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Original Article

## Perceptions of distance learning among Al-Qunfudhah medical students during the COVID-19 pandemic



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### المخلص

**أهداف البحث:** تقييم تصور طلاب كلية الطب تجاه التعلم عن بعد وتأثيره على أداؤهم الأكاديمي خلال جائحة كوفيد-19 في كلية الطب في القنفذة، بجامعة أم القرى، المملكة العربية السعودية.

**طرق البحث:** تم إجراء دراسة مقطعية على طلاب الطب في كلية الطب في القنفذة، بجامعة أم القرى، المملكة العربية السعودية خلال العام الدراسي 2020-2021. تم جمع البيانات من خلال استخدام استبانة عبر الإنترنت مصممة مسبقاً خلال الفترة (من 1 مارس إلى 31 مايو 2021).

**النتائج:** استجاب إجمالي 223 طالباً جامعياً للاستطلاع عبر الإنترنت بمعدل استجابة 74.3%، ومثلت الطالبات 54.3%. وتم تفضيل التعليم المدمج لدى غالبية الطلاب (73.1%). علاوة على ذلك، رأى 72.2% من الطلاب أن التعلم عن بعد يوفر وقتهم وحوالي الثلثين (61.4%) من الطلاب تم تحفيزهم من خلال توفر تسجيل المحاضرات خلال التعلم عن بعد. كما أفاد حوالي 59% و54% أن التعلم عن بعد كان أكثر راحة وحسن مهاراتهم التكنولوجية على التوالي. كان ضعف الاتصال (66%)، ومشاكل الشبكة (61.4%) من التحديات الشائعة للتعلم عن بعد. ولكن على أي حال، كانت هناك زيادة عالية ذات دلالة إحصائية في متوسط درجات الطلاب مع التعلم عن بعد.

**الاستنتاجات:** التعلم عن بعد له العديد من المزايا مثل توافر المواد التعليمية وتحسين المهارات التقنية للطلاب وتوفير الوقت. بينما كانت العقبات الرئيسية هي

مشاكل الإنترنت، وسوء الاتصال والحرمان من الممارسة الاكلينيكية الحقيقية. على الرغم من الزيادة الكبيرة في المعدل التراكمي للطلاب أثناء التعلم عن بعد مقارنة بالتعلم التقليدي، إلا أن الغالبية فضلت التعلم المدمج ليكون أفضل استراتيجية تعليمية في التعليم الطبي.

**الكلمات المفتاحية:** التعلم المدمج؛ كوفيد-19؛ التعلم عن بعد؛ التأثير؛ طلاب الطب.

### Abstract

**Objectives:** This study aimed to assess perceptions among undergraduate medical students toward distance learning and its effects on their academic performance during the COVID-19 pandemic at Al-Qunfudhah College of Medicine, Umm Al-Qura University, KSA.

**Material and Methods:** A cross-sectional study was conducted among medical students at Al-Qunfudhah College of Medicine, Umm Al-Qura University, KSA, during the 2020–2021 academic year. Data were collected through a predesigned, well-structured online survey from (1<sup>st</sup> March to 31<sup>th</sup> May 2021).

**Results:** A sample of 223 undergraduates responded to an online survey, with a response rate of 74.3%; female students represented 54.3%. Blended education was preferred by most students (73.1%). Moreover, 72.2% of students perceived that distance learning saved their time, and approximately two-thirds (61.4%) were stimulated by the availability of lecture recordings. Approximately 59% and 54% reported that distance learning was more comfortable and improved their technology skills, respectively. Poor communication (66%) and network

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problems (61.4%) were the most common challenges in distance learning. Nonetheless, a substantial increase ( $P = 0.001$ ) in students' grade point averages was observed with distance learning.

**Conclusion:** Most medical students preferred blended education combining the advantages of both traditional and distance learning strategies. The availability of educational materials, improvements in students' technological skills and time saving were the most perceived benefits of distance learning among students. However, the main obstacles were internet problems, poor communication and deprivation from real clinical practice. Despite the improvement in students' grade point averages during distance learning compared with traditional learning, blended education was recommended by the majority of participants.

