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Cross-sectional Study

E-Learning during COVID-19 pandemic; Turning a crisis into opportunity: A cross-sectional study at The University of Jordan

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ABSTRACT

Objectives: To assess the medical students' satisfaction and knowledge attainment through distant learning during the COVID-19 pandemic.
Methods: This is a cross-sectional, self-reported, questionnaire-based study that was conducted at the School of Medicine at the University of Jordan in April 2020. The targeted population was the students at the school of medicine. An online questionnaire was created using Google Forms. Satisfaction and knowledge attainment among students were assessed using independent-samples *t*-test.
Results: A total of 1000 medical students completed the survey, 506 (50.6%) basic science students and 494 (49.4%) were clinical science students. 655 (65.5%) of all students were either satisfied or neutral with e-learning. 63.6% of basic science students and 59.5% of clinical students stated that they gained and understood knowledge in the same way as or better than they did before initiation of exclusive e-learning. Satisfaction and knowledge gain were significantly affected by student preparedness ($p < 0.000$), teacher performance ($p < 0.000$), and website accessibility ($p < 0.000$).
Conclusion: Transition from traditional in-class teaching to distant learning, whether full or blended, is an inevitable step. In our sample, students were generally satisfied with e-learning and the knowledge attained using it. There was a significant relation between satisfaction and attainment and preparedness of students, teachers, and the medical school.

Authors' Contributions

Amjad Bani Hani conceived the original idea and supervised the findings of this work. Yazan Hijazein, Hiba Hadadin and Alma Jarkas performed the data collection and wrote the manuscript with support from Mahmoud Abu Abeele. Amjad Shattarat performed the data analysis and interpretation, and Marzouq Ammarin did Critical revision of the article and Raed Al-Taher drafted the manuscript and designed the figures. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

1. Introduction

On March 11, 2020, the Director-General of the World Health Organization publicly declared COVID-19 a pandemic. Countries worldwide put in place social distancing and stay-at-home measures to "flatten the curve" and slow the spread of COVID-19. The Hashemite Kingdom of Jordan was one such country. As such, universities in Jordan and many countries across the world had to cancel or suspend their campus activities and rely exclusively on e-learning to continue student education [1].

The term e-learning refers to learning by using electronic technology to access educational materials and curriculum outside the classroom walls. E-learning has been introduced to almost all specialties and levels of education. It has been estimated that over the next couple of years, e-learning will grow 15 folds, to account for 30% of all educational provision throughout the globe [2]. The World Federation for Medical Education global guidelines endorse technology as a key component of best-practice medical education [3].

The delivery of e-learning comprises easy access to information, updating, distribution, and standardization of content [4]. It gives the ability to revise and control content simply and quickly to meet their

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learning objects. Furthermore, it helps in distributing the content to many users simultaneously, anytime, and anywhere [5].

The COVID-19 pandemic resulted in a challenge and an opportunity to use and assess E-learning in higher education. This study aims to illustrate students' attitudes and the impact of transitioning towards e-learning methods in the faculty of medicine at the University of Jordan (UJ).

2. Methodology

This is a cross-sectional, self-reported, questionnaire-based study that was conducted at the School of Medicine at the University of Jordan in April 2020. The targeted population was the students at the school of medicine throughout the basic and clinical years of study. An online questionnaire was created using Google Forms©. Medical students from year 1 to year 6 (the final year of medical school at the University of Jordan) participated in this survey. Basic science students (BSS) comprise year one to the third year, while clinical students (CS) comprise year four to six. The questionnaire was distributed to students in basic and clinical medical years through University of Jordan e-learning platform and Facebook and WhatsApp students' groups. The questionnaire included a written consent on its first page. The questionnaire is composed of multiple sections. The first section inquiries about the gender, the level of study and current grade point average (GPA). The 2nd section assesses students' thoughts about the preparedness of his/her school and their own preparedness for e-learning use. The 3rd section enquires about the devices that the student uses in e-learning. The 4th section enquires about the tools used in e-learning, duration, and number of sessions and rating of lecturers' performances in e-learning. The 5th section compares classical teaching with e-learning, and the final section probes students' mental health in the acute setting of the COVID-19 pandemic manifested as depression or anxiety.

Data were analysed via SPSS version 25. One-way ANOVA and univariate analysis *t*-test with post hoc LSD, an independent-samples *t*-test were performed to find the relationship between different students' characteristics, surrounding circumstances and e-learning tools available with the dependent variables in terms of school preparedness, students' preparedness, the efficacy of e-learning process, and students' mental health status.

