or message from another provider, another component of a quality oral presentation is to provide a one-paragraph summary of the case just presented. It might begin with, "So in summary, the patient is a 36-year-old diabetic man who presented with three days of fever, cough, dyspnea, and pleuritic chest pain. Pertinent findings were a temperature of 39C, a respiratory rate of 24, and consolidative changes in the right lower lung field, leukocytosis, and an infiltrate on chest x-ray in the right lower lobe. Sputum Gram's stain was a good quality specimen and revealed Gram-positive diplococci. Our working diagnosis is pneumococcal pneumonia and our plan is to begin ceftriaxone until improved and transition to oral therapy at discharge.

Finally in an oral presentation the assessment of the problem should be given with conviction stating what the presenter believes is the most likely diagnosis. Following that, other diagnoses to be considered should be listed along with the plan for evaluation. All too often, presenters give only a list of possibilities and no one listening really learns anything. Committing oneself to a specific diagnosis is an important lesson for the presenter-- right or wrong. Furthermore, figuring out the problem from the HPI, physical exam, and basic labs is akin to Sherlock Holmes solving a murder and helps keep enthusiasm for diagnosis high. The daily challenge of diagnosis can be one of the best hedges against physician burnout.

Other important problems, related or unrelated, should be listed with an appropriate plan for management and will complete the presentation and write-up.

As previously indicated, the patient is the principle beneficiary of the physician or trainee who has the ability to skillfully present a new patient verbally or in writing, but the diagnostic dividends which it pays the presenter will accrue for an entire career.



A Rare Case of Closed-Loop Small Bowel Obstruction Secondary to Herniation Through A Defect in the Broad Ligament of the Uterus- A Case Report

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Abstract:

Internal hernias in intra-abdominal spaces or cavities may cause small bowel obstruction¹. However, internal hernia through the broad ligament of the uterus remains rare, accounting for approximately 4% of internal hernia cases^{2,3}.

Diagnostic dilemmas are common with this variant of internal hernia, often leading to delayed treatments⁴.

We present a rare case of a 34-year-old female with a day history of significant suprapubic pain and nausea.

Examination revealed a patient with mild tachycardia and suprapubic tenderness with normal laboratory workup.

Contrast-enhanced computed tomography (CECT) scan showed a closed-loop small bowel obstruction in the pelvis without demonstrating the cause of this.

Diagnostic laparoscopy revealed an internal hernia through a defect in the left broad ligament of the uterus, causing closed-loop small bowel obstruction. The hernia defect was managed with intracorporeal suturing after release of bruised but viable incarcerated small bowel.

With this report, we emphasise the importance of diagnostic laparoscopy as a vital diagnostic and treatment tool in patients with bowel obstruction and an unclear cause on CECT.

Herniation through a defect in the broad ligament of the uterus should be considered in females presenting with suprapubic pain and CECT findings of bowel obstruction with no clear aetiology.

Key Words:

Internal Hernia, Broad Ligament of the Uterus, Hernia

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Introduction

Internal hernias account for about 1% small bowel obstruction^{1,2}. The earliest recorded literature on internal hernia through the broad ligament of the uterus dates back approximately three-quarters of a century⁵, and very few reports of this condition are available in the literature to date. They have been recently referred to as broad ligament hernias (BLH)⁶. Small bowel, as well as other viscera, have been implicated in herniation through the broad ligament hernias⁷.

Case presentation.

This is the case of a 34-year-old lady who presented to our acute surgical department with a day's history of severe lower abdominal pain of a day's duration. There was associated nausea, but no vomiting.

She had presented 5 months prior with lower abdominal pain similar to the current episode which resolved with non-operative management.

Relevant history include- laparoscopic appendicectomy 3 years prior, a history of two previous vaginal deliveries and colposcopy evaluation for cervical polyp, which was found to be normal.

Clinical examination revealed a flushed patient in painful distress, with mild tachycardia of 96 bpm, and otherwise normal vital signs.

Abdominal examination revealed stigmata of previous laparoscopic surgery, a generally soft abdomen. There was suprapubic tenderness worse on the left.

Striking was the fact that the patient's pain was out of proportion to clinical findings.

The blood workup was normal, except for a mildly elevated CRP of 11 mg/L.

CECT showed a dilated segment of small bowel in

the pelvis, described as a closed-loop obstruction with two distinct transition points and small bowel fecalization.

Given the clinical and radiological findings, without a clear cause, a clinical decision was made to proceed with diagnostic laparoscopy.

This revealed small bowel herniation through a 2.5 cm defect in the left broad ligament of the uterus with two transition points. We reduced the bruised but viable small bowel from the defect. No bowel resection was needed. The defect was closed with a "figure-of-eight" 2/0 Vicryl suture.

The patient made an uneventful recovery and was discharged home on the second postoperative day.

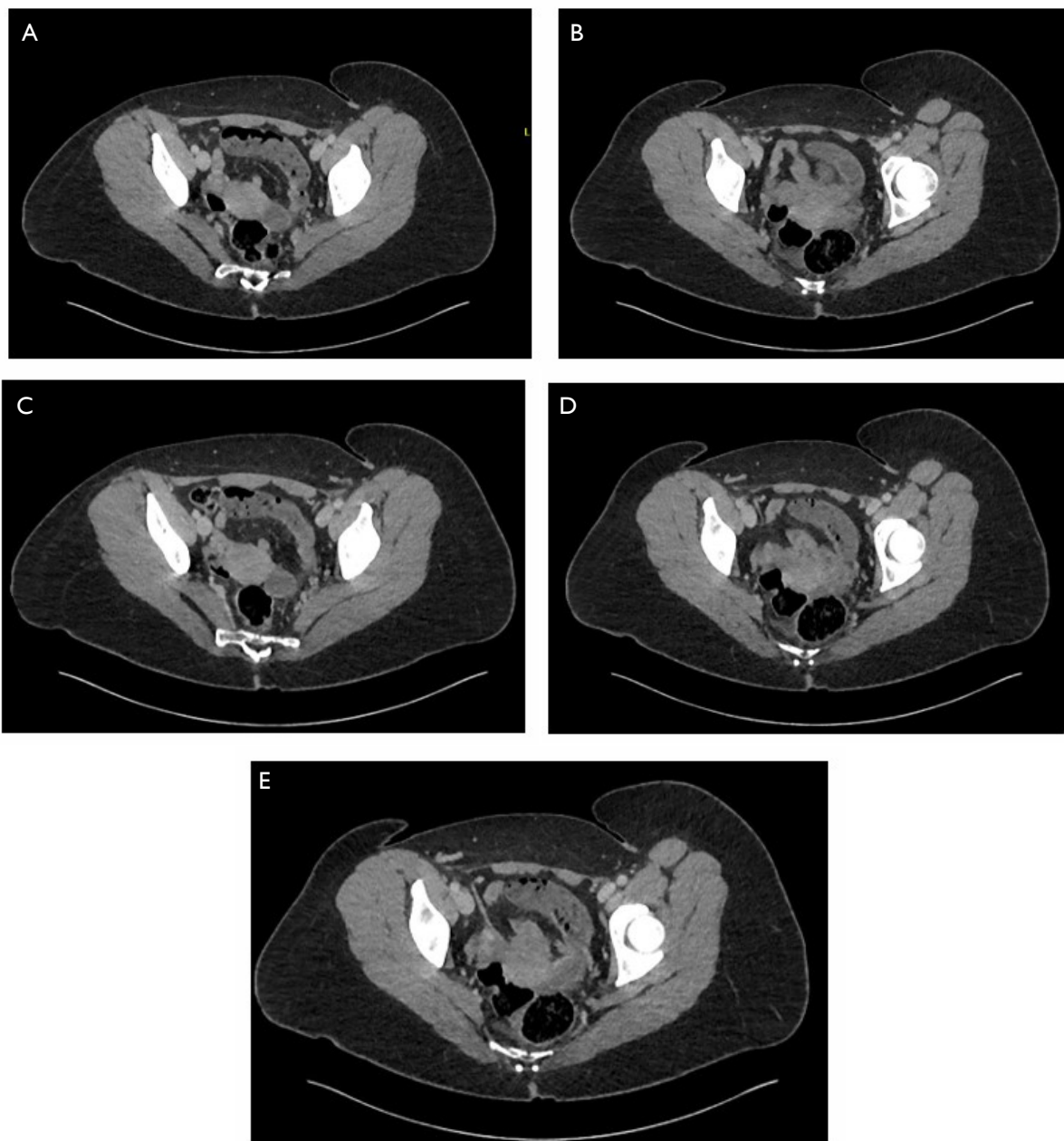
See Figure 1 (A-E):

Discussion

A variety of acquired predisposing factors, such as multiparity and pelvic inflammatory disease, have been described for broad ligament hernias^{2,6}

The critical factor that led to surgical exploration in our case report was the finding of abdominal pain, which was disproportionate to the clinical findings. The patient was in severe pain with a relatively soft abdomen to palpation.

Blood workup with findings of metabolic acidosis and rising lactate on arterial blood gases may sometimes point to the presence of clinical



deterioration or raise the suspicion of pending or already ischemic bowel/ viscera. However, this was not the case with our patient, whose blood workup was normal, except for a mild rise in CRP to 11 mg/L. Her normal laboratory test may be explained by compensation in a relatively fit and well young patient or perhaps, a reasonably short history at presentation.

CECT scans may aid diagnosis and the need for surgery⁶. They, however, do not always diagnose the small bowel herniating through the broad ligament of the uterus, as was the case for our patient, and this has been mirrored in similar reports.^{2,4,3}.

The CECT scan in our case report, in addition to other findings, showed faecalisation of the small bowel. We wondered if there was a bit of chronicity to this, given the similar presentation by the patient 5 months prior, which had resolved with non-operative management.

In cases with equivocal CT findings and a clinically unwell patient, diagnostic laparoscopy is a reasonable option⁸. This should be done in appropriately consented patients for diagnosis and treatment, as was the case with our patient.

Early diagnosis and timely treatment ensure the best outcomes for patients, while bearing in mind the attendant risks of surgery and anaesthesia with a negative laparoscopy. However, in these cases, the benefit of diagnostic laparoscopy significantly outweighs its risks, especially in fit and young patients.

Open and minimally invasive management options have been described for broad ligament hernias^{6,7,4,3}.

However, more extended hospital stays have been reported in patients managed with laparotomy compared to minimally invasive options. Nozoe et al. report a 10-day postoperative hospital stay for laparotomy, whereas Toolabi et al. report a 2-day postoperative hospital stay for laparoscopic management. Similar to Toolabi et al, our patient had a 2-day postoperative stay after laparoscopic management of the BLH^{3,2}.

Reyes et al, who had converted their laparoscopy to laparotomy due to safety concerns and poor access with distended bowel, report a 4-day hospital stay post-operation.