**Keywords:** Blended education; COVID-19; Distance learning; Impact; Medical students

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## Introduction

After emerging cases of a novel coronavirus were initially reported in Wuhan, a large city in central China, on March 11, 2020, the World Health Organization declared it a worldwide pandemic.<sup>1,2</sup> Authorities in the Kingdom of Saudi Arabia (KSA) have observed the COVID-19 situation and its dangerous effects on humans globally since it was first detected, and have designed many strategies to limit the spread of this disease among populations in the kingdom. These strategies included measures for social distancing and public commitment to infection control measures. Given the swift spread of this infectious disease, the rising number of cases and the associated mortality, as well as the lack of therapeutic and vaccine options, many governments and health authorities implemented strict measures to fight the pandemic. These measures included community lockdown, travel and movement restrictions, and the cancellation of all forms of gatherings and events.<sup>3</sup> Universities were required to use distance learning and online teaching platforms, regardless of students' and teachers' technological competency and preparedness.<sup>4</sup>

Distance education refers to teaching and learning situations in which educators and learners are geographically separated and therefore rely on electronic devices, platforms and/or print materials for instructional delivery.<sup>5</sup> Distance learning comprises continually evolving concepts and is often referred to as online, virtual or E-learning. E-learning modalities include offline or online educational activities.<sup>6</sup> In addition, this learning strategy can range from basic conversion of in-person content to more complex deployment of digital technologies (e.g., mobile education, virtual patients and virtual reality).<sup>7</sup>

Distance learning involves two basic forms. The first is asynchronous learning, in which learners and educators cannot be online simultaneously, thus allowing learners to access the virtual learning environment at any time, and download learning materials or send messages to their educators or peers. Students may spend more time perfecting their contributions. The second is synchronous learning, which is based on the simultaneous interaction of both learners and educators; this form is more social and can avoid frustration by allowing questions to be asked and answered in real time.<sup>8</sup>

Since the 1960s, distance learning has been used worldwide for educational and training of medical students and professionals before and even after their graduation. In several instances, professionals have shown improved knowledge scores and performance in the workplace after completing distance education programs.<sup>5</sup>

Although distance educational approaches have long been recognized as an effective learning tool, because of the inadequacy of nonverbal communication, distance learning can be difficult for students. Other factors, such as interactions between students and medical educators, material accessibility and time management, might also influence online students' attitudes toward virtual learning.<sup>9</sup>

The COVID-19 pandemic required all educational institutions to implement distance learning regardless of its benefits and challenges. This abrupt and complete shift toward distance learning was a new experience for our medical students. Therefore, understanding how our students perceived distance learning and how this new experience affected their academic performance was necessary. This study was conducted to assess the perceptions among undergraduate medical students at Al-Qunfudhah College of Medicine, Umm Al-Qura University, KSA, toward distance learning and its effects on their academic performance during the COVID-19 pandemic.

## Materials and Methods

A descriptive cross-sectional study was conducted among medical undergraduate students at Al-Qunfudhah College of Medicine, Umm Al-Qura University, KSA during the 2020–2021 academic year to assess perceptions among undergraduate medical students toward distance learning and its effects on their academic performance during the COVID-19 pandemic in Al-Qunfudhah College of Medicine, Umm Al-Qura University, KSA.

The study population included undergraduate medical students registered at Al-Qunfudhah College of Medicine during the 2020–2021 academic year who agreed to participate in this study voluntarily, after being assured that all data would be collected anonymously.

Al-Qunfudhah is a Saudi city on the Red Sea coast near Alieth. The Al-Qunfudhah College of Medicine was built in 1423H by King Abdullah bin Abdulaziz Al Saud, who was an ex-chair of the Saudi Higher Education Council. It includes nine basic and five clinical departments. It is one institution in Umm Al-Qura University, one of the largest public universities in KSA, and its main campus is located in Mecca City.