The study was approved by the Institutional Review Board of the Medical School of the University of Jordan. An informed consent was obtained by each student before participation. The study is reported adhering to the STROCCSS 2019 statement on reporting of cohort studies [6]. The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

3. Results

A total of 1000 medical students participated in the survey. Of all medical students participating in this study, 506 medical students are BSS (50.4%), and 494 medical students are CS (49.6%). Five hundred fifty-three students declared their GPA. Table 1 describes the GPA distribution of the students[Table 1].

Table 1
Statistical analysis of basic science and clinical medical students' GPA.

Mean	3.3488
Median	3.4000
Mode	3.00
Std. Deviation	0.48128
Range	2.00
Minimum	2.00
Maximum	4.00

Table 2 shows that there is a statistically significant difference in student satisfaction from e-learning between BSS and CS. 156 (30.8%) of BSS were unsatisfied compared to 189 (38.3%) of CS ($p < 0.012$). Satisfaction was also affected by students' preparedness, with 222 (42.9%) of non-experienced students being unsatisfied, while only 123 (25.5%) of experienced students expressed unsatisfaction ($p < 0.000$). Teacher performance also affected student satisfaction, with only 10 (4.8%) of students who rated a teacher's performance as unsatisfying, while 58 (12.2%) and 123 (39.3%) of students satisfied with their e-learning experience, rated teacher performance as neutral and satisfying, respectively ($p < 0.000$).

Furthermore, around 50% of all students recognize the university's E-learning website available for easy access. There was no statistically significant difference in satisfaction level when compared to students' scores on Becks' Anxiety Inventory.

Table 3 assesses clinical knowledge gained throughout the use of e-learning during the COVID-19 lockdown. Of all medical students at the University of Jordan, 63.6% of BSS and 59.5% of CS stated that they gained and understood knowledge the same way or better than before initiation of exclusive e-learning. Factors affecting knowledge gained were teacher e-learning performance, students experience in using e-Learning, and the university's e-learning website available for easy access ($p < 0.000$). Of all medical students that took the survey that rated their teacher's performance as dissatisfying, 18 (8.6%) stated they gained knowledge better than before the lockdown. In comparison, 98 (20.5%) of the students who thought that the teacher's performance was neutral and 121 (38.7%) of the students who thought it was satisfying said that they gained better knowledge ($p < 0.000$).

The most popular devices used to connect to the internet were mobile phones and laptops, with around 1000 students saying they always used these devices, as illustrated in Fig. 1. The least popular tools were the tablets and the desktop computers. The desktop computer was never used in the study population. We also asked students about their most-used platforms for e-learning, as shown in Table 5. Video conference platforms such as Zoom and Skype were used by 60% of students, and YouTube came second, with 56.7%. Moodle was used by 48.5% of students, while Microsoft Teams was the least used platform, with only 24% of students utilizing it.

Overall, 763 (76.3%) of all the students believe that the electronic devices did not cause any financial burden, whereas 144 (14.4%) believe electronic devices caused some, and 92 (9.2%) believe they did cause a financial burden. The internet connection did not cause any financial burden in 666 (66.6%) of the students, whereas 212 (21.2%) reported it caused some, and 121 (12.1%) stated it did cause a financial burden.

Among BSS, 229 (45.2%) believed that the school's e-learning infrastructure was well-established and started a long time ago. In comparison, only 83 (16.8%) of CS had the same opinion. 190 (37.6%) of BSS and 202 (40.8%) of CS believed e-learning was only applied recently before this crisis and is still evolving. Among BSS and CS students, 71 (14%) and 192 (38.9%) reported that e-learning was only used during this crisis, respectively.

When students were asked to rate their satisfaction with the recent transition to e-learning education during the COVID-19 outbreak, 244 (48.2%) of BSS and 224 (45.4%) of CS were neutral, while 108 (21.4%) of BSS and 83 (16.8%) of CS were satisfied.

4. Discussion

The introduction of the computer and the internet has forced both teachers and students to integrate the available technology in medical education. Some changes were passive, due to development that affected the world of communication and the birth of the digital native generation, which cannot separate advanced technology from their daily lives. Operational changes were introduced to the field of healthcare while also affecting the dynamic economics of healthcare education. Since the emergence of the COVID-19 pandemic, all areas of distant

Table 2
The relationship between the levels of student satisfaction and each of: gender, academic level, GPA, student preparedness, teacher e-learning performance and Beck Anxiety Inventory result.

