Research Article

Surgery and Clinical Practice

Impact of E-learning on the Academic Performance Among Alzaiem Alazhari University Medical Students

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ABSTRACT

Introduction: *E-learning is the use of internet and media in education. In Sudan e-learning was introduced as educational method after COVID-19 pandemonic. This study aimed to assess the impact of e-learning on the academic performance on Alzaiem Alazhari medical students.*

Methodology: *Descriptive cross-sectional study was concluded during the period from March 2023 to February 2024. Data was collected by pre-tested structured online questionnaire to collect required information, Total of 235 students participated in the study. All data was summarized by frequency tables.*

Results: *The academic performance was improved among (56,6%) of the participants after the introduction of e-learning. Most of the participants (63.4%) prefer combination of both the online and face-to-face lectures in the educational process. Disadvantages of e-learning include bad network (76.6%), lack of electricity supply (63.8%), cost of network (29.8%), absence of interaction with doctors and other students (29.8%), loss of interest (25.5%) and technology unawareness (12.8%). Some of the participants reported that they faced the following difficulties, didn't have smart phone (6.4%), their smartphone wasn't functioning well (14.9%) and they consider the e-learning is more stressful to them (5, 2.1%).*

Conclusion: *The flexibility of e-learning in time and place along with availability of the materials impacted positively in the academic performance of the medical students. Technical problems like internet connection, availability of electricity, lack of smart phones and technology unawareness was reported as struggles of e-learning in Sudan. Educators must implement effective strategies to address these concerns to harness the e-learning potential and ensure successful and comprehensive learning environment. Ministry of higher education in Sudan along with the universities must support and supply the impoverished students with the required materials and tools to ensure the success of e-learning.*

Keywords

E-learning, Medical, Students, Academic performance, Education, Impact, University, Sudan.

Abbreviations

AAU: Alzaim Alazhari University, IRB: Institutional Review Board.

Introduction

E-learning can be defined as using the internet and other available media in the educational process [1]. It also known as online learning, web-based learning, internet-based literacy and computer-supported instruction [1,2]. Combination of the traditional physical teaching with the e-learning is called blended learning [3].

Many factors are important to ensure e-learning success and effectiveness including program designing, appropriate methods usage, suitable lectures and course contents, accessibility assurance and continuous assessment. The student's self-regulation skills and learning style play an important role in e-learning success [4]. Advantages of e-learning include time flexibility and accessibility to learners in most educational methods such as online courses, simulations, tutorials and even educational games. Because of its epidemiological benefits, the use of e-learning has been increased recently instead of or with the traditional physical method specially after the COVID-19 epidemic [4-6]. Many problems were identified after introduction of e-learning specially in the low-income countries including lack of internet access, poor internet connection, lack of smart phones or laptops and insufficient digital skills [7-10]. The technical problems like the internet connection issues result in disturbance affecting the learning flow [4,11-12]. Teachers report some disadvantages of e-learning including loss of direct or visual contact with students and difficulty in explaining some materials and physical skills [11-13]. Additionally, e-learning is thought to impact negatively on the student's mental health, which in turn affects academic performance [12,14]. To ensure success of e-learning, students need time management skills and high degree of self-discipline to stay on the schedule and manage the workload [14,15].

The education in Sudan was grounded on the physical traditional method of learning (face-to-face lectures). After the COVID-19 outbreak, e-learning was introduced in most of the educational institutions in Sudan [16-18]. This study aimed to assess the impact of e-learning on the academic performance of Alzaiem Alazhari University (AAU) medical students.

Methods

Study Design and Population

Descriptive cross-sectional study conducted from March 2023 to February 2024. The study population was composed of medical students at Alzaiem Alazhari university (AAU) in the third, fourth and fifth years, because they had the experience of both traditional face-to-face lectures and the new e-learning methods. A total of 235 students were surveyed. Data was collected through online google forms that were sent to the students in the Whatsapp groups. Data was collected online due to difficulty of conducting direct interviews due to the conflict situation in Sudan. Pilot study was done, and the questionnaire was modified accordingly.

Statistical Analysis

The statistical package for social sciences (SPSS 23) was used to summarize the data numerically (mean, standard deviation, median) and graphically (frequency tables).

Ethical Approval and Consent to Participate

Ethical approval was granted from Alzaiem Alazhari University Institutional Review Board (IRB). Written informed consent was taken from each participant with assurance of confidentiality and all rights.

Results

Total of 235 participants were included in the study. More than half of the participants were females (135, 57%). Most of the participants (224, 95.3%) were single. Regarding the residence of the participants, most of them (152, 64.7) their original residence was outside Khartoum state, while the rest of the (82, 35.3%) were from Khartoum state, as shown in Table 1. Most of the participants (84, 35.7%) were in the third year of the medical school, followed by (81, 34.5%) were in the fourth year and the rest of the (70, 29.8%) were in the final year, as shown in Figure 1.