Regarding the application of the distance learning process, Al-Qunfudhah College of Medicine immediately moved

to a distance learning strategy after a decision was made by the responsible authorities to impose complete lockdown of all educational institutions in the KSA to avoid health hazards of the COVID-19 pandemic and prevent its spread among the population. The Blackboard platform was adopted as the main online learning system in all educational institutions of Umm Al-Qura University. Additionally, students' assessments were conducted through another two platforms, Microsoft Teams and Cisco WebEx, which were used as a substitute for the Blackboard platform during students' learning activities or in the event of technical problems with the Blackboard platform.

#### Data collection

A pre-designed, well-structured online survey was developed by the study researchers after reviewing previous literature,<sup>10</sup> according to their observations during use of distance learning in the teaching process. Many questions were designed regarding students' engagement in the classroom during distance learning; the preparedness of medical educators to effectively use distance learning and its different modalities; the advantages of distance learning, as perceived by students; and the extent to which students enjoyed the learning approach.

A pilot study was conducted among 10 undergraduate students to ensure the validity and clarity of the questions, and assess the need for any modifications of its items to make them easily understandable to the participants. The results of this pilot study were excluded from the main study results.

Cronbach's alpha was used as a measure of internal consistency to assess the relationships among questionnaire items. The results showed that items in the applied survey had a Cronbach alpha coefficient of 0.79, thus suggesting relatively high internal consistency. A Cronbach alpha coefficient  $\geq 0.70$  is considered acceptable.<sup>11</sup>

The final form of the applied questionnaire comprised 18 questions, which were subdivided into four domains. The first domain involved a consent question to participate in the study and four questions regarding the participants' demographic data, such as age, sex, place of residence and academic level.

The second domain included six questions to explore students' perceptions regarding distance learning. Students were asked to rate their perceptions on a 3 point Likert scale (3 agree, 2 neutral or 1 disagree).

The third domain comprised five questions regarding the distance learning experience of participants, their preferences, the main effects of the sudden shift to distance education, and the advantages and disadvantages of distance learning during the COVID-19 pandemic.

The fourth domain of the survey included two questions about the students' GPAs before and after the application of distance learning.

Data were collected in a timeframe of 3 months starting from the beginning of March to the end of May 2021. The online survey was designed on a Google form and sent to students' email addresses and WhatsApp applications if students could not be reached by email. The first question in the electronic questionnaire was a brief informed consent. Participants were invited to share the survey link through

social media with other medical students at Al-Qunfudhah College of Medicine to increase the response rate through a snowball sampling technique. Many reminders were sent on WhatsApp, because it is the most commonly used communication application among medical students.

#### Data analysis

All data were extracted from the applied questionnaire and coded in a Microsoft Excel sheet, then imported to SPSS version 21 (SPSS Inc., Chicago, IL, USA) for analysis. Quantitative variables are described by mean and standard deviation. Qualitative variables are described through numbers (No.) and percentages (%). Comparison between the means of students' GPAs before and after the application of distance learning was performed with paired T tests for differences between the means of two groups of a variable. The significance of the results was assessed with P-values and was considered highly significant at  $P\text{-value} \leq 0.001$ .

#### Results

The total number of undergraduate medical students who responded to our survey was 223, with a response rate of 74.3%. The age of the participants ranged between 18 and 23 years, and female students constituted 54.3% of the study sample. All study participants were in the pre-internship stage as follows: 24.7% were from the 3rd academic level, 21.1% were from the 4th level, 21.1% were from the 6th level, 18.4% were from the 5th level, and 14.8% were from the 2nd level. Most students were from the Al-Qunfudhah district (90.6%), whereas only (9.4%) were from outside the Alqunfudhah district. Therefore, most of the students had similar residences and social circumstances with very limited variation. Students' perceptions regarding distance learning might have been affected by their place of residence: students from distant places might prefer this learning strategy to overcome the barriers of long travel, regardless of learning outcomes.