Laparoscopic management of broad ligament hernias requires advanced skills in laparoscopic surgery of intracorporeal suturing. The defect causing the

hernia must be closed surgically to prevent recurrence of bowel obstruction⁶.

In the absence of this laparoscopic skillset, then a laparotomy to manage broad ligament internal hernia and closure of the hernia defect is advised.

Ahuja et al. suggest closing the defect with non-absorbable sutures may prevent the recurrence of the hernia⁶.

Reyes et al. performed a salpingo-oophorectomy to eliminate the defect entirely⁴.

In cases with evidence of ischemic viscera needing resection, an emergency laparotomy is the preferred option^{7,4}. Regardless of the preferred approach, the defect in the broad ligament should not be left open on reduction of the hernia content. The main limitation of this report is the absence of operative images. This was not possible due to a lack of facilities for intra-operative image capture with the laparoscopic stack used for this operation. It is unethical in our institution to take photographs of intra-operative procedures using mobile phones.

Conclusion

Broad ligament hernias should be considered in females presenting with suprapubic pain and CECT findings of bowel obstruction of uncertain aetiology. Diagnostic laparoscopy is a validated diagnostic and treatment tool in these cases.

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Conflict of interest

None

Ethical approval

The patient's consent was sought for this work.

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Survey of Medical Students' Opinions Regarding their Training in the Discipline of Infectious Diseases

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Abstract:

Introduction: Infectious diseases occupy a central role in medical education, bridging multiple clinical disciplines. Effective teaching methods in this field are crucial for developing competent future physicians.

Aim: This study evaluated the satisfaction of fifth- and sixth-year medical students at the Faculty of Medicine, Trakia University, Stara Zagora, with current teaching methods in Infectious Diseases.

Materials and Methods: A total of 202 students completed a 25-item electronic questionnaire assessing attitudes toward classical and modern teaching approaches. Data were analysed using descriptive statistics.

Results: Most respondents (94.1%) found the subject interesting, and 69.3% regularly attended lectures. Although 97.5% approved of traditional didactic teaching, students favored greater interactivity. Educational games and role-based simulations were positively rated by 78.7%, while 90.1% supported short quizzes or discussions after lectures to improve retention.

Conclusion: Students expressed strong interest in the discipline and high satisfaction with teaching quality but emphasized the need for more active, visually enriched, and case-based learning methods to enhance engagement and long-term understanding.

Key Words:

Infectious Diseases, Game Teaching Methods

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Infectious diseases are an important part of medical science. Placed at the crossroads between many other specialties, they compile clinical presentations of pathology from internal medicine, pediatrics, neurology, intensive care, dermatology, epidemiology, clinical laboratory and microbiology. The constant emergence of new and resurgence of old infectious diseases keeps the relevance of this discipline at a high level. Infectious diseases as a subject in the educational system of medical students in higher education institutions are studied in the fifth and sixth year. In the fifth year, trainees have practical exercises in a hospital environment at the bedside and a theoretical lecture course. Their knowledge is tested by a practical and theoretical semester examination. In the sixth year, students undertake practical placement in a clinical setting, culminating in a state examination. The way in which medicine is taught during the training process is key to the successful practice of future medics. Existing classical methods of theoretical teaching in Medicine include:

1. Didactic lectures, also called "Socratic" lectures, are the gold standard and most common method in traditional teaching and

learning practice. This method depends on the qualities of the habilitated person who teaches a large amount of information with minimal student involvement¹.

2. Evidence-based medicine (EBM) provides students with the tools needed to study, understand, and evaluate the medical literature. EBM promotes focused thinking and the formation of long-term memory and, by allowing judicious application of available medical evidence in making decisions about patient care².
3. Case-based learning. Students are given the opportunity to examine real cases where actual contact with the patient, patient history, signs, symptoms along with clinical and laboratory findings are provided. Challa KT, et al. consider that medical education must be flexible enough to accommodate and incorporate multidisciplinary learning models effectively and appropriately at the right time and context, starting from the preclinical years³.

Modern techniques of teaching and learning in medical education provide opportunities for

collaborative learning, promoting effective communication and teamwork among future health professionals³. They include:

1. Simulation-based method. It allows students to cultivate their practical clinical skills in a controlled environment where realistic scenarios are enacted, recreating real-life situations. It develops their abilities to put their theoretical knowledge into real actions, make quick decisions, and work in teams⁴.
2. Flipped classroom involves prior preparation of students on the topic at hand, with discussion, discussion of practical cases, and expression of opinions during the lecture, suggesting higher-order reasoning⁵.
3. Problem-based learning. This is a test-based approach that encourages students to actively explore clinical problems and apply knowledge to solve them. It promotes independent learning, critical thinking, and problem-solving skills⁶.
4. Digital platforms and e-learning. Modern computing capabilities provide flexibility, accessibility and the ability to integrate multimedia elements that enhance engagement and knowledge retention based on quality assured digital resources⁷.

The aim of the present study was to determine the satisfaction of medical students in the 5th and 6th year of the Faculty of Medicine, Trakia University, Stara Zagora with the way their training in the discipline of Infectious diseases is conducted. Summarizing the responses to a survey administered for this purpose aims to identify key patterns, insights, and potential areas for improvement in both teaching methods.

Materials and Methods: A total of 202 students from the Faculty of Medicine of the Thracian University, Stara Zagora, participated in the study, which was conducted in 2025. For this purpose, a 25-question survey was developed and provided electronically to all participants. Their responses were evaluated using the methods of descriptive statistics with the statistical program SPSS, v.23.

Results: 94.1% of the students surveyed found the Infectious diseases course interesting. 2/3 of them attend the lectures regularly - 69.3%. However,

attendance at lectures is not compulsory, which is why, especially recently, academics often give presentations in half-empty academic halls. When asked why they do not come to listen to the Infectious Diseases lectures, students reply that they are scheduled in an inconvenient afternoon hour, at which time they already feel very tired. 1.48% find the Infectious Diseases lectures boring, 26.4% - almost 1/3 - report that they are prevented because they are working and the lectures coincide with their work schedule, or that they are engaged in a free elective class at the same time. 97.5% of the respondents like the classical model of theoretical teaching, but in fact they do not know any other. Classical lectures, lasting two hours or 90 minutes, are associated with the presentation of a large amount of information, although illustrated with multimedia cause a drop in attention and loss of interest after the first 30 minutes. Students are stationary and only listen, they have no options to actively participate, to show knowledge, opinions and attitudes. They appreciated the high quality of the infectious diseases lectures, but noted that the volume and density of material presented made retention of information challenging. 2.97% of respondents expressed a preference for interactive questions during the lecture, indicating that it would better encourage their attention and participation in the learning material.

Whether to have a test at the end of each lecture received an affirmative response from 90.1% of the students. They thought that it would help to activate their attention during the lecture and contribute to the consolidation of their knowledge. The others expressed concern that frequent quizzes might be an unnecessary pressure, suggesting instead interactive discussions as less stressful but equally effective alternative for verifying perceived information.

The classical method of teaching through oral lectures was rated good⁴ to excellent⁶ by 87.6% of the students. The étude games we use in the course of theoretical training in infectious diseases appeals to 78.7% of the students and is perceived by 78.2% of them as useful in enhancing the quality of their input and overall attentional engagement in the course of learning. Figure 1.

No	Question	Yes %	No %	No	Question	Yes %	No %
1.	Are you interested in the subject Infectious Diseases?	94,1	5,9	14.	Do you think pre-assigning roles for the next lecture would be better?	65,3	34,7
2.	Do you regularly attend lectures on Infectious Diseases?	69,3	30,7	15.	Why?	X	X
3.	If your answer is no, please explain why?	X	X	16.	Do you like your academic lecturer in Infectious Diseases?	80,7	19,3
4.	Do you like the classical method of teaching?	97,5	2,5	17.	Do you have any recommendations for your academic lecturer?	X	X
5.	How would you rate the classical method of teaching through oral lectures from 1 to 6?	?	?	18.	Do you like your assistant in Infectious Diseases?	72,3	27,7
6.	Do you find it appropriate to conduct a test after the end of each lecture?	90,1	9,9	19.	Do you have any recommendations for your assistant in Infectious Diseases? Please fill them in free text!	X	X
7.	Please motivate your answer to the above question!	X	X	20.	Do you like the discipline Infectious Diseases?	90,1	9,9
8.	Do you like the teaching method based on a study game?	78,7	21,3	21.	Are you afraid that you might get infected with an infectious disease during your studies?	56,9	43,1
9.	How would you rate from 1 to 6 the teaching method based on a game-based study?	?	?	22.	Which infectious disease scares you the most?	X	Z
10.	Do you think that the teaching method based on a game-based study enriches you?	78,2	21,8	23.	Would you like to specialize in Infectious Diseases?	11,4	88,6
11.	Do you remember the main points of the lecture more easily because of the use of a game-based study on the topic of the lecture?	80,7	19,3	24.	Please motivate your last answer!	X	X
12.	Have you participated in a sketch étude games?	59,4	40,6	25.	What would you suggest to make Infectious Diseases lectures more interesting and engaging, informative and entertaining?	X	X
13.	Would you like to participate in a sketch game?	61,9	38,9				

Table 1: Questionnaire on students' opinion about the teaching process in infectious diseases in relation to their medical education. Answers with an X indicate a free text response.

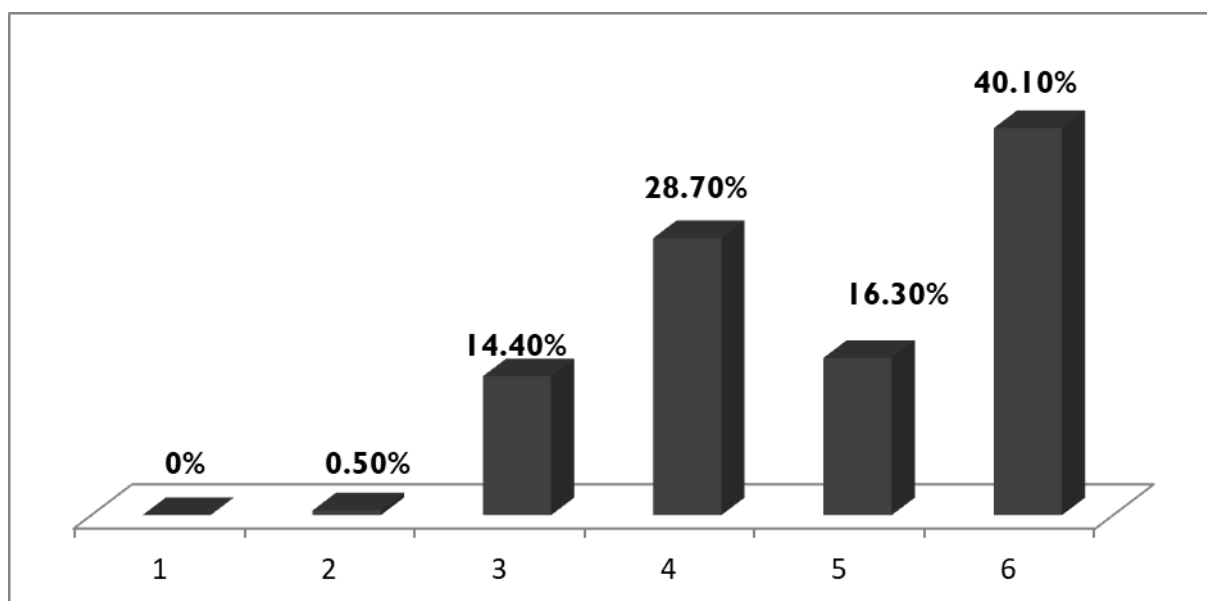


Figure 1: Students'evaluation of the etude games from 1 to 6

Most 65.3% prefer to have pre-set engagements so that they can develop their presentation in more detail and at ease.

