Impact and perceptions of distance learning among undergraduate nursing students: An exploratory cross-sectional study in Saudi Arabia

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A R T I C L E   I N F O

A B S T R A C T

The COVID-19 pandemic necessitated the rapid adoption of e-learning in education. Nursing students, unprepared for this shift, faced unique challenges. This study explored these challenges and influencing factors using a 53-item questionnaire completed by 184 nursing students in Saudi Arabia. Data was analyzed with SPSS version 21 at a 0.05 significance level. Most students (71%) showed positive attitudes towards e-learning, finding it useful (mean score: 3.26±0.88), with links to self-efficacy (mean score: 3.04±0.82) and time-management (mean score: 3.39±0.73). Barriers included inadequate infrastructure and technical support (mean score: 3.14±1.3), lack of training (mean score: 3.03±1.3), and poor internet connections (mean score: 3.92±1.3). Students reported uneasiness (mean score: 2.77±1.5), confusion (mean score: 2.64±1.4), stress, and nervousness (mean score: 2.55±1.4). Younger students and females showed more positive attitudes towards e-learning (p-values < 0.01 and < 0.001, respectively). Despite positive attitudes, anxiety due to lack of training and infrastructure readiness persisted. Addressing these issues is crucial to enhance the effectiveness of e-learning.

1. Introduction

E-learning is defined as a learning model that utilizes information and communication technology (Akimanimpaye and Fakude, 2015). E-learning is efficient, easy to access at any time, cost-effective, and has become an important method in education (Al-Samarraie et al., 2018; Asiry, 2017; George et al.,

2014). Teaching schemes in the current era involve exposing students to online learning materials, video lectures, and computer-based exams (Schwartzstein and Roberts, 2017). The coronavirus pandemic (COVID-19) that faced the globe in 2019 resulted in shutdowns, the mandated full dependence on online learning, online communication, and online testing and assessment methods (Abou El-Seoud et al., 2014; Tanveer et al., 2020; Thapa et al., 2021). Before the pandemic, technology-empowered education using the 'blended' approach (a combination of traditional and e-learning tools). The COVID-19 pandemic precipitated changes in the teaching/learning process in higher education and influenced the interaction between teachers and students (Abou El-Seoud et al., 2014). Because of the

pandemic, universities were forced to carry out activities with students exclusively online (Han et al., 2022). Internet-based learning became an alternative to traditional learning during the pandemic. The Ministry of Education in Saudi Arabia mandated online classes to continue the learning process in a safe and secure manner. All centers of higher learning, including medical universities, moved to online learning within days of the Ministry's mandate, which became an essential element for maintaining the activity of schools and universities (Abou El-Seoud et al., 2014).

There is no doubt that the COVID-19 pandemic has increased the emphasis on online learning in education; predictions indicate that this learning model will become a major component of nursing medical education in the current and near future. The e-learning experience is associated with barriers that need to be identified to allow designing more efficient e-learning models in the long term (Regmi and Jones, 2020). Studies in e-learning have delineated challenges into three distinct categories: personal challenges, which encompass the learner's individual personality traits, behaviors, and habits; attitudinal inhibitors, which pertain to learners' personal attitudes and perspectives towards e-learning; and contextual inhibitors, which involve external factors such as limited ICT skills or inadequate support from organizations (Regmi and Jones, 2020; Zamani et al., 2016). Despite the growing adoption of e-learning, there's a lack of research into the specific e-learning challenges faced by Saudi nursing students. Addressing this knowledge gap, our study embarked on a cross-sectional analysis to uncover the attitudes of Saudi nursing students towards e-learning, the obstacles they face, and the factors that influence these challenges. The insights aim to guide the development of more effective e-learning strategies.

2. Methods

In this study, a descriptive and exploratory approach was adopted at a university's School of Nursing in Saudi Arabia's eastern province. The research aimed to identify and analyze the e-learning challenges perceived by undergraduate nursing students during the COVID-19 pandemic and to investigate the factors influencing these challenges.

Participants were students enrolled in any of the nursing program courses (grades 1-4) at universities located in the eastern region of Saudi Arabia. A total of 441 students were enrolled in the nursing program, of which 184 students participated in this study. The convenience sampling method was utilized. While convenience sampling facilitated efficient data collection during the pandemic's constraints, we recognize its potential to introduce bias and limit the generalizability of our findings. We have carefully considered the implications of this sampling method on our results, ensuring the study's transparency and credibility. Subjects were all

nursing students, both male and female, who responded and agreed to participate in the study.