**Table 1: Students' perceptions regarding distance learning.**

Item	Disagree		Neutral		Agree	
	N	%	N	%	N	%
Teaching is often stimulating.	51	22.9	128	57.4	44	19.7
It is easy to be engaged in learning process.	82	36.8	76	34.1	65	29.2
Distance learning is more enjoyable than face-face learning.	125	56.1	53	23.8	45	20.2
Medical educators are well prepared for teaching sessions.	60	26.9	118	52.9	45	20.2
Medical educators use different modalities of teaching during distance learning.	102	45.7	86	38.6	35	15.7
Students accept incorporation of distance learning into their learning strategies.	49	22.0	60	26.9	114	51.1

Approximately 20% of students agreed that "distance teaching is often stimulating," and more than half (57.4%) felt neutral toward this statement. Distance learning was not as easily engaged with, according to more than one-third of participants (36.8%). Approximately half the participants (51.1%) accepted the incorporation of distance learning into their learning strategies, although more than half (56.1%) did not enjoy it at all (Table 1).

Online learning experience before the Coronavirus Pandemic

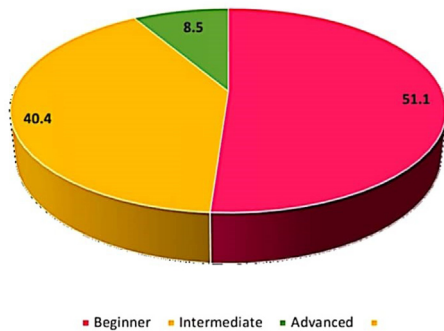


Figure 1: Online learning experiences before the Coronavirus pandemic.

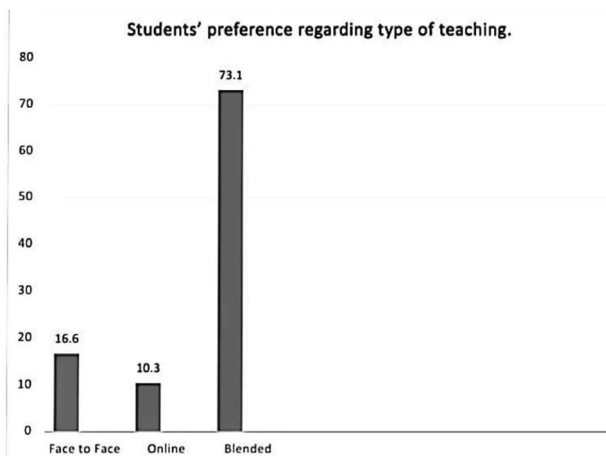


Figure 2: Students preference regarding type of teaching.

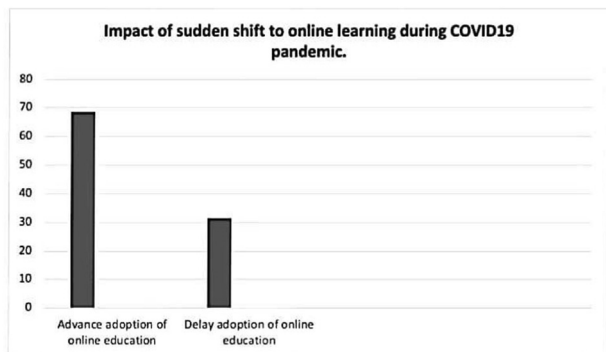


Figure 3: Impact of sudden shift to online learning during COVID19 Pandemic.

Nearly half the medical students were beginners in using online platforms (51.1%), whereas the minority had advanced levels of experience 8.5% (Figure 1).

Most students favored blended education (73.1%), whereas the 'face-to-face' modality was preferred by 16.6% (Figure 2). More than two-thirds of the study population (68.6%) thought that advanced use of distance education increased their confidence in its efficacy, whereas 31.4% decided to delay use of online education because of doubts about its efficacy (Figure 3).

Regarding the advantages of distance learning as perceived by medical students, 72.2% suggested that distance learning

Table 2: Advantages and challenges of distance education during COVID-19 pandemic.