Of the respondents, 80.7% like their academic lecturer, the same answer was given by 72.3% for

the ways to protect themselves from possible infection during their practical contact with patients. Fear of possible infection with an infectious disease during their training was expressed by 56.9% of the students. These concerns reflect an awareness of the occupational risks inherent in clinical training,

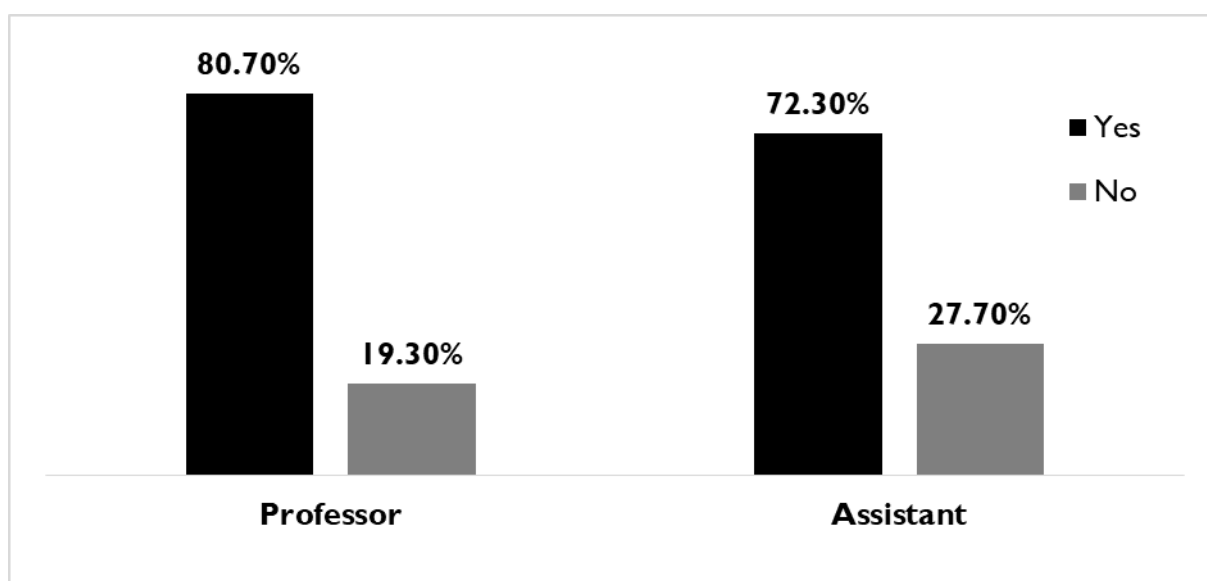


Figure 2: Answers to the question: Do students like their teachers?

their assistant professor. **Figure 2.**

Unfortunately, few of them expressed any recommendation - one would like their assistant not to repeat the lecture, but to show them more practical cases. Always at the beginning of the infectious diseases training students are explained

especially in settings prone to exposure. Among those expressing concern, the most frequently mentioned diseases included tuberculosis (TB), human immunodeficiency virus (HIV), Q fever, scarlet fever, rabies, and various unspecified viral infections. When asked if they would specialize in infectious diseases, most students gave a negative

answer. Their motivation is that they have another specialty in mind, which they are targeting, and they say most often that these are cardiology, endocrinology and AG. They are probably influenced by personal interests and career goals. 11.4% responded "YES", and they in turn indicated that this desire was based on the increasing importance of this topic of medicine in relation to infections arising from global travel, increasing antibiotic resistance, and the challenge of testing in extreme conditions. To prepare for the exams, students indicated that they will use available textbooks, lecture notes, online resources, and attendance at practical sessions. As part of the learning strategy, peer group collaboration was mentioned for students to review key topics to reinforce understanding and bridge knowledge gaps. These responses suggest that learners take a proactive and multifaceted approach to preparing for examinations, using a variety of learning sources to ensure their success. Students were asked to suggest ways in which infectious disease lectures could be made more engaging, informative and fun.

The responses reflect a wide range of preferences, but they can be grouped into a few general recommendations:

1. Increased use of clinical cases and real-life examples.
2. Interactive learning tools.
3. Visual aids such as images, videos and visual representations of disease progression.
4. Discussion-based instruction on didactic reading. Students expressed a preference for lectures to have a more conversational or discussion format.
5. Incorporate case narratives and humour. Most students state that they are satisfied with the current format of the lectures, describing them as "informative" and "good".
6. Satisfaction with the current format.
7. Concerns about role-playing activities One student pointed out that the use of role-playing games during lectures causes anxiety when attending lectures. In conclusion feedback shows a strong preference for active, visually enriched and clinically oriented learning sessions. Responses indicate that students benefit most from interactive, discussion-based lectures based on real-life clinical cases.

Discussion: The lecture material offers students a historical look at the past, when devastating pandemics claimed many lives, while at the same time showing them the modern picture of the spread of infectious diseases. The dramatic course of the clinical course of infectious diseases allows the theater of their imagination to build a picture of the reality of the pathology.

According to the Regulations of the Thrakia University, concerning the obligations of students in training, medical students must regularly attend the classes provided in the curriculum and complete all assigned tasks, course projects and practical classes on time⁸. However, attendance at lectures is not compulsory, which is why, especially recently, academics often give presentations in half-empty academic halls. Medical education in the higher education institutions of the Republic of Bulgaria is only full-time, which means that students have a continuous cycle of study, which excludes the possibility of being absentees and organising their own time to attend both theoretical and practical classes. For the classes missed due to the alternation with the epidemiology classes, they have the chance to make up their absences by arrangement with the teaching assistant. Usually this is done at the expense of the latter's free time or when he/she is engaged in schedule duty. In both cases, this absence causes considerable inconvenience, given that the lecturer receives no additional remuneration for these extra hours. In our opinion, the lack of adequate supervision and control over attendance is the cause of this inadequate behaviour. Chang SL et al point out that while early studies used classical compartmental modeling with self-learning games, in recent years there has been a significant growth of network-based modeling with imitation games and game-based learning theory is an effective tool for modeling decision making⁹. Lecturers need to be aware of the needs of learners and devise additional activities to the learning process to meet these needs with an emphasis on motivation. Building a motivational atmosphere, professional growth and cognitive benefit. Undoubtedly, the implementation of modern training methods will facilitate the acquisition of knowledge and skills.

Case-based learning is used extensively in the acquisition of practical knowledge and skills by 5th year medical students during their practicals as well as their state infectious disease clerkship. They develop their good communication skills to take a history, become accustomed to using the methods of objective examination, reflect on diagnosis and differential diagnosis, and express opinions on therapeutic approaches. The inconvenience arises from the reluctance of some patients to cooperate, despite having signed an informed consent to the contrary on admission to the clinic for treatment.

Given the rapidly evolving global landscape marked by increased international traffic on the one hand and the resurgence or emergence of new infectious diseases on the other, the need to update and adapt teaching content is continuous. This includes incorporating the latest developments in etiology,

clinical presentation, diagnosis and treatment approaches. An innovative addition to the teaching methodology is the use of étude games, a role-play format in which students assume specific roles and role-play clinical situations related to the lecture topics. This active learning strategy is designed to stimulate engagement, critical thinking and practical application of knowledge. Overall, feedback indicated a diversity of opinions regarding the methods of teaching the lecture material, with concerns largely focused on cognitive fatigue and stress, while suggestions were made aimed at promoting engagement through interactive teaching strategies. The étude games we use in the course of theoretical training in infectious diseases are related to role allocation involving bilateral engagement - as patients and as physicians.

We would point out that by the time they were surveyed, the students had already received training in nosological entities which they are afraid of, and should know that they cannot contract Q fever and rabies by talking to and physically coming into contact with patients with these diseases. In fact, students should take care of obtaining their own personal protective equipment such as masks, gloves and hand sanitizers as these are not provided by the training institution. In relation to these deficiencies in the provision of infection control resources potentially contributing to increased personal safety concerns, the need for enhanced infection prevention protocols and the provision of basic protective equipment of the type mentioned above to maintain both the physical safety and psychological well-being of medical students should be emphasized.

About the students' recommendations many students emphasized the value of including clinical case discussions, real-life scenarios of diagnostic problem-solving exercises with problem patients, and. These elements were seen as effective in linking theoretical content to practical application, thereby increasing engagement and retention. They gave the suggestions include the use of real-time quizzes, surveys, and short étude games during lectures to encourage active participation and sustain attention. They thought that visual aids such as images, videos and visual representations of disease progression were also referred to in order to make abstract concepts more tangible and memorable.

Students expressed a preference for lectures to have a more conversational or discussion format. Such passive delivery of information can lead to reduced concentration and engagement, especially

on long academic days. They suggested open discussions, guided explanations and self-presented parts of the lecture topic as more effective alternatives. Several respondents mentioned that storytelling, the use of patient narratives and even light humour could make lectures more enjoyable and improve focus and retention.

Although most students state that they are satisfied with the current format of the lectures, describing them as "informative" and "good", but minor improvements are still suggested, such as the use of selected YouTube videos to enrich the material and improve understanding.

Conclusions: Medical students enjoy the course "Infectious Diseases". Feedback shows a strong preference for active, visually enriched and clinically oriented learning sessions. Responses indicate that students benefit most from interactive, discussion-based and real-life clinical case-based lectures. They like the educational games, finding them useful for easier memorization of the material. What is needed is a skillful upgrade of the existing base by integrating new techniques to engage their attention and stimulate their long-term memory, as well as adequate readjustment of the teacher himself to these innovative methods. Feedback shows a strong preference for active, visually enriched and clinically oriented lessons. The responses show that students benefit most from interactive, discussion-based and real-life clinical case-based lectures.