A self-reported web-based questionnaire was used to recruit study participants. It was developed by the researchers after an in-depth review of relevant literature (Linjawi and Alfadda, 2018; Thapa et al., 2021). The draft questionnaire was explored for face and content validation using three experts in survey questionnaire development and nursing education research. This was followed by piloting the final questionnaire using a representative sample of the study participants (i.e., ten nursing students). The pilot sample was not included in the final analysis. The piloting aimed to explore questionnaire inclusiveness, clearness, and burden in terms of time needed to complete all questions. The survey took around 10 to 15 minutes to finish and employed a mixed format of both open-ended and closed-ended questions using Likert-type scales.

The final questionnaire included a total of 53 questions divided across six sections: a) sociodemographic characteristics: describes gender, age, marital status, residence, grade, academic level, parents' education, family income, computer skills, computer availability, and the number of online courses completed; b) perception of e-learning regarding time-management: describes efficiency of time-management skills in line with course deadlines; c) perception of usefulness of e-learning: describes privileges and outcomes of digital technology in learning experiences; d) perception of e-learning self-efficacy: describes students' beliefs in their capabilities that empowers them to successfully undertake studies using e-learning technology, to persist in their studies and ultimately achieve better learning outcomes; e) perception of e-learning barriers: describes barriers encountered during e-learning, causing difficulty with adjusting learning style to complete responsibilities; f) perception of e-learning anxiety: describes students' anxiety regarding the use of the online learning, which might interfere with their ability to learn.

Subjects' responses were rated on a five-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). Item scores were added, and the total was divided by the number of items, giving a mean score for each subscale item, as well as the overall mean score for each subscale. Adding all five subscales gave an overall score for students' attitudes toward e-learning. Scores of less than 60% were considered to show negative attitudes toward e-learning, while scores of 60% or more signified a positive attitude towards e-learning.

Data was collected using a web-based questionnaire designed using Google Forms. The questionnaire link was disseminated to participants using official university e-mails; daily reminders were sent to increase the response rate. Data was collected within a six-week period from October 15, 2020, to the end of November 2020.

Completed questionnaires were extracted from Google Forms™, which were automatically exported

to Microsoft Excel 2013 for cleaning and coding. Descriptive and inferential statistical analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 21. Frequencies, mean ± standard deviation, Chi-square test, or Fisher's exact test were utilized as per the objectives of the study. A two-sided p-value <.05 was used for statistical significance. The open-ended responses from the mixed-format questionnaire were systematically analyzed using thematic analysis. This involved coding the responses to identify recurring themes, which were then categorized to provide deeper insights into the students' experiences and perceptions of e-learning. This thematic approach allows us to present a nuanced understanding of the qualitative aspects of our data, complementing the quantitative findings.

3. Results

3.1. Sociodemographic characteristics of study participants

In the study, a total of 184 nursing students participated by completing the survey. Most of the participants were females (n=131, 71.2%) living in urban districts (n=163, 88.6%). The majority of respondents were studying in the first (n=109, 59.2%) and second (n=54, 29.3%) classes of nursing school. The self-reported computer literacy of the participants ranged between moderate (n=37, 20.1%), good (n=55, 29.9%), and professional (n=33, 17.9%) with 46.8 % (n=86) having previous exposure to ten or more online professional development courses. Three students reported no computer literacy skills at all (1.6%). Some students reported no access to computer devices. Table 1 summarizes the sociodemographic characteristics of the study participants (n=16, 8.7%).

3.2. Attitudes towards managing time, usefulness, and the self-efficacy of e-learning

Most students (71%, n=71) had a positive attitude (score ≥60) towards e-learning, compared to 29% (n=54) who did not. Many participants agreed that e-learning is useful (mean score: 3.26±0.88) and felt it promoted self-efficacy (mean score: 3.04±0.82) and time-management skills (mean score: 3.39±0.73). However, respondents also recognized perceived barriers to e-learning (mean score: 3.24±1.10) and were neutral about anxiety related to e-learning (mean score: 2.83±1.17). Regarding time management, participants believed e-learning allowed for efficient time use (mean score: 3.15±1.4). To use e-learning effectively, they emphasized the need for training before implementation (mean score: 3.66±1.2) and stay updated with the latest technologies (mean score: 3.68±1.2). Respondents highlighted the various benefits of e-learning, noting that it provided schedule flexibility (mean score: 3.28±1.3), self-