		Student Satisfaction (All)			Total	P-value
		Unsatisfied	Neutral	Satisfied		
Gender	Male	148 (38.0%)	170 (43.7%)	71 (18.3%)	389 (100.0%)	0.394
	Female	197 (32.2%)	294 (48.1%)	120 (19.6%)	611 (100.0%)	
Total		345 (34.5%)	464 (46.4%)	191 (19.1%)	1000 (100.0%)	
Academic Level	Basic	156 (30.8%)	245 (48.4%)	105 (20.8%)	506 (100.0%)	0.012
	Clinical	189 (38.3%)	219 (44.3%)	86 (17.4%)	494 (100.0%)	
Total		345 (34.5%)	464 (46.4%)	191 (19.1%)	1000 (100.0%)	
GPA Level	C	29 (42.6%)	27 (39.7%)	12 (17.6%)	68 (100.0%)	0.501
	B	109 (32.6%)	162 (48.5%)	63 (18.9%)	334 (100.0%)	
	A	54 (35.8%)	66 (43.7%)	31 (20.5%)	151 (100.0%)	
Total		192 (34.7%)	255 (46.1%)	106 (19.2%)	553 (100.0%)	
Student Preparedness Level	Non experienced	222 (42.9%)	237 (45.8%)	58 (11.2%)	517 (100.0%)	0.000
	Experienced	123 (25.5%)	227 (47.0%)	133 (27.5%)	483 (100.0%)	
Total		345 (34.5%)	464 (46.4%)	191 (19.1%)	1000 (100.0%)	
Teacher e-learning performance	Unsatisfying	144 (68.6%)	56 (26.7%)	10 (4.8%)	210 (100.0%)	0.000
	Neutral	148 (31.0%)	271 (56.8%)	58 (12.2%)	477 (100.0%)	
	Satisfying	53 (16.9%)	137 (43.8%)	123 (39.3%)	313 (100.0%)	
Total		345 (34.5%)	464 (46.4%)	191 (19.1%)	1000 (100.0%)	
Beck Anxiety Inventory	Low	253 (33.2%)	351 (46.0%)	159 (20.8%)	763 (100.0%)	0.455
	Moderate	55 (34.8%)	79 (50.0%)	24 (15.2%)	158 (100.0%)	
	Severe	37 (46.8%)	34 (43.0%)	8 (10.1%)	79 (100.0%)	
Total		345 (34.5%)	464 (46.4%)	191 (19.1%)	1000 (100.0%)	
UJ e-Learning website is easily accessible	Strongly disagree	42 (58.3%)	25 (34.7%)	5 (6.9%)	72 (100.0%)	0.000
	Disagree	93 (42.9%)	93 (42.9%)	31 (14.3%)	217 (100.0%)	
	Neither agree nor disagree	75 (29.8%)	128 (50.8%)	49 (19.4%)	252 (100.0%)	
	Agree	122 (30.8%)	193 (48.7%)	81 (20.5%)	396 (100.0%)	
	Strongly agree	13 (21.0%)	24 (38.7%)	25 (40.3%)	62 (100.0%)	
Total		345 (34.5%)	464 (46.4%)	191 (19.1%)	999 (100.0%)	

communication and learning were accelerated, this change being permanent in many ways.[14]

Although it may be feasible for e-learning to replace classroom setting education in some fields entirely, medical education is heavily reliant on student-patient interaction, bed-side learning, and in-person attendance of surgical procedures and teaching rounds. This could pose a challenge to the incorporation of e-learning into medical teaching [7]. As such, e-learning use is highly variable among medical schools and appears to be more common in basic science courses than in clinical clerkships [4].

4.1. Student satisfaction

Teachers' performance, students' experience in using e-learning platforms and websites, and accessibility to websites have shown to have a significant impact on student satisfaction in this study as shown in Table 4. Students' satisfaction is higher when their teachers' performance was satisfying. Teacher performance in e-learning is influenced by multiple factors, including time-consuming production of e-learning materials that may interfere with physicians' busy schedules, the availability of technical support during the implementation of e-learning and the wide range of strategies to facilitate e-learning [8,9]. The variability in teacher performance can be addressed by designating permanent staff members exclusively in charge of e-learning which can assist teachers by providing details of the programs used to create e-learning content [9]. In addition to providing the appropriate infrastructure for teachers, motivational incentives may be encouraging [9,10].

Students who found the e-learning website not easily accessible were more likely to be unsatisfied with the online educational process in our study. Student satisfaction was thoroughly studied, five components were set to be the pillars of online teaching which are effectiveness, accessibility, cost-effectiveness, students' satisfaction, and faculty satisfaction [11].