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A Comparison between Primary and Secondary Breast Angiosarcoma: Our Local Experience

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Abstract:

Breast angiosarcoma is a rare form of cancer and can be classified into primary or secondary types. We report two cases of breast angiosarcoma in our locality, and illustrate the differences encountered between the two types. There is no standard treatment for this disease. Surgery is the mainstay of treatment, but the role of adjuvant treatment remains uncertain.

Key Words:

Breast Angiosarcoma, Surgery, Case Report

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Introduction

Angiosarcoma of the breast is a rare and highly aggressive cancer, accounting for only 0.04% of all breast malignancy¹. It can occur as a primary lesion of the breast or as a secondary lesion after breast irradiation or in patients with chronic lymphedema after axillary dissection (Stewart - Treves syndrome). Diagnosis is difficult and the prognosis is poor, with optimal adjuvant treatment based mainly on expert opinion due to the rarity of the condition². We report two cases in our locality and compare the differences encountered between primary and secondary disease.

Case I

Miss C is a 46-year-old lady, whose mother was diagnosed with breast cancer at age of 56, presented with progressive right breast engorgement and mastalgia in 2021. Physical examination revealed breast asymmetry with an 8cm firm mass over the upper outer quadrant of the right breast which was not fixed to the underlying muscle or overlying skin. The nipple areolar complex was not affected and there were no palpable axillary lymph nodes. Ultrasound and bilateral mammogram (figure 1) was performed which showed a large 7.9x 3.1 x 8.8cm irregular mass at the right upper outer quadrant with no suspicious microcalcification and no axillary lymphadenopathy bilaterally. Core biopsy of the lesion showed atypical vascular proliferation, most in keeping with well differentiated angiosarcoma. A whole-body positron emission tomography computed tomography (PET-CT) showed no distant metastasis. After discussion with

the multi-disciplinary team, Miss C underwent a right skin sparing mastectomy with transverse rectus abdominis myocutaneous (TRAM) flap reconstruction and sentinel lymph node biopsy. Pathology confirmed angiosarcoma with clear margins (most margins >2cm), and sentinel lymph node was negative for malignancy. Adjuvant radiotherapy was offered for improving local control based on retrospective series, but Miss C was not keen.

In December 2022, she presented with haemoptysis with ~5mL fresh blood with clots during each coughing episode. On examination, a discrete 2cm right upper jugular cervical lymph node was palpable, and a plain chest radiograph revealed a 18mm opacity over the left hilar region. Ultrasound -guided fine needle aspiration of the enlarged cervical lymph node showed atypical cells. Excisional biopsy of the lymph node was performed and the resulting pathological findings were consistent with metastatic angiosarcoma. Her PET-CT revealed multiple new hypermetabolic bilateral lung nodules with adjacent ground glass densities which were suggestive of haemorrhagic metastasis of angiosarcoma. Within a month of her recurrence, she also developed multiple scalp, gum and skin nodules (figure 2) with occasional bleeding. She was started on palliative chemotherapy, initially with paclitaxel which was later changed to adriamycin and zometa after she developed bone and liver metastasis. She then developed brain metastasis for which she was given radiotherapy (figure 3).

Case 2

In comparison, Madam S is a 76-year old lady with a right breast ductal carcinoma in situ in 2010, for which she underwent a right sided breast-conserving therapy, sentinel lymph node biopsy with adjuvant radiotherapy. In 2014, she had a screen-detected lesion for which she underwent left sided breast-conserving therapy and sentinel lymph node biopsy (pT1cN0 ER/PR+ invasive ductal carcinoma, margins clear) with subsequent radiotherapy and hormonal treatment. Post treatment she has been kept on regular surveillance with no recurrence seen on her latest mammogram and ultrasound in January 2021.

Other significant medical history include papillary thyroid cancer, for which she received a total thyroidectomy and adjuvant radioactive iodine therapy.

In November 2022, Madam S presented with a left breast nodule with associated pain and bleeding. Clinically there was a 1x1cm round nodule at the left 5 o'clock region, 2cm from the nipple with easy contact bleeding. Physical examination revealed no other suspicious breast lump or palpable axillary lymphadenopathy. There was also no lymphoedema. The working diagnosis at the time was a bleeding pyogenic granuloma. In view of the persistent troublesome bleeding and history of bilateral breast cancer, the lesion was excised under local anaesthetic. The pathology was consistent with moderately differentiated angiosarcoma with the close margins (closest 1mm). A PET-CT was performed which showed only the hypermetabolic skin lesion over the left breast related to excisional biopsy (figure 4), with no nodal or distant metastasis. Madam S later underwent wide local excision with no axillary treatment in private in January 2023. The pathology showed no residual tumour. No adjuvant therapy for her breast angiosarcoma was required, and there was no evidence of recurrence at her latest follow up with oncology.

Discussion

Angiosarcoma of the breast is extremely rare and can be divided into the de-novo (primary) or therapy-related (secondary) form. Primary breast angiosarcoma usually occurs between females between 20-50 years of age^{3,4,5}, whilst secondary breast angiosarcoma is typically seen in older women, with the mean age of 70⁶. Secondary cases occur following a latent period after radiation or in patients with chronic lymphedema after axillary dissection (Stewart - Treves syndrome). In contrast, there are no known risk factors for the primary form. High grade breast angiosarcomas are associated with a poor prognosis, tend to

metastasize early, often to the lungs or liver and have a 5-year survival rate of only 15%⁷. Low grade and intermediate grade tumours fare better in some studies⁷, however according to Nasciemento et al, there is no correlation between histologic grade and patient outcome in their review of 49 cases⁸.

Patients with breast angiosarcoma can present with diffuse breast enlargement or a rapidly growing palpable breast mass which may have a tinge of purple discolouration, due to its highly vascular nature. Diagnosing breast angiosarcoma can be difficult as the radiological findings are non-specific. Tumours may appear hypoechoic, hyperechoic or heterogeneous on ultrasound, with high vascularity⁹. Mammographically, breast angiosarcomas can appear as large dense homogenous mass with no calcifications or spiculations⁹ and up to 33% of the tumours can have normal mammogram findings¹⁰. Magnetic resonance imaging (MRI) or computed tomography (CT) with contrast can help confirm the hypervascular nature of these lesions. Primary angiosarcomas are often located deep in the breast parenchyma¹¹ hence pathological confirmation with core biopsy may have false negative rates of up to 40% of cases¹².

Currently there is no standard treatment for breast angiosarcoma in view of the small number of reported cases. Surgical resection with negative margins is typically performed, with preference for mastectomy over wide local excision due to lower estimated recurrence rate (8% vs 23% respectively)¹³. Axillary dissection is usually not required as lymph node involvement is uncommon (<5% of cases)¹⁴. Ragavan et al 2020 performed a retrospective review between 2006 and 2019 on axillary lymph node dissection in breast angiosarcoma patients in Singapore with no positive lymph node metastasis detected in their cohort of thirteen cases¹⁵. The role of chemotherapy and radiotherapy in breast angiosarcomas is not well established. For primary breast angiosarcoma, adjuvant radiotherapy after surgery allows for better local control with lower recurrence rate according to Johnstone et al.¹⁶ but the overall survival rate was comparable with those without radiotherapy¹⁷. The role of adjuvant chemotherapy is undefined at present, being based mainly on adult soft tissue sarcomas. Current literature suggests that patients with large high grade angiosarcoma or recurrence may benefit from chemotherapy¹⁸ as these subset of patients have a poor prognosis. Anti-angiogenic and immunological therapies have also been described, but to date have had disappointing results¹⁹.

Conclusion

In conclusion, we report two cases of breast angiosarcoma in our locality. Given the aggressive

nature of the disease, early detection and prompt surgical treatment are needed. Further studies are needed to guide adjuvant treatment modalities and their survival benefit. In addition, it is still unclear whether treatment for primary vs secondary angiosarcomas differ given the rarity of the disease.

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Evaluating Medical Students', Clinicians', and the Public's Perspectives on the Integration of Medical Associate Professionals (MAPs) into the NHS

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Abstract:

This study critically evaluates the perceptions of medical students, junior doctors, consultants, and the public on the integration of Medical Associate Professionals (MAPs) into the United Kingdom's National Health Service (NHS). MAPs, encompassing physician associates, anaesthesia associates, and surgical care practitioners, have been introduced to mitigate workforce shortages and enhance service provision. However, apprehensions persist about their abbreviated training pathways, implications on patient safety, and potential disruption to the professional development of doctors in training.

A structured questionnaire was completed by 387 respondents (54 medical students; 114 junior doctors; 171 consultants; 48 members of the public). Employing both quantitative and qualitative methodologies to analyse these responses, the study elucidates attitudes towards MAPs' clinical roles and the possible impact on the provision of healthcare. Findings revealed reservations amongst medical trainees about diminished training opportunities and professional progression. While consultants acknowledged MAPs' helpfulness in procedural support, they voiced concerns about supervision, long-term sustainability and impact on training. The public demonstrated limited awareness of the role of MAPs and expressed scepticism towards their equivalence to qualified doctors.

These findings underscore the necessity for comprehensive regulatory frameworks, explicit role delineation, and transparent governance to safeguard patient welfare. Future policies must balance workforce expansion with the preservation of educational rigour and professional standards, ensuring sustainable integration of MAPs within the NHS.

Key Words:

Medical Associate Professionals; NHS Workforce; Patient Safety; Healthcare Regulation; Clinical Training

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Introduction

The United Kingdom (UK) is currently facing a significant shortage of doctors, with an average of 2.9 doctors per 1,000 people in England compared to an average of 3.7 in other economically-developed European countries¹. This has led to over 7,750 vacant medical positions¹, which arguably negatively affects the quality of patient care. Additionally, persistent vacancies add to stress, burnout, and fatigue amongst healthcare workers, further straining healthcare services across the country¹.

In an attempt to address these challenges, the National Health Service (NHS) introduced medical associate professionals (MAPs)², which include three distinct groups of mid-level practitioners: physician associates (PAs), anaesthesia associates (AAs), and surgical care practitioners (SCPs). PAs were the first to be introduced in 2003². MAPs' roles and responsibilities have changed over time, sparking both agreement and debate amongst qualified

doctors. While early doubts have given way to some optimism, discussions continue about whether MAPs can effectively and efficiently fill gaps in healthcare provision². In December 2024, the General Medical Council (GMC) agreed to regulate MAPs³. Doctors, as well as members of the public, have raised concerns about patient safety and healthcare quality, particularly if MAPs are to be considered substitutes for fully-qualified doctors^{4,8}.