paced learning (mean score: 3.88±1.2), and improved technical knowledge (mean score: 3.49±1.1). They also considered e-learning to be more economical (mean score: 3.2±1.4). However, participants were neutral regarding e-learning's impact on creativity (mean score: 2.86±1.3) and problem-solving skills (mean score: 2.98±1.3). Some students reported feelings of helplessness when submitting assignments via virtual systems (mean score: 2.67±1.3).

Table 1: Sociodemographic characteristics of participants (n =184)

Variable	n (%)
Gender	
Male	53 (28.8)
Female	131 (71.2)
Age	
<20 years	55 (29.3)
20-22 years	126 (68.5)
≥ 23 years	3 (1.6)
Marital status	
Single	178 (96.7)
Married	6 (3.3)
Residence	
Urban	163 (88.6)
Rural	21 (11.4)
Undergraduate current class	
1st grade	109 (59.2)
2nd grade	54 (29.3)
3rd grade	11 (6)
4th grade	10 (5.4)
Father education	
Illiterate	10 (5.4)
Primary	23 (12.5)
Preparatory	38 (20.7)
Secondary	40 (21.7)
University	73 (39.7)
Mother education	
Illiterate	17 (9.2)
Primary	22 (12)
Preparatory	40 (21.7)
Secondary	47 (25.5)
University	58 (31.5)
Family income	
< 5000 Saudi riyals	45 (24.5)
5000-10000 Saudi riyals	52 (28.3)
>10000 Saudi riyals	87 (47.3)
Computer literacy skills	
Moderate	37 (20.1)
Good	55 (29.9)
Very good	56 (30.4)
Professional	33 (17.9)
None	3 (1.6)
Computer availability	
Yes	168 (91.3)
No	16 (8.7)
Number of extra-curricular online courses taken	
< 10 courses	98 (53.2)
10-15 courses	79 (43)
≥ 15 courses	7 (3.8)

Students agreed that e-learning supports self-learning (mean score: 3.41±1.2) by increasing self-motivation (mean score: 2.96±1.3) and making learning more interesting compared to paper-based methods (mean score: 3.01±1.6). They were confident in the abilities of instructors (mean score: 3.09±1.3) and themselves (mean score: 3.06±1.3) to use e-learning effectively. Preferences for traditional versus e-learning methods were neutral overall (mean score: 2.9±2.7). Table 2 summarizes student responses regarding time management, usefulness, and self-efficacy of e-learning.

Table 2: Attitudes toward e-learning and perceived challenges amongst nursing program undergraduate students