Items	N = 223	%
<b>A. Advantages of distance education during COVID-19 pandemic</b>		
Good substitute for face to face learning	5	2.2
Saves time spent in transportation	11	4.9
Saves money spent in transportation	2	0.9
More flexible	1	0.4
More comfortable	2	0.9
Improves students' technological skills	1	0.4
Recorded lectures are available to hear it many times	7	3.1
Not at all	9	4.0
More than one answer	185	83.0
<b>B. Challenges of distance education during COVID-19 pandemic</b>		
Inadequate expertise in distance learning	8	3.6
Poor communication	6	2.7
Technology, e.g., network connections, browser compatibility,	7	3.1
Problems in adapting to new environment, for who has less technically savvy	2	0.9
Technophobia	2	0.9
Time management, e.g., time to prepare	2	0.9
Continuous assessment, grades, and exam taking	2	0.9
Mental health, i.e., pandemic-related anxiety or stress	3	1.3
Inability to absorb all knowledge and skills, and fear that this will affect performance in the future.	13	5.8
More than one answer	178	79.8

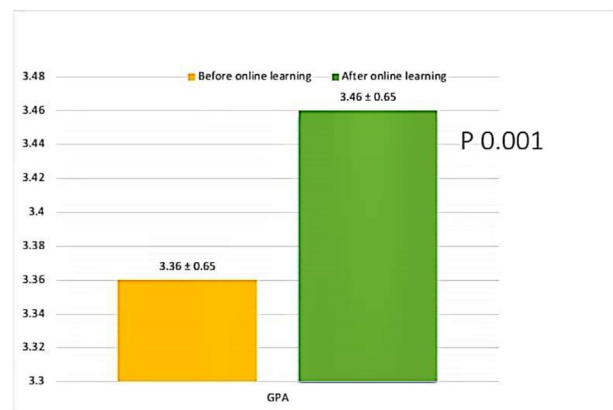


Figure 4: Students' grade point averages (GPAs) before and after application of distance learning.

saved their time spent in transportation, and 61.4% reported that the availability of recorded lectures at any time and place was the most beneficial advantage of distance learning. Approximately 59% and 54% indicated that online learning was more comfortable and improved their skills in technology use, respectively. The most documented challenges of distance learning by medical students involved poor communication (66%), network problems (61.4%), difficulty in absorbing learning, knowledge and skills (41.7%), and problems in adapting to a new learning environment 27% (Table 2).

A high statistically significant increase ( $P = 0.001$ ) was observed in the students' grade point averages (GPAs) after distance learning than before its application (Figure 4).

## Discussion

Distance learning is a teaching modality that can be used as a substitute for traditional fac-to-face educational methods. In the crisis of the COVID-19 pandemic, distance learning was the sole route for maintaining the educational process without any interruption. This study focused on the assessment of undergraduate medical students' perceptions of distance learning and its effects on their academic performance during the COVID-19 pandemic at Al-Qunfudhah College of Medicine, Umm Al-Qura University, KSA.

Most of the medical students perceived that distance learning was less enjoyable than face-to-face learning, because of a lack of interactive activities, which provide a good route for both receiving and sharing information. The students' responses also revealed that different teaching procedures were not satisfactory for them; unfortunately distance learning modalities were not as expected, and this finding might have affected students' satisfaction with distance learning. These findings were in agreement with the results of a study conducted in medical schools in the United Kingdom, which showed that students did not find distance teaching interesting or even effective, although some of them had a fair attitude when asked about interaction during distance teaching.<sup>12</sup> This result was a logical consequence of the sudden complete shift to this new learning modality without any previous preparation for both students and educators, coupled with the negative emotions associated with the COVID-19 pandemic.

Medical students considered distance learning a very useful strategy, because of many factors, such as its flexibility, saving time and money spent on transportation to and from the university, and the availability of recorded lectures to be used as an educational material and any time. Medical students also indicated that virtual learning greatly improved their technology skills and academic performance. Al-Balas et al., in Jordan, have also indicated that the main advantages of online teaching are time and money savings from less travel, flexibility and students' ability to learn at their own pace.<sup>13</sup>

Most of the study participants indicated a consensus regarding the difficulties in distance learning in the form of poor preparation, their deprivation from practicing real clinical skills in real situations with real patients, and fear and anxiety regarding their performance and achievement rates. Another drawback of distance learning was the inefficiency of online learning because of technical problems such as poor network connections or browser compatibility

problems. All these obstacles have been reported by O'Doherty et al., in their integrative review establishing that poor internet speed, and a lack of clinical experience and physical examination skills are the most common barriers to implementation of distance learning, in addition to many other obstacles that medical educators might face, such as the time needed to prepare their distance lectures and activities, in addition to a lack of institutional infrastructure.<sup>14</sup>