These surveys have highlighted the necessity for clear rules and guidance. Suggestions include independent reviews of the roles of MAPs, discussions amongst professional bodies, assessments of economic risks such as legal claims and hospital re-admissions, and strong standards for clinical practice⁹. Other proposals involve protecting doctors' training, clarifying prescribing rights, defining legal responsibilities, and reconsidering job titles⁹. Since these issues ultimately affect patient care, it is essential to consider the thoughts of those directly impacted, namely healthcare professionals

and the public.

As part of its long-term workforce plan, the NHS in England has proposed increasing the number of PAs by over 200% by 2037, raising the total to around 10,000². While this could help reduce the current shortage of doctors, apprehensions emerge about the extent to which a two-year postgraduate training programme for MAPs can adequately replace the extensive education and experience that doctors must undertake over a period of several years².

This study examines the views of medical students, healthcare professionals, and members of the public on the broader integration of MAPs into clinical practice, with a particular focus on patient safety. It follows concerning reports published by organisations such as the British Medical Association (BMA)⁴, as well as investigations featured in news outlets including *The Guardian*⁵⁻⁶, *The Telegraph*¹⁰, and *ITV News*¹¹. These reports and articles have highlighted potential risks and challenges associated with expanding the role of MAPs in clinical settings. By gathering responses from medical students, junior doctors, consultants, and the public, this study aims to provide comprehensive insights into this topical and significant issue from the perspectives of those directly impacted.

Methods

This multi-perspective study employed a structured electronic questionnaire to elicit both quantitative and qualitative data to evaluate perspectives of the integration of MAPs within the NHS framework (Appendix I). The questionnaire was developed by a panel of educators and clinicians to ensure relevance to the key concerns discussed in the current literature. These included apprehensions amongst medical students about the potential impact of an increased MAP workforce on career trajectories and training opportunities, perceived benefits and limitations for routine training and learning experiences of junior doctors, consultants' perceptions of MAPs' contributions to clinical workflow, patient care and safety, and levels of confidence amongst the public in receiving care administered by MAPs in clinics, wards and theatres.

A convenience sampling approach was first used to distribute the electronic questionnaire to medical students, junior doctors, consultants, and members of the public to whom the authors had access. The snowball sampling method was then employed to increase the number of responses. Medical students in any year group and from any UK Medical School, junior doctors and consultants with any level of experience and of any surgical specialty working in the NHS, and members of the UK public were invited to participate. Responses were collected

between January 2024 and August 2024.

The responses were submitted anonymously via a secure online link and subsequently reviewed and analysed by the authors. IBM SPSS (Version 26) was used to statistically evaluate the quantitative data through descriptive methods, while the qualitative responses underwent manual content analysis. The data repository maintained stringent anonymity protocols to ensure confidentiality of respondents. Ethical approval was obtained from Doctors Academy's Academic Research Ethics Committee under reference number 202312-8KB.

Results

This study encompassed a cohort of 387 respondents, comprising 54 medical students, 114 junior doctors, 171 consultants, and 48 members of the public. Since distinct queries were posed to each subgroup to explore individualised perspectives, the responses of each subgroup are presented separately in this section.

A. Medical Students' Perspectives on the Integration of MAPs

Of the medical students surveyed, 93% (n=50) articulated a discernible apprehension towards the potential detriment to their training prospects (Figure 1). They expressed concerns regarding the preferential recruitment of locally-employed MAPs over rotational medical staff and encroachment upon doctors' professional domains (Table 1).

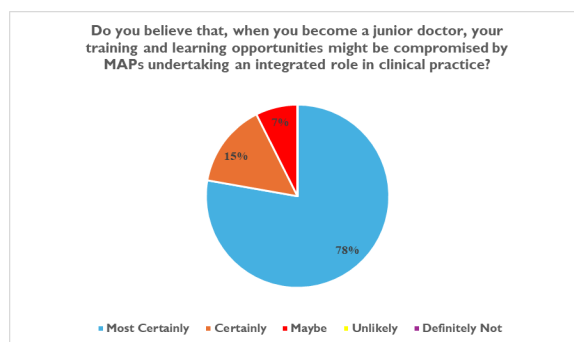


Figure 1: Responses from Medical Students (n=54) to Question 2a

Do you believe that, when you become a junior doctor, your training and learning opportunities might be compromised by MAPs undertaking an integrated role in clinical practice?

- "Limited training seats"
- "As locally employed, MAPs will be preferred over rotational doctors"
- "No clear guidelines on exact roles, encroaching on doctors' territory"

Table 1: Responses from Medical Students (n=54) to Question 2b

Has the increased recruitment and expansion of MAPs into the NHS influenced your future career plans (e.g., your preferred specialty or your preferred place of work as a qualified doctor)?

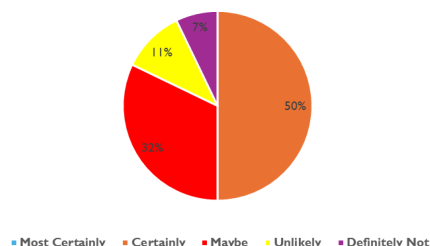


Figure 2: Responses from Medical Students (n=54) to Question 3a

Has the increased recruitment and expansion of MAPs into the NHS influenced your future career plans (e.g., your preferred specialty or your preferred place of work as a qualified doctor)?

- “Whether medical students will find work in the future”
- “Junior doctors paid less than MAPs”

Table 2: Responses from Medical Students (n=54) to Question 3b

The induction of MAPs into the NHS was perceived to exert an influence on medical students’ career decisions: 74% (n=40) of respondents anticipated an unequivocal impact on their future professional choices, including specialty selection and geographical location. Amongst the remainder, 16% (n=9) posited the plausibility of such an impact, whereas 10% (n=5) deemed any resultant impact improbable (**Figure 2**). Apprehensions around whether they would secure employment as doctors were expressed (**Table 2**).

Fifty-six percent (n=30) of medical students surveyed did not believe that MAPs could help to mitigate challenges within the NHS (**Figure 3**). The principal reservations expressed pertained to deficiencies in MAPs’ training and the consequent compromise of patient safety (**Table 3**). Conversely, 32% (n=17) indicated the possibility of a

Do you believe that MAPs, such as Physician Associates, Anaesthesia Associates and Surgical Care Practitioners, can help to alleviate the issues that the NHS currently faces?

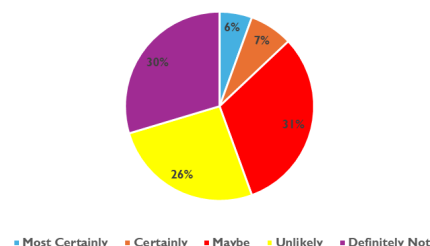


Figure 3: Responses from Medical Students (n=54) to Question 1a

role for MAPs to alleviate such issues, whilst only 13% (n=7) asserted their definitive utility in this context (**Figure 3**). These respondents contended that the deployment of MAPs could serve as interim remedies for deeper systemic deficiencies, dependent upon judicious implementation (**Table 3**).

B. Junior Doctors’ Perspectives on the

Do you believe that Medical Associate Professionals (MAPs), such as Physician Associates, Anaesthesia Associates and Surgical Care Practitioners can help to alleviate the issues that the NHS currently faces (e.g., high waiting times; spiralling costs; high burnout rates; low morale of doctors)?

- “As long as they practice within their scope”
- “Can free up training time for doctors”
- “Can perform repetitive time-consuming tasks”
- “As long as training not hindered”
- “If utilised appropriately”
- “Temporary fix”
- “Take opportunities away from future consultants”
- “Confusing to patients”
- “Lack of training, experience”
- “Patient safety”

Table 3: Responses from Medical Students (n=54) to Question 1b

Do you believe that Medical Associate Professionals (MAPs), such as Physician Associates, Anaesthesia Associates and Surgical Care Practitioners, can help to alleviate the issues that the NHS currently faces?

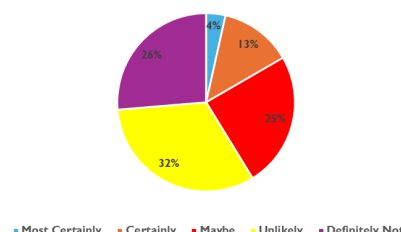


Figure 4: Responses from Junior Doctors (n=114) to Question 3a

Level	Number
Clinical Fellow	9
Clinical Teaching Fellow	1
Core Trainee	22
Foundation Year Doctors 1-4	18
Specialty Trainee 3-5	33
Specialty Trainee 6-8	8
Specialty Doctor	8
Trust Grade Doctor	13
Other	2

Table 4: Levels of Training of Junior Doctor Respondents (n=114)

Integration of MAPs

The 114 junior doctors surveyed represented a variety of grades and specialities (Table 4 and Table 5). More than half (59%; n=67) felt that MAPs would be unable to help alleviate the pressures faced by the NHS, but 16% (n=19) believed the inverse (Figure 4). The concerns focused on the need for more doctors rather than MAPs and doubts about MAPs' ability to handle medico-legal issues (Table 6). However, some respondents suggested that MAPs could assume a useful role in the mitigation of these issues if they worked under the supervision of and alongside doctors (Table 6).

Specialty	Number
Accident and Emergency	2
Anaesthesia/Intensive Care	3
General Practice	3
Histopathology	1
Medicine	10
Surgery	84
Ophthalmology	1
Trauma and Orthopaedics	2
Paediatrics	3
Radiology	3
Other	2

Table 5: Responses from Medical Students (n=54) to Question 1b



Figure 5: Responses from Junior Doctors (n=114) to Question 6a

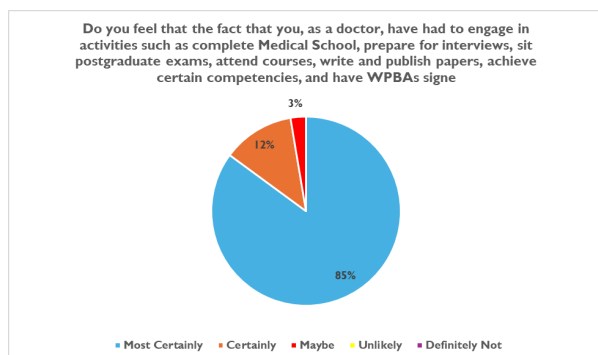


Figure 6: Responses from Junior Doctors (n=114) to Question 4a

Do you believe that Medical Associate Professionals (MAPs), such as Physician Associates, Anaesthesia Associates and Surgical Care Practitioners, can help to alleviate the issues that the NHS currently faces (e.g., high waiting times; spiralling costs; high burnout rates; low morale of doctors)?