Item	Mean score ± SD
Perception towards time-managing in e-learning	
E-learning offers the possibility to efficiently manage my time	3.15±1.4
E-learning is not efficient as a teaching method	2.97±1.3
During e-learning, I like the instructor's help and suggestions in this virtual learning environment	3.45±1.2
E-learning allows me to read online instructions actively	3.41±1.3
Students need training in e-learning before they undergo any e-learning activity	3.66±1.2
Students who use e-learning materials need to be updated with the latest trends in technology	3.68±1.2
Perceived usefulness of e-learning	
E-learning reduces students' educational costs	3.2±1.4
E-learning can possibly be regarded as a teaching tool	3.61±1.2
E-learning is regarded as an assisted learning tool	3.76±1.1
Use of online learning methods makes learning easier for students	2.91±1.4
E-learning environment improves my thinking skills	3.01±1.4
E-learning environment enhances my problem-solving skills	2.98±1.3
E-learning facilitates communication between the instructor and the students	3.04±1.9
Use of e-learning increases students' creativity	2.86±1.3
E-learning is seen as a self-paced learning environment	3.88±1.2
I can find information actively in the e-learning environment	3.14±1.4
E-learning is a learning environment which needs advanced technical knowledge to be used	3.49±1.1
E-learning assures schedule flexibility	3.28±1.3
E-learning self-efficacy	
E-learning provides more opportunities to create my own knowledge in this learning environment	3.41±1.2
Online learning instructions can enhance my learning motivation	2.96±1.3
Using e-learning is more interesting than using paper-based activities	3.01±1.6
I preferred using e-learning instead of the traditional learning style	2.9±2.7
I feel confident when I teach using online learning	3.06±1.3
I found online learning is more boring than traditional learning	3.21±1.5
I feel helpless when the instructor asked me to submit homework or assignments	2.67±1.3
I feel confident in my instructor using e-learning	3.09±1.3
Perception toward e-learning barriers	
The use of e-learning is not useful and is negative to the learning process	2.72±1.4
Lack of technical support from the institutions	3.14±1.3
Lack of training in virtual learning environment	3.03±1.3
Poor internet access and networking in the institutions	3.92±1.3
Lack of time by the instructors to guide the students on how to use learning management systems	3.36±1.3
E-learning anxiety	
E-learning is very stressful, especially when the instructor conducts online exams	2.66±1.3
E-learning is threatening, especially when it becomes the only method of learning	3.07±1.5
Learning online would make me very nervous	2.55±1.4
Sinking feeling when I think of trying to learn through online learning	2.58±1.4
E-learning makes me feel uncomfortable	2.77±1.5
E-learning makes me feel uneasy and confused	2.64±1.4
Uneasiness while performing the online test	2.63±1.5
I feel the fee to connect to the internet is very expensive	2.92±1.5
A fear the internet would disconnect at any time	3.61±1.6
Fear of destroying a large amount of information by typing the wrong key	3.19±1.5
Feeling of apprehension about using computers	2.52±1.4
Perception and Attitudes Towards E-Learning	
Perceived managing time of e-learning	3.39±0.73
Perceived usefulness of e-learning	3.26±0.88
Perceived self-efficacy of e-learning	3.04±0.82
Perceived barriers to e-learning	3.24±1.10
Perceived anxiety toward e-learning	2.83±1.17

3.3. Perceived barriers to e-learning

Students agreed that multiple barriers were encountered during their exposure to e-learning mode. Firstly, the institutional infrastructure was not ready for this learning mode since there was no technical support (mean score: 3.14±1.3), training (mean score: 3.03±1.3), with difficulties due to poor internet and networking connections (mean score: 3.92±1.3). Instructors had very narrow and strict timelines, not allowing them to sufficiently guide students on the methods of utilizing the e-learning platforms (mean score: 3.36±1.3). All these factors led to many students admitting that the use of e-learning had a negative impact since it hindered the smooth flow seen in the traditional learning process (2.72±1.4). Table 2 summarizes the students' responses in terms of barriers encountered during e-learning.

3.4. Psychological experiences with e-learning

The e-learning process was accompanied by considerable anxiety among nursing students. Feelings of uneasiness (mean score: 2.77±1.5), confusion (mean score: 2.64±1.4), stress, and nervousness (mean score: 2.55±1.4) were reported. Online tests were associated with psychological fears (mean score: 2.66±1.3) due to fears that the internet may disconnect (mean score: 3.61±1.6) or wrong typing acts resulting in wrong exam responses (mean score: 3.19±1.5). Some students reported that they found internet connection fees relatively expensive (mean score: 2.92±1.5). All these factors resulted in students feeling that using e-learning as the sole and main learning mode presents a threat (mean score: 3.07±1.5). Table 2 summarizes the psychological experiences with e-learning.

3.5. General satisfaction towards e-learning

In general, the perceptions and attitudes towards e-learning were positive. Participants were generally satisfied with time-management potential (mean score: 3.39±0.73), self-efficacy (mean score: 3.04±0.82), and usefulness of e-learning (mean score: 3.26±0.88). Contrastingly, participants admitted to the presence of considerable barriers (mean score: 3.24±1.10), which resulted in important anxiety with e-learning (mean score: 2.83±1.17). Table 2 summarizes the general satisfaction with e-learning.

3.6. Relationship between sociodemographic and e-learning experiences

Upon exploring the relationship between nursing students' demographics and perceived challenges toward e-learning, a statistical significance in the relation between age, gender, residence, and overall attitude was detected (Table 3). The overall attitudes of nursing students towards e-learning were not associated with the undergraduate nursing current class (p-value = 0.07). Residing in urban districts was associated with significantly higher rates of positive attitudes towards e-learning versus students residing in rural districts (p-value<0.01). Gender and age were significantly associated with attitudes toward e-learning (p-value<0.01). Students with younger ages (≤ 22 years) showed significantly more frequencies of positive attitudes toward e-learning as compared to older ages (≥ 23 years; p-value <0.01). Females were more likely to show more positive attitudes towards e-learning as compared to male students (p-value <.001). Table 3 summarizes the correlations between perceived nursing students' attitudes toward e-learning and their underlying sociodemographic characteristics.