Most medical students were either beginners or had intermediate experience in technology use, thus making the abrupt transition to distance learning difficult. This outcome was very close to the results of a study conducted on students in public health nutrition in Norway, in which most students (95%) agreed that their learning motivation and efforts had decreased during distance learning, and all students wanted to return to campus.<sup>15</sup> In addition, most Jordanian universities have found that they lacked the necessary technology to support their students' distance learning.<sup>16</sup>

Hybrid learning was preferred by the majority of our medical students, to obtain the benefits of both learning strategies. In contrast, Albarrak et al. have reported that 56.0% of their medical students recommended face-to-face lectures as the most preferred class activities.<sup>17</sup> Effective implementation of hybrid educational strategies can clearly magnify the benefits of both distance and traditional learning strategies for both students and educators.

Approximately two-thirds of medical undergraduates believed that implementation of distance education would be improved by increasing their confidence in its learning effectiveness, in agreement with the results of an Al-Faisal University study revealing that the COVID-19 pandemic had a favorable effect on distance learning, because it encouraged medical students to use this modality.<sup>10</sup> The COVID-19 pandemic forced us to take the initiative to introduce distance learning in all educational institutions and pushed all students to use it.

Our study indicated a significant increase in students' GPAs during distance learning, similarly to the results of a study at the College of Medicine and Medical Sciences in Onaizah, KSA, in which most participants indicated that distance learning classes were clearly superior to on-campus sessions, because recorded lectures were quite valuable. This aspect was extremely beneficial to their academic achievement this year.<sup>9</sup> Good time management and the availability of recorded learning material might explain the great achievement among our medical students with the adoption of distance learning.

However, further research at Taibah University's College of Pharmacy in Almadinah Almunawwarah, KSA, has revealed that students who received a semester of distance education had inappropriate Grade Point Averages (GPAs) that did not accurately reflect their knowledge and skills.<sup>18</sup> This discrepancy between the present findings and those results may be due to many factors, such as public stress regarding COVID-19, which was an obscure disease at the time, and the greater daily increases in new COVID-19 cases and mortality among residents in large cities, such as like Almadinah, than small cities, such as Alqunfudhah city.

Another factor was the unanticipated shift to new technology, which required a good background regarding the use of technology. Thus, the current study results reflected the smooth transition at Umm Al-Qura university in ensuring that virtual learning could serve as a good substitute for

traditional learning in the emergency situation of the COVID-19 pandemic.

## Conclusion

Most medical students preferred blended education combining the advantages of both traditional and distance learning strategies. The availability of educational materials, improvement in students' technological skills and time savings were the most important benefits of distance learning, as perceived by students. However, the main obstacles were internet problems, poor communication and deprivation from real clinical practice. Despite the improvement in students' GPAs during online learning compared with traditional learning, blended education was recommended by the majority of students.

**Abbreviations:** GPAs, Grade Point Averages; KSA, Kingdom of Saudi Arabia.

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This research did not obtain any specific grant from any funding agencies in the public, commercial or not-for-profit sectors.

## Conflict of interest

The authors do not have any conflicts of interest to declare.

## Ethical approval

Ethical approval was granted by the University of Umm Al-Qura Ethical Approval Committee to conduct this study, with IRB of UQU reference No (HAPO-02-K-012-2021-03-630), ethical date is 01/03/2021.

## Authors contributions

SHA: conceptualization and study design; provision of research materials; data analysis and interpretation; editing, reviewing, drafting and critically revising the manuscript for important intellectual content, and proofing and submission to the journal website. JAA: conceptualization and study design; survey design; research materials; data collection and organization; writing initial and final drafts of the article; logistic support. AOA: study conception; survey design; data acquisition; editing of the manuscript. ZAA: survey design; data acquisition; editing of the manuscript. AKh A: design of tools for data collection; data collection; editing of the manuscript. AHA: survey; data acquisition; editing of the manuscript. SMH: conceptualization and study design; design of tools for data collection; data acquisition; drafting and editing of the manuscript, and final approval of the latest version submitted. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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