- "Role in working alongside doctors"
- "Need clear roles and duties"
- "Could be an intermediary"
- "Service provision with supervision, not to act unsupervised in clinics"
- "Will increase overall workload"
- "Lack of expertise"
- "Decreased quality of services"
- "Higher risks to patients"
- "Less efficiency"
- "Lack of understanding medicolegal issues"
- "Add to workload"
- "We need more doctors not MAPs"

Table 6: Responses from Junior Doctors (n=114) to Question 3b

Almost all (97%; n=111) the junior doctors surveyed felt that the hard work they must endure to keep up with the arduous and competitive process to become a doctor became undervalued when learning opportunities were given to MAPs instead of to them (Figure 5). One respondent questioned if the effort to become a doctor was truly worth it, whilst another contemplated whether the challenges faced to become a doctor are adequately considered in debates about MAPs (Table 7). Respondents similarly expressed concerns about their training opportunities; 90% (n=103) believed that MAPs will negatively affect their access to training (Figure 6). Two comments alluded to the already high competition amongst

Do you feel that the fact that you, as a doctor, have had to engage in activities such as complete Medical School, prepare for interviews, sit postgraduate exams, attend courses, write and publish papers, achieve certain competencies, and have WPBAs signed off is sometimes undervalued when a learning opportunity is offered to a MAP?

- "Much higher efforts needed from doctors"
- "Why would anyone become a doctor?"
- "By-passing exams and gaining equivalence"
- "Increase competition"
- "Are these factors ever looked at by people who encourage MAPs?"

Table 7: Responses from Junior Doctors (n=114) to Question 4b

trainees for positions in training programmes (Table 8). Additionally, 50% (n=57) maintained that the continued expansion of MAPs will influence their future career plans (Figure 7).

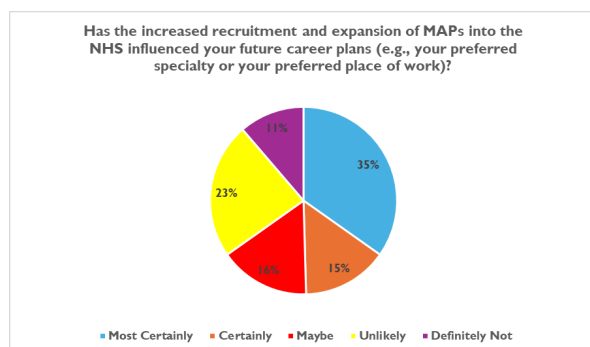


Figure 7: Responses from Junior Doctors (n=114) to Question 7

Do you believe that your training opportunities are or will be affected by MAPs undertaking a more integrated role in clinical practice?
• "No on-call commitments"
• "competes with 2 junior doctors"
• "Workforce is already saturated with trainees"
• "MAPs cannot run wards independently, need constant support"
• "Depends on attitude of department towards trainee-MAP functioning"

Table 8: Responses from Junior Doctors (n=114) to Question 6b

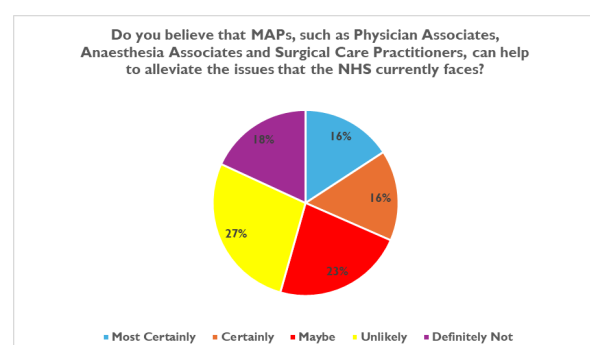


Figure 8: Responses from Consultants (n=171) to Question 1a

Consultants' Perspectives on the Integration of MAPs

Similarly to the medical students and junior doctors surveyed, consultants were asked whether they believed that MAPs can mitigate systemic challenges within the NHS. Of 171 respondents, 78 (46%) regarded this prospect as improbable, 39 (23%) acknowledged that it could be possible, and 54 (31%) affirmed the existence of a definable role (Figure 8). While proponents highlighted MAPs'

potential capacity to provide operational support in the absence of medical staff, to collate clinical data, and to assist in basic procedures, others expressed reservations regarding the burden of supervising MAPs and the ambiguous longevity of their roles within the NHS (Table 9).

Do you believe that Medical Associate Professionals (MAPs), such as Physician Associates, Anaesthesia Associates and Surgical Care Practitioners can help to alleviate the issues that the NHS currently faces (e.g., high waiting times; spiralling costs; high burnout rates; low morale of doctors)?

- "Support daily work in absence of doctors"
- "Can collate targeted information"
- "Can assist basic procedures"
- "Can do mundane tasks"
- "Should be involved after diagnosis made, not to be thrown in the deep end"
- "Can create more work"
- "Used to fill gaps"
- "Unsure of long-term role"

Table 9: Responses from Consultants (n=171) to Question 1b

Consultants' preferences for MAPs relative to junior doctors in clinical and surgical settings were explored. This question was answered by only 110 respondents, of which a substantial majority (81%; n=89) rejected the substitution of junior doctors with MAPs in these contexts (Figure 9; Table 10). The impact of an integrated role of MAPs on junior

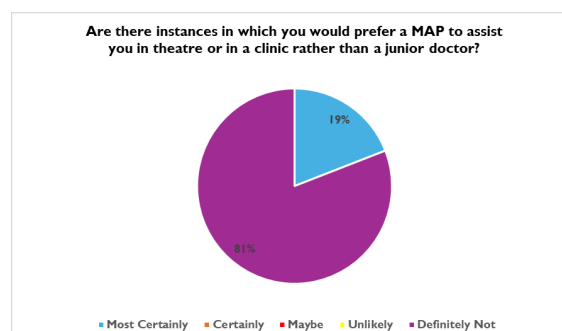


Figure 9: Responses from Consultants (n=110) to Question 2

doctors' training opportunities was also examined from the perspective of consultants; a significant majority of respondents (74%; n=127) anticipated an effect (Figure 10; Table 11). Additionally, 47 of 73 consultants (64%) conveyed apprehension that MAPs' long-term incorporation into clinical practice could compromise the transition of junior doctors to consultancy (Figure 11; Table 12).

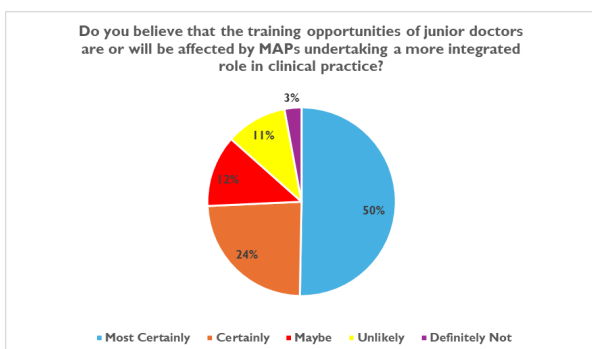


Figure 10: Responses from Consultants (n=171) to Question 3a

Are there instances in which you would prefer a MAP to assist you in theatre or in a clinic rather than a junior doctor?

- “Day-case proctology like procedures”
- “Ward rounds”
- “More knowledge in trainees”

Table 10: Responses from Consultants (n=110) to Question 2

Do you believe that the training opportunities of junior doctors are or will be affected by MAPs undertaking a more integrated role in clinical practice?

- “Limited opportunities”
- “MAPs not out of hours/ on-calls, thus training opportunities lost for trainees”

Table 11: Responses from Consultants (n=171) to Question 3b

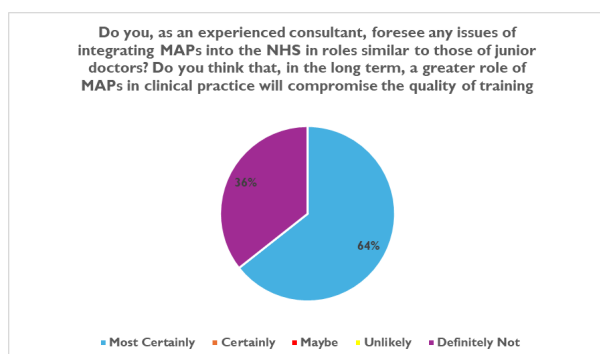


Figure 11: Responses from Consultants (n=73) to Question 4

Public's Perspectives on the Integration of MAPs

Among the 48 members of the public surveyed, awareness of MAPs was markedly low, with 39 (81%) unaware of their professional profiles (**Figure 12**). Comparable levels of awareness were observed when respondents were asked if they realised that

they might be treated by an MAP rather than a doctor in primary or secondary care settings; 40 respondents (83%) were unaware (**Figure 13**).

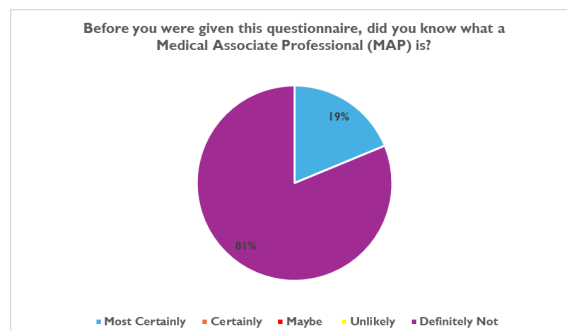


Figure 12: Responses from the Public (n=48) to Question 1

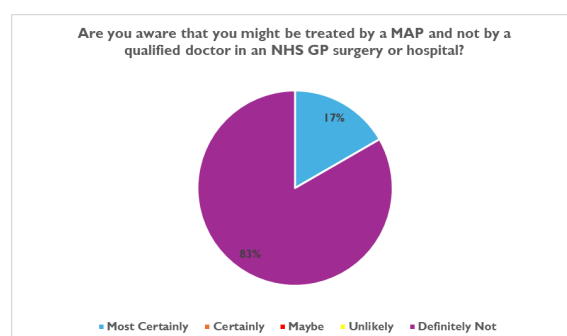


Figure 13: Responses from the Public (n=48) to Question 2

Do you, as an experienced consultant, foresee any issues of integrating MAPs into the NHS in roles similar to those of junior doctors? Do you think that, in the long term, a greater role of MAPs in clinical practice will compromise the quality of training of junior doctors who are training to become consultants?