To examine the effect of anxiety associated with the COVID-19 pandemic on the teaching process, we asked the students to respond to becks anxiety scale. It showed no effect on their level of satisfaction.

4.2. Knowledge attainment

More than half of the students that participated in this study stated they gained the same or even better knowledge than what they did before the lockdown. Teachers' performance and students' experience and accessibility to websites have all affected knowledge attainment.

There does not seem to be a consensus in the literature when comparing e-learning and traditional learning. In a systemic review of 50 studies used to test knowledge gains, 12 of them found significantly higher gains in the online e-learning intervention groups than traditional learning. In contrast, 27 studies did not detect significant differences or mixed results were found [12]. Another study revealed that undergraduate students preferred face-to-face learning over the e-learning teaching method. However, all students agreed that e-learning was good at teaching basic knowledge that required higher levels of thinking [13].

A study about e-learning in palliative care showed that 96% of students used e-learning as a preparation tool for their exams [14]. Another survey for evaluating the effectiveness of an online teaching module in the pediatric department showed that e-learning is effective at increasing environmental health knowledge of clinical and non-clinical professionals, assessed by a pre-test and a post-test for the clinical expertise acquired from the online modules [15]. Others have shown that educational technologies for respiratory care have an important role and that online learning for baccalaureate and higher degrees in respiratory care is promising. However, it is not easier than traditional learning methods, and it was found to be more expensive.

A study about Video-Based Learning showed that this tool's effectiveness is augmented by the teachers' consideration to management and maximizing students' engagement [16]. This suggests that when dealing with large cohorts that teach students from many courses, the development of more specific e-learning materials is required for engagement levels to be maintained. This could take the form of more targeted and specialized cases and quizzes that are more directed and

Table 3
The relationship between level of attainment of medical knowledge for all medical students and each of: gender, academic level, GPA, teacher e-learning performance and Beck Anxiety Inventory result.

		Attainment of theoretical medical knowledge (among all basic and clinical students)				Total	P-value
		I experience difficulty in understanding	I gain and understand less	I gain and understand the same	I gain and understand better		
Gender	Male	32 (8.2%)	125 (32.1%)	138 (35.5%)	94 (24.2%)	389 (100.0%)	0.478
	Female	34 (5.6%)	193 (31.6%)	241 (39.4%)	143 (23.4%)	611 (100.0%)	
Total		66 (6.6%)	318 (31.8%)	379 (37.9%)	237 (23.7%)	1000 (100.0%)	
Academic Level	Basic	35 (6.9%)	149 (29.4%)	202 (39.9%)	120 (23.7%)	506 (100.0%)	0.281
	Clinical	31 (6.3%)	169 (34.2%)	177 (35.8%)	117 (23.7%)	494 (100.0%)	
Total		66 (6.6%)	318 (31.8%)	379 (37.9%)	237 (23.7%)	1000 (100.0%)	
GPA Level	C	5 (7.4%)	28 (41.2%)	20 (29.4%)	15 (22.1%)	68 (100.0%)	0.398
	B	20 (6.0%)	108 (32.3%)	118 (35.3%)	88 (26.3%)	334 (100.0%)	
	A	10 (6.6%)	44 (29.1%)	66 (43.7%)	31 (20.5%)	151 (100.0%)	
Total		35 (6.3%)	180 (32.5%)	204 (36.9%)	134 (24.2%)	553 (100.0%)	
Teacher e-learning performance	Unsatisfying	45 (21.4%)	102 (48.6%)	45 (21.4%)	18 (8.6%)	210 (100.0%)	0.000
	Neutral	19 (4.0%)	162 (34.0%)	198 (41.5%)	98 (20.5%)	477 (100.0%)	
	Satisfying	2 (0.6%)	54 (17.3%)	136 (43.5%)	121 (38.7%)	313 (100.0%)	
Total		66 (6.6%)	318 (31.8%)	379 (37.9%)	237 (23.7%)	1000 (100.0%)	
UJ e-Learning website is easily accessible	Strongly disagree	18 (25.0%)	19 (26.4%)	21 (29.2%)	14 (19.4%)	72 (100.0%)	0.001
	Disagree	14 (6.5%)	76 (35.0%)	81 (37.3%)	46 (21.2%)	217 (100.0%)	
	Neither agree nor disagree	21 (8.3%)	77 (30.6%)	96 (38.1%)	58 (23.0%)	252 (100.0%)	
	Agree	12 (3.0%)	130 (32.8%)	163 (41.2%)	91 (23.0%)	396 (100.0%)	
	Strongly agree	1 (1.6%)	16 (25.8%)	17 (27.4%)	28 (45.2%)	62 (100.0%)	
Total		66 (6.6%)	318 (31.8%)	378 (37.8%)	237 (23.7%)	999 (100.0%)	

relevant to sub-groups of students.