Table 3: Correlation between nursing students' attitudes toward e-learning and sociodemographic characteristics (n=184)

Sociodemographic characteristics	Overall attitude n (%)		X^2	P-value
	Positive (n=130)	Negative (n=54)		
Age				
< 20 years	45 (81.8)	10 (18.2)		
20-22 years	82 (65.1)	44 (34.9)	181.87	<0.01
≥ 23 years	3 (100)	0 (0)		
Gender				
Male	35 (66.0)	18 (34.0)		
Female	95 (72.5)	36 (27.5)	33.06	<.001
Residence				
Urban	115 (70.6)	48 (29.4)		<0.01
Rural	15 (71.4)	6 (28.6)	0.934	
Undergraduate current class				
1st grade	80 (73.4)	29 (26.6)		
2nd grade	36 (66.7)	18 (33.3)		
3rd grade	7 (63.6)	4 (36.4)	0.347	0.07
4th grade	7 (63.6)	3 (36.4)		

4. Discussion

E-learning is an essential teaching method in higher education, including nursing schools. Most nursing students in this study had positive attitudes towards e-learning, recognizing its benefits for self-efficacy, usefulness, and time management. E-learning enhances self-efficacy by providing a learning environment where students can create their own knowledge, as supported by our study findings and existing literature. Thapa et al. (2021) revealed that e-learning helped students reinforce their knowledge. Most study respondents agreed that e-learning helped them to understand theoretical subjects, which is congruent with a study by Sasmal and Roy (2021). The findings on the perceived usefulness of e-learning show that many nursing students see e-learning as a self-paced learning experience. This has been reported in the study by Menon et al. (2021) in which students reported that e-learning gave them the flexibility to learn at their own pace and schedule. Additionally, a study by Salmani et al. (2022) also revealed that students were independent when using e-learning and were able to access content based on their desire to learn anytime and anywhere. Seada and

Mostafa (2017) reported that more than half of the studied sample were able to repeat any part of the lesson without limitations; students were satisfied with learning using the internet, and it saved time and increased responsibility and self-confidence. However, students in this study also had to deal with poor internet connections. This aligned with the current study, where students reported poor internet access and fear of being disconnected while they were involved in a lesson. As to how students perceived time management when participating in e-learning, our results revealed that most studies responded that E-learning materials needed to be updated to reflect the latest trends in technology. This falls in line with a minority of nursing students (approximately 34%) reporting e-learning as effective as traditional education modes (Thapa et al., 2021). User-friendly e-learning systems with reduced technical issues, supported by structured training programs, would make e-learning a practical, efficient, and cost-effective teaching method in nursing schools (Thapa et al., 2021).

In Nepal, approximately half of the nursing students demonstrated positive attitudes towards e-learning (Thapa et al., 2021). Similar to our cohort, students found e-learning to be more economical

since it did not require transportation and accommodation expenses, as confirmed elsewhere (Thapa et al., 2021). Diab and Elgahsh's (2020) research contradicted this by showing that first-year students had negative attitudes toward e-learning while the overall attitude of third-year students was positive. This may be due to variabilities in personal or institutional preparedness for e-learning implementation and delivery. A systemic review by Naciri et al. (2021) showed mostly positive perceptions as reported in 7 of 12 studies; these studies focused mainly on technology access, possession of basic computer skills, pedagogical design of online courses, online interactions, and learning flexibility.