Table 1: Demographic characteristics of the participants, (n = 235).

Variables	Frequency	Percent (%)
Gender		
Female	135	57.0
Male	100	42.2
Marital status		
Divorced	1	.4
Married	10	4.3
Single	224	95.3
Residence		
Khartoum state	83	35.3
Outside Khartoum state	152	64.7

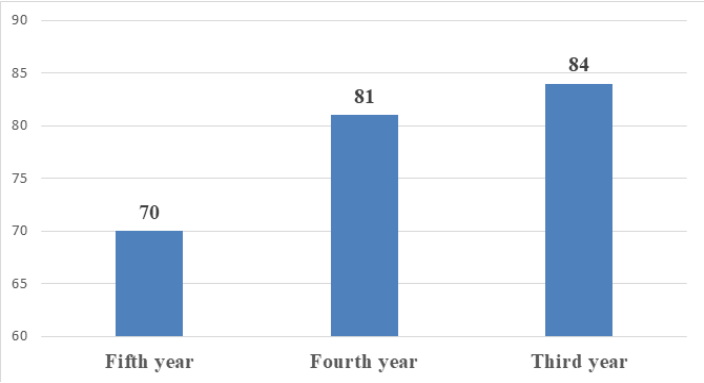

Figure 1: Distribution of the participants' according to the year of medical school, (n = 235).

Regarding academic performance, most of the participants (133, 56,6%) reported that their academic performance improved after introducing of the e-learning, as shown in Figure 2. Most of the participants (149, 63.4%) reported that they prefer both online and face-to-face lectures, (61, 26%) reported that they only prefer face-to-face lectures, while the rest of (25.10.6%) reported that they only prefer online lectures, as shown in Figure 3.

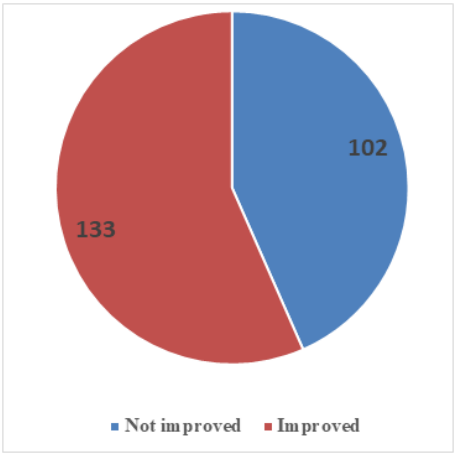

Figure 2: Distribution of the participants' according to the academic performance improvement after introduction of e-learning, (n = 235).

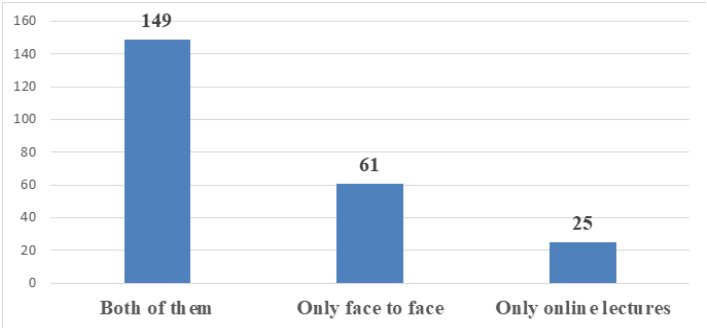

Figure 3: Distribution of the participants' according to their preference of online lectures or face to face lectures, (n = 235).

Investigation regarding perception of e-learning advantages revealed that, most of the participants (125, 53.2%) agree with the fact that the e-learning advantages include economic benefits in terms of time for students and teachers. Most of the participants (97, 41.3%) agree with the fact that the e-learning advantages include quality of teaching and learning can be increased by integrating various types of media. Most of the participants reported that e-learning doesn't offer maximum engagement of the students, and its uncomfortable community to the students, amounting for (92, 39.1%) and (94, 40.0%) respectively. E-learning brings time and location flexibility (110, 46.8%) and offers online contact with students and educator (106, 45.1%). Furthermore, e-learning gives the students control over their own lifestyle (110, 46.8%), available to global audience (116, 49.4%) and has a positive influence on knowledge acquire and retention (119, 50.6%) as shown in Table 2.

Investigations regarding the difficulties that face the students during the e-learning revealed that, most of the participants suffer from the bad network (180, 76.6%), lack of electricity supply (150, 63.8%), cost of network (70, 29.8%). Absence of interaction with doctors and other students (70, 29.8%), loss of interest during online lectures (60, 25.5%) and unawareness of some applications that used in e-learning (30, 12.8%) were also reported as difficulties or disadvantage of e-learning. Some of the participants reported that they faced the following difficulties, didn't have smart phone (15, 6.4%), their smartphone wasn't functioning well (35, 14.9%) and they consider the e-learning is more stressful to them (5, 2.1%), as shown in Table 3.