- “The system needs to protect training”
- “Useful addition to the team”

Table 12: Responses from Consultants (n=73) to Question 4

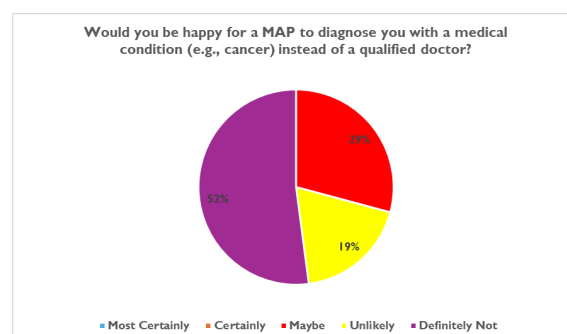


Figure 14: Responses from the Public (n=48) to Question 3

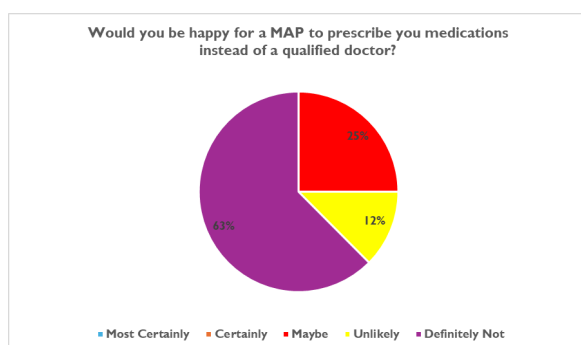


Figure 15: Responses from the Public (n=48) to Question 4

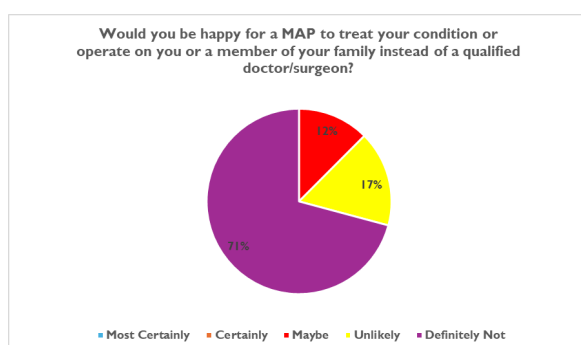


Figure 16: Responses from the Public (n=48) to Question 5

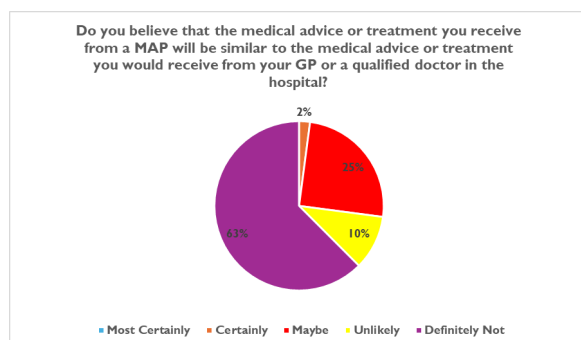


Figure 17: Responses from the Public (n=48) to Question 6

Attitudes towards diagnostic responsibilities undertaken by MAPs revealed notable scepticism: 34 (71%) respondents would not be content to receive a diagnosis from a MAP, and 14 (29%) might (Figure 14). However, no respondent would 'most certainly' or 'certainly' be satisfied to be diagnosed by a MAP. A similar trend emerged regarding prescribing practices, with 36 (75%) expressing discontent at the prospect of being prescribed medications by a MAP rather than a qualified doctor (Figure 15). The other 12 respondents (25%) suggested that they might be open to this, but no respondent conveyed certainty (Figure 15).

In regards to more invasive interventions, such as medical treatment or surgical procedures, resistance

Do you have any other thoughts about the expansion of MAPs in GP surgeries or NHS hospitals?

- I think it is a ridiculous idea and should not go ahead.
- As long as they have training in the specific field they are working in yes. But I will always prefer a doctor
- More information about their role and responsibilities needed before a decision could be made
- A sad state of affairs. NHS needs funding properly.
- It is to address the shortage of doctors, and offer medical services on the cheap and create a two tier health service. Soon rich people will get doctors and poor people will get MAPs to treat them.
- This is not something I feel should be done - it is undermining years of study and training.
- I won't allow a flight attendant to fly an aeroplane. Why won't I want a doctor to treat me? Is my health not important?
- Useless government policies will chase the doctors away.
- Won't allow them to come near me. I insist on seeing a doctor since I have paid my taxes all my life.
- Does airhostess fly an aeroplane?
- Pathetic from the government. People will die.
- MAPs are just assistants to doctors. They should not be allowed to treat patients in any form.
- This should be discouraged. There should be at least graduate doctor of treating any patients.
- Strongly opposed to this and will insist on seeing a qualified person.
- I don't like the idea.
- Not happy with this. is it another cost cutting scheme?
- It causes me a great deal of concern.
- Didn't know about this until now.
- Sad way to substitute [sic] a qualified doctor.
- Might lower waiting time. For certain areas but quality will be poor.

Table 13: Responses from Members of Public (n=48) to Question 7

intensified: 42 respondents (87%) were unequivocally opposed to medical or surgical treatment carried out by MAPs, whilst six (12.5%) conveyed tentative acceptance (Figure 16). No respondent stated that he/she would 'certainly' or 'most certainly' be content to receive medical or

surgical treatment from a MAP (**Figure 16**). Furthermore, confidence in the clinical equivalence between MAPs and doctors was limited, with only one respondent (2%) perceiving the quality of advice and treatment offered by the two groups comparable. Twelve respondents (25%) believed that there might be some parity, but a significant majority (87%; $n=42$) did not consider any comparability.

The members of the public were also invited to provide their thoughts on the expansion of MAPs in their General Practice surgery or local hospital. Twenty comments were received, all of which carried negative connotations and many of which were particularly striking (**Table 13**). Examples include “it causes me a deal of concern” and “[s]ad way to substitute a qualified doctor”.

Discussion

The findings of this study provide a critical examination of the integration of and functional roles assumed by MAPs within the NHS from the perspectives of medical students, clinicians, and the public. MAPs, categorised as PAs, AAs and SCPs, have defined roles within the core capabilities framework commissioned by Health Education England (HEE)¹². However, persistent ambiguities surrounding role boundaries relative to junior doctors have led to functional overlap across clinical environments, prompting debate on MAPs' appropriate scope of practice⁹. This study has explored certain elements that underpin this.

The potential of MAPs to fill workforce gaps and alleviate pressures on overstretched NHS services has been posited². However, a central issue raised in the literature is the disparity in education and training pathways between MAPs and junior doctors². MAPs complete a two-year postgraduate qualification during which they must obtain 1,600 clinical hours¹³, while doctors must spend five-to-six years in Medical School, achieve 5,500 clinical hours, and complete a foundation year to gain full registration¹⁴. This contrast inevitably raises concerns about patient safety and clinical autonomy, particularly since MAPs are trained to function in supportive capacities rather than as independent decision-makers. Unlike other allied specialties such as nursing, physiotherapy and occupational therapy, the supportive role of MAPs is, indeed, vaguely defined in most institutions as MAPs review patients independently on wards and in clinics, and they might even independently perform minor theatre procedures such as joint injections which doctors have traditionally been trained to perform. Unless clear distinctions are drawn and discrete roles are drafted for MAPs, concerns on the overlap of their duties compared to those normally undertaken by doctors will arise. These apprehensions have

emerged in our results, voiced throughout the different strata of the society questioned.

The integration of MAPs can be seen to threaten junior doctors' training opportunities. Indeed, over 90% of the medical students and junior doctors surveyed in this study expressed concerns that the presence of MAPs could erode their learning experiences. Additionally, almost all of the junior doctors reported that the substantial time, resources and effort that they must invest into their professional development felt undervalued when opportunities are given to MAPs. These findings support the BMA's call to safeguard doctors' training pathways and its proposal to rebrand MAPs as “assistants” in order to explicate that their role is purely supportive⁴. They also give strength to the suggestion that MAPs should be viewed as a support to junior doctors rather than a replacement¹⁵.

On the other hand, this study found that some senior clinicians welcome the integration of MAPs as a pragmatic response to workforce shortages in the NHS. Yet, while over 50% of the consultants surveyed acknowledged MAPs' potential to relieve clinical pressures, a significant majority expressed a preference for junior doctors in clinics and theatres, with many concerned about compromised training opportunities of junior doctors who will, in the near future, become consultants.

Despite the theoretical benefit that MAPs can improve service delivery, this study revealed that a significant minority of the public understood the role of MAPs. A preference for diagnoses, medications, and surgical interventions administered by doctors rather than MAPs was evident. These findings support a survey conducted by the BMA in 2023 which identified that 86% of 18,000 doctors noted that patients frequently cannot distinguish between doctors and MAPs and that 30% of 2,009 public respondents were unaware that MAPs existed⁴. This is further corroborated by a recent systematic review on the public's perception of MAPs, which concluded that many patients mistake PAs for doctors and are unaware of the prescribing rights of PAs¹⁶. Mesharck *et al.* similarly proposed that the role of MAPs within the NHS should be clearly outlined and communicated, particularly to the public, since misconceptions and insufficient information about the roles of MAPs exist¹⁷. NHS England mandates that patients must be informed when they communicate with a PA rather than a doctor¹⁸. However, inconsistent adherence to this directive has carried serious consequences¹⁹. Such evidence underscores the need for greater transparency within healthcare services, as well as education amongst the public, to clarify the identities and functional limitations of MAPs. Indeed, that the public has demonstrated some willingness

to visualise MAPs as a part of the broader healthcare system¹⁶ highlights that, if their roles are clarified and transparency is upheld, they can play a valuable role in the provision of quality healthcare.

It has been argued that the financial motivations behind employing MAPs, who command lower salaries than doctors, risk prioritising cost-efficiency over quality of care¹⁵. Indeed, cost-effective staffing models can optimise resource allocation without diminishing standards of care if governance structures, training programmes, and accountability measures are rigorously enforced². However, given the above arguments around the training and clinical experience of MAPs, as well as blurred boundaries of their roles and the public's lack of awareness, it remains to be seen if this is true in relation to MAPs.

Conclusion

This study has illustrated that, while MAPs can potentially help to address workforce shortages, their integration raises complex questions in relation to training, accountability, and patient safety. The ongoing debates on the integration and regulation of MAPs underscore the complexities inherent in defining their role within the healthcare system. Concerns raised by professional bodies, such as the BMA's call for a moratorium on further expansion, reflect the need for careful evaluation and deliberation. Nonetheless, the contributions of MAPs, particularly in patient care and multidisciplinary support, highlight their potential to address systemic challenges and complement existing healthcare structures.

This study highlights the necessity for clearer governance, formalised guidelines, and well-defined professional titles to ensure MAPs are effectively integrated into the workforce without compromising patient safety or negatively impacting the progression of doctors. Establishing such frameworks could alleviate current pressures on the NHS, promote collaborative practice between MAPs and clinicians, and support sustainable healthcare delivery in the face of rising demand and persistent workforce shortages. Future policies should prioritise transparent role delineation and robust oversight to facilitate a cohesive and adaptive healthcare environment.