Personal and institutional baseline unpreparedness impacts the e-learning experience negatively. Despite the fact that e-learning is a vital component of learning, some students have never experienced e-learning before the COVID-19 pandemic. The challenges in non-previously exposed students have manifested as considerable anxiety and psychological stress due to this abrupt change in learning and assessment methods without receiving prior training. These findings have been confirmed by a recent qualitative exploratory study employing a contextual design of focus groups and personal interviews with nursing program students (Nuuyoma et al., 2023); the impracticality of e-learning was compelled by an insufficient level of computer literacy skills (Nuuyoma et al., 2023). Loneliness due to not communicating with classmates during e-learning was compelled by insufficient levels of computer literacy skills (Nuuyoma et al., 2023). A qualitative study on the challenges faced by Turkish nursing students during the pandemic identified psychological difficulties, educational shortcomings, uncertainty, social and lifestyle restrictions, and family struggles as the main barriers encountered by the students (Cengiz et al., 2022). The institutional infrastructure in terms of connectivity limitations has also been confirmed elsewhere (Nuuyoma et al., 2023). Despite showing positive attitudes, most of the students complained about internet connectivity and technological failures (Nuuyoma et al., 2023). Internet connectivity and technical issues were the main drawbacks confirmed elsewhere (Thapa et al., 2021). Research by Achmad et al. (2021) identified inadequate internet access and the high cost of online learning as barriers for nursing students during the COVID-19 pandemic. Diab and Elgahsh (2020) also reported that the majority of nursing students in their study faced low bandwidth connections with frequent breakdowns during the pandemic. Negative correlations were reported between learning easiness, technical support, and distant utilization, as well as between technical support, learning stressors, and distant utilization (Thapa et al., 2021). Han et al. (2022) pointed out that enriching students with online resources and protocols for e-learning classes is essential to enhance the learning process and improve academic self-efficacy. Achmad et al.

(2021) suggested that insufficient training about online learning platforms was one of the most prominent barriers students faced in the administrative/instructor domain. Additionally, Seada and Mostafa (2017) reported that learners must have access to technology sources to be successful in online courses. Our findings underscore the critical role those technological barriers, such as poor internet connectivity and insufficient technical support, play in shaping students' e-learning experiences. These include upgrading digital infrastructure, providing technical training for students and faculty, and establishing dedicated e-learning support centers. By integrating these strategies, institutions can not only navigate current challenges but also strengthen the resilience of their e-learning systems against future disruptions.

5. Limitations of the study

This study presents several limitations that warrant consideration. Primarily, the research did not collect data regarding the specific types of devices and internet browsers that participants used for e-learning, which could have significant effects on user experience and accessibility. The use of convenience sampling may also introduce bias, as it does not guarantee a sample that is representative of the entire nursing student population. Additionally, the cross-sectional nature of the study captures the challenges and attitudes at a single point in time, which may not reflect changes over the course of the pandemic or in different stages of the student's education. Future research could address these limitations by including a more diverse sample from multiple institutions, considering the technological means of access to e-learning, and potentially employing a longitudinal design to observe changes over time.

6. Recommendations and implications

The study's findings offer valuable insights for enhancing e-learning systems within both local and international contexts. The implications of this study are multifaceted and extend to various domains of e-learning in nursing education. The research highlights the need for a resilient and adaptive educational infrastructure capable of supporting students through unforeseen challenges such as a pandemic. There's a pronounced call for institutions to provide robust psychosocial and technical support to students, facilitating a seamless transition to and engagement with e-learning platforms. The study also suggests that enhancing the digital literacy of both students and faculty is paramount to maximizing the efficacy of e-learning. Importantly, these findings suggest a roadmap for educational policymakers and administrators to formulate strategic plans that not only address current educational disruptions but also bolster the resilience of the learning environment against future crises. This can contribute to the continuity of

education without compromising quality, particularly in critical fields such as nursing, which directly impact public health and safety.

7. Conclusions

In conclusion, this study sheds light on the significant yet surmountable barriers faced by nursing students in embracing e-learning during the unprecedented COVID-19 pandemic. While attitudes towards e-learning were predominantly positive, students grappled with anxiety, primarily due to insufficient training and unprepared institutional infrastructure. These findings underscore the necessity for educational institutions to invest in comprehensive training and robust support systems to alleviate stress and augment the learning experience. By addressing these challenges, we can enhance the resilience and adaptability of our future healthcare workforce, ensuring they are equipped to thrive in a rapidly evolving digital educational landscape.

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Compliance with ethical standards

Ethical considerations

This study was approved by the Ethical Research Committee (Approval number UHB-004-09-2020). The participants provided written informed consent to participate before inclusion. Participation was voluntary, without any obligations or penalties, and anonymous to ensure the confidentiality of participants' responses. Students were educated about their right to withdraw at any time during the study. All responses were kept anonymous; no personal identifiers were collected or visible to the researchers.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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