Table 2: Distribution of the participants according to their perception of the e- learning advantages, (n = 235).

Advantages	Strongly agree	Agree	Disagree	Strongly disagree
Economic in terms of time for students and teachers	83	125	22	5
Quality of teaching and learning can be increased by integrates various types of media	74	97	44	20
Offers maximum engagement of the students	31	80	92	32
Uncomfortable community to the students	94	93	83	25
Brings time and location flexibility	93	110	21	11
Offers online contract with students and educator	47	106	52	30
Allow more time for work and family	87	106	34	8
Gives the students control over their own lifestyle	83	110	34	8
Available to global audience	62	116	43	14
Positive influence on knowledge acquire and retention	62	119	42	12

Table 3: Distribution of the participants according to the difficulties that faced them during the e-learning, (n = 235).

Variables	Frequency	Percent (%)
I don't have smart phone	15	6.4
My smartphone not functioning well	35	14.9
Lack of electricity supply	150	63.8
Bad network	180	76.6
Cost of network	70	29.8
Unawareness of some applications that used in e-learning	30	12.8
Lack of internet supply because of government issues	10	4.3
loss of interest during online lectures	60	25.5
Absence of interaction with doctors and other students	70	29.8
More stress	5	2.1

Discussion

The academic performance was improved among more than half (56.6%) of AAU medical students after introduction of e-learning. This can be justified by the flexibility of e-learning in time and place along with availability of the materials for the students. Subedi et al. reported in their study that aimed to assess the effectiveness of online team-based learning; online learning was effective tool in improving students' satisfaction [19]. Similarly, Yogeswaran et al. concluded in their study that online learning showed better results than traditional textbook and classroom-

based methods [20]. Systematic review that compared e-learning with the traditional learning reported the introduction of the new electronic technology in the learning process can positively impact the educational process. Better knowledge was observed in health education after introducing the e-learning [21].

Most of the surveyed medical students (63.4%) reported their preference of both e-learning and face-to-face lectures, (26%) prefer only face-to-face lectures. Medical students still prefer face-to-face lectures along with the new e-learning teaching methods. Gherheș et al. and Abdelaziz et al. reported the same results [22,23]. Advantages of e-learning include financial benefits (53.2%), positive influence on knowledge acquire and retention (50.6%), time and location flexibility (46.8%), available to global audience (46.8%) and improve quality of teaching and learning (41.3%). Advantages of e-learning was addressed in many studies [24-26].

AAU students suffered from poor internet connection (76.6%) during their e-learning experience, lack of electricity supply (63.8%) and cost of network (29.8%). Absence of interaction with doctors and other students (29.8%) and loss of interest during online lectures (25.5%) were reported as e-learning disadvantages. A study done in Nepal to assess the e-learning during COVID-19 pandemic reported that; students suffering from lack of internet facilities and some visual problems. Additionally, they reported dislike of the students of e-learning continuation [27]. Chiner et al. reported in their study struggles with online learning include inappropriate study environment (41.2%), bad internet connection (31.4%), lack of lesson explanations (78.6%) and loss of concentration during synchronous classes (64.3%) [28]. Sindiani et al. reported in their study poor technical and internet connection and lack of direct contact are the most disadvantages of e-learning. Additionally they reported students prefer to integrate online learning with traditional learning [29].

Conclusion

Introduction of e-leaning improved the medical students' academic performance at Alziem Alazhari university. Combination of the traditional face-to-face learning with the e-learning was preferred by the surveyed medical students. In Sudan, some technical problems affect the success of e-learning including the bad network connection and electricity interruption or unavailability. Deterioration of economic situation in Sudan make the cost of internet and availability of smart phones of laptops for e-learning as burden among some the students. Universities and educators must consider the struggles that face their students in Sudan in preparing the materials for online learning. Use of simple e-learning programs, audio recorded lectures and compressed files that are easy to download are suggested to overcome the technical problems. Ministry of higher education in Sudan along with the universities must support and supply the impoverished students with the required materials and tools to ensure the success of e-learning. Further studies about e-learning in Sudan are suggested.

Declaration

Consent for publication:

Not applicable.

Clinical trial number:

Not applicable.

Availability of data and materials:

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing of interests

Authors declare that there is no competing of interest.

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Authors contribution

Hiba Salah Abdelgadir*: Designed the study protocol, participated in research implementation, data analysis, research writing and drafted the final manuscript.

Razan Nassir, Rabah Ezzaldeenm, Roba Abdallahi and Hind Salah Abdelgadir: Participated in designing the study protocol, research implementation, data collection and research writing.

Mosab Abdelgader, Ahmed Mahjoub and Salah Abdelgadir: Participated in data analysis, manuscript preparation, proofread and edited the final manuscript.

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