Future Directions

The findings of this study have indicated the need to now include the perspectives of other medical professionals. The distribution of the questionnaire to General Practitioners would enhance the validity of this research, particularly given that, in October

2024, the BMA's General Practitioners Committee for the UK (GPC UK) voted to stop the recruitment of PAs in general practice and to phase out existing roles²⁰.

Additionally, although the primary objective of this study was to examine the attitudes and preferences of current and future doctors, alongside members of the public, future research would benefit from consideration of MAPs' perspectives. Their inclusion could offer additional insights and complement the findings presented here, thereby contributing to a more comprehensive understanding of the topic.

Finally, the authors propose the use of probability sampling methods to gather further responses. This would enable a more representative sample to be generated.

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The Hidden Dangers of Fast-Food and Processed Treats: What Everyone Needs to Know

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Abstract:

Fast food and ultra-processed foods (UPFs) have become a dominant part of modern diets, offering convenience but posing serious long-term health risks. These products are typically high in salt, sugar, and unhealthy fats while lacking essential nutrients such as fibre, vitamins, and minerals. Industrial processing adds artificial colours, preservatives, and flavour enhancers that can disrupt metabolism and gut health. Regular consumption contributes to obesity, type 2 diabetes, hypertension, heart disease, and fatty liver disease, and emerging evidence links UPFs to several cancers, including colorectal and breast cancer. Marketing strategies exploit emotional triggers, colourful packaging, and social media to promote these foods, particularly to children, creating lifelong habits of poor eating. Fast food meals cause sharp spikes in blood sugar, pressure on the heart, and chronic inflammation when eaten frequently. Over time, these effects lead to multi-organ damage involving the heart, brain, liver, and kidneys. The rise in early-onset cancers and metabolic diseases in younger adults highlights the urgent need for public awareness and dietary reform. Replacing UPFs with whole foods, cooking fresh meals, reading food labels, and reducing processed snacks can help reverse these trends. Education, regulation, and personal responsibility together form the foundation for healthier future generations.

Key Words:

Fast Food, Ultra-Processed Foods, Metabolic Health, Chronic Diseases, Public Health Risks

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1. What counts as “fast food” and “processed comfort food”?

Fast food refers to meals that are prepared and served rapidly, usually by large chain restaurants such as McDonald's®, KFC®, and Domino's®. These foods are often high in fat, sugar, and salt, and they typically lack essential nutrients such as fibre, vitamins, and minerals. Processed comfort foods include items such as Mr Kipling® cakes, Cadbury® chocolates, biscuits, pastries, and commercial ice creams. These are considered ultra-processed foods (UPFs) because they are industrially manufactured using ingredients not commonly found in a household kitchen, such as artificial preservatives, flavour enhancers, emulsifiers, and sweeteners. The high degree of processing removes most natural nutrients and replaces them with synthetic additives to increase shelf life and flavour appeal. A 2023 BMJ review demonstrated strong links between frequent UPF consumption and rising levels of obesity, type 2 diabetes, and cardiovascular disease.

These are the foods many of us eat when we're stressed, tired or short on time. But they are industrial

products, not real meals, and they quietly damage our health over time.

2. How are these products marketed so effectively?

Companies use aggressive advertising strategies to make these products seem desirable, convenient, and even healthy. They rely on eye-catching packaging, catchy jingles, strategic placement in stores, social media endorsements by influencers, and promotional deals such as 'buy one get one free' or limited-time offers. Sponsorships of major global events, such as McDonald's® involvement with the FIFA World Cup, further solidify these foods as socially acceptable and even aspirational. Children are particularly susceptible to colourful branding and characters associated with these foods. Psychological studies show that such marketing can override our brain's natural signals of fullness and influence our decisions without us even realising it. *These companies know how to make food look exciting, trendy, and irresistible, so we buy more than we need and eat it more often than we should.*

3. Why do people keep choosing them?

People gravitate towards fast and processed foods because they are cheap, widely available, and require little to no preparation. They fit into busy modern lifestyles where time and energy for cooking may be limited. Additionally, food manufacturers engineer these products to hit a 'bliss point', which is a combination of salt, sugar, and fat that activates pleasure centres in the brain. This response is similar to what happens with addictive substances. Over time, repeated exposure creates habitual consumption, making it difficult to switch to healthier alternatives. *These foods are designed to make us come back for more. They're fast, tasty, and affordable, but they keep us trapped in unhealthy eating cycles.*

4. What chemicals and preservatives are inside?

Ultra-processed foods are loaded with synthetic additives that extend shelf life, enhance colour, and intensify flavour. Sodium nitrite and nitrate (E249–E250), commonly found in bacon and ham, help preserve meat and give it a pink colour but can form carcinogenic compounds in the digestive tract. Monosodium glutamate (MSG) and disodium inosinate (E631) enhance umami flavour and are frequently used in instant noodles and flavoured crisps. High-fructose corn syrup and aspartame (E951) are added to sweeten foods without using natural sugar. Emulsifiers such as polysorbate 80 (E433) and soy lecithin maintain texture in processed sauces and dressings. Artificial colours such as Allura Red (E129) and Sunset Yellow (E110) make foods visually appealing, especially to children. Preservatives such as BHA and BHT (E320–E321) help prevent spoilage but have been linked with hormonal disruptions and cancer in animal studies. *These foods contain chemicals you'd never find in a home kitchen, some of which can hurt your gut, mess with your hormones, or even increase cancer risk.*

5. What happens in the body right after a typical fast-food meal?

A typical fast-food meal, such as a cheeseburger, fries, and a sugary drink, causes a rapid spike in blood glucose due to refined carbohydrates and sugary contents. The pancreas then releases a large amount of insulin to manage the spike. This process may lead to a blood sugar crash a few hours later, causing fatigue and hunger for more sugary food. Simultaneously, the high salt content increases blood pressure, and the saturated and trans fats impair arterial flexibility, leading to temporary vascular dysfunction. This acute inflammatory response stresses the heart and other organs. Over time, repeated exposure leads to insulin resistance, hypertension, and chronic low-grade inflammation, all of which contribute to metabolic syndrome. *Your body goes into overdrive to cope with the sudden*

overload of sugar, salt, and fat. It gets tired and damaged each time you eat such as this, even if you don't notice right away.

6. How does long-term intake damage organs?

Chronic consumption of fast and ultra-processed foods leads to multi-organ damage. The heart is burdened by ongoing high levels of sodium and unhealthy fats, which accelerate the development of atherosclerosis and hypertension. In the liver, excess sugar and fat intake contribute to non-alcoholic fatty liver disease, where fat builds up in liver cells, impairing function. The pancreas becomes overworked, eventually leading to insulin resistance and type 2 diabetes. In the brain, a combination of inflammation and poor circulation increases the risk of dementia and mood disorders. The kidneys are taxed by high phosphorus additives and salt, which impair their ability to filter blood efficiently. The gut lining is eroded by emulsifiers, which alter the microbiome, promote inflammation, and reduce immune function. *These foods may seem harmless, but over months and years, they quietly wear down your heart, liver, brain, and gut, leaving you more vulnerable to serious diseases.*

7. Which diseases are most strongly associated?

Scientific literature shows robust links between ultra-processed food intake and numerous chronic diseases. Obesity and type 2 diabetes are among the most immediate consequences, driven by excess calories, poor nutrient content, and hormonal imbalances. Cardiovascular diseases such as heart attacks and strokes arise from sustained hypertension and arterial damage. Fatty liver disease and kidney dysfunction are also common. Mental health conditions including depression and dementia are now being associated with diets high in processed foods. Most concerning is the growing body of evidence linking UPFs to various cancers, including colorectal, pancreatic, and breast cancer. The World Health Organisation has officially classified processed meat as a Group I carcinogen, indicating strong evidence of its cancer-causing potential in humans. *Junk food doesn't just make you gain weight. It can damage every major system in your body and increase your risk of life-threatening illness.*

8. Why are cancers, including colon, breast, and pancreatic, rising in young people?

Cancers in younger adults have been increasing globally, with dietary factors playing a major role. Early and sustained exposure to ultra-processed foods introduces carcinogens, such as nitrosamines from processed meats and chemical emulsifiers, at a younger age. Childhood and adolescent obesity is also a significant risk factor, as fat cells release

inflammatory signals and hormones that promote cancer cell growth. Endocrine-disrupting chemicals such as bisphenol A (BPA) found in food packaging interfere with natural hormonal functions, particularly increasing the risk of hormone-related cancers such as breast cancer. Additionally, poor fibre intake and gut microbiome disruption weaken the body's natural defences against cancerous changes in the bowel. These factors create a pro-cancerous environment well before middle age. *Poor diet and chemical exposure are starting earlier than ever, giving cancer more time to grow in younger bodies.*

9. What are “empty calories” and micronutrient gaps?

Empty calories refer to foods and beverages that provide a high amount of energy with little to no essential nutrients. Examples include soft drinks, chips, sweets, and white bread. These items lack vitamins, minerals, fibre, and antioxidants that are essential for normal growth, immunity, and repair. When a person relies heavily on such foods, they often miss out on key micronutrients such as iron, calcium, folate, vitamin D, magnesium, and zinc. This deficiency can impair brain function, lower energy levels, delay wound healing, and increase susceptibility to infections. Even individuals who appear overweight can be severely malnourished at the cellular level. *You may be eating a lot but, if it is the wrong food, your body could still be starving of the nutrients it truly needs to stay strong and healthy.*

10. What practical steps can people take today for healthier eating?

Practical dietary changes can have a profound impact on health. Cooking meals in advance using whole ingredients such as vegetables, whole grains, legumes, and lean protein can reduce dependence on processed foods. Swapping out sugary snacks for whole fruits, nuts, or natural yoghurt helps balance blood sugar and provides valuable nutrients. Reading food labels is essential. If a product has more than five ingredients, many of which you can't pronounce, it is likely to be highly ultra-processed. Hydration also plays a key role; replacing soft drinks

with water or herbal teas supports metabolism and reduces calorie intake. Planning meals and keeping healthy snacks readily available at home and work can help people avoid the temptation of fast food. *You don't need to change everything at once. Start by making one healthier swap each week. Soon it'll become second nature, and your body will thank you.*

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Key Take-Home Messages

1. Ultra-processed foods are engineered to be tasty but are harmful long term.
2. Marketing tricks make unhealthy food seem normal and attractive.
3. Fast food delivers calories without real nutrition.
4. Salt, sugar, and fat overload your body quickly and repeatedly.
5. Additives and chemicals have hidden health risks.
6. Chronic diseases such as diabetes, stroke, and cancer start young when diets are poor.
7. Cancers are rising in young adults due to early and sustained exposure to junk food.
8. Processed foods are linked to mood disorders, memory loss, and brain fog.
9. Healthy eating is possible with planning, preparation, and small steps.
10. Food companies profit while your health suffers. Awareness is your defense.

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