Adding e-learning resources and utilizing technology to conventional Anatomy and Physiology were vital in mediating engagement and facilitating deep learning of fundamental concepts, adjusting these materials into career-specific teaching resources (how a particular organ system relates directly to their future profession) will aid learners to succeed in their studies and professions [17].

It is worth mentioning that delivering video lectures on campus does not have the benefit of flexibility and accessibility which are major features of e-lectures [18]. Another study showed that students described a lack of control, feeling like passive recipients of e-learning, and the feeling of being lost [19].

It is important to emphasize the role of the teacher or mentor in fostering the educational process. The teacher has a major role in explaining the content and highlighting concepts to deepen knowledge. This tends to improve knowledge gain and makes students more confident regarding the usefulness of e-learning [18].

4.3. Mobile use in medical education

Electronic devices constitute of mobile phones, tablets, laptops, and desktops. We found that the most used electronic device for e-learning was mobile phones, followed by laptops.

Other studies have also shown the popularity of mobile device usage among students [20,21]. In particular, the last decade has seen widespread access to mobile internet devices (MIDs), which in turn have expanded educational opportunities outside the classroom setting. Learners with a suitable MID and a link to the world wide web have ready access to a wide range of multimedia learning resources, collectively known as mobile learning (mLearning) [22]. The perceived and actual usefulness of students using mobile devices is thus context-dependent and subject to mixed messages [23,24]. The evidence-base in health professions education must move beyond mobile device technicalities to explore how it supports learning [20,23]. Students believe that mobile usage saves time, making patients' care more efficient and much easier [20,25,26]. A recurrent theme was that students were reluctant to use mobile devices in front of patients to avoid being seen as unprofessional and in front of the staff to avoid misinterpreting the reason for device usage [20,27] [–] [30].

4.4. Just in time learning

Mobile devices can be an efficient tool of learning whereby the device promoted just-in-time learning in the clinical context, repetition of learning, supplementing rather than replacing learning and making use of wasted time so that learning can be done without setback [31,32]. Mobile phone use is the simplest way for students to access information quickly during their clinical placements. It may be beneficial to include mobile phone use in medical education in an official manner and to provide students with instructions on professionalism and

Table 4
The relationship between level of attainment of medical knowledge for clinical students and each of: gender, academic level, GPA, teacher e-learning performance and Beck Anxiety Inventory result.

		Attainment of clinical medical knowledge (among clinical students only)				Total	P-value
		I experience difficulty in understanding	I gain and understand less	I gain and understand the same	I gain and understand better		
Gender	Male	63 (29.2%)	98 (45.4%)	40 (18.5%)	15 (6.9%)	216 (100.0%)	0.295
	Female	68 (24.5%)	159 (57.2%)	35 (12.6%)	16 (5.8%)	278 (100.0%)	
Total		131 (26.5%)	257 (52.0%)	75 (15.2%)	31 (6.3%)	494 (100.0%)	
GPA Level	C	10 (22.7%)	26 (59.1%)	5 (11.4%)	3 (6.8%)	44 (100.0%)	0.504
	B	51 (24.5%)	111 (53.4%)	37 (17.8%)	9 (4.3%)	208 (100.0%)	
	A	13 (30.2%)	22 (51.2%)	6 (14.0%)	2 (4.7%)	43 (100.0%)	
Total		74 (25.1%)	159 (53.9%)	48 (16.3%)	14 (4.7%)	295 (100.0%)	
Teacher e-Learning performance	Unsatisfying	43 (47.8%)	41 (45.6%)	5 (5.6%)	1 (1.1%)	90 (100.0%)	0.000
	Neutral	68 (29.3%)	119 (51.3%)	32 (13.8%)	13 (5.6%)	232 (100.0%)	
	Satisfying	20 (11.6%)	97 (56.4%)	38 (22.1%)	17 (9.9%)	172 (100.0%)	
Total		131 (26.5%)	257 (52.0%)	75 (15.2%)	31 (6.3%)	494 (100.0%)	
Student's Experience	Non experienced	91 (29.8%)	155 (50.8%)	43 (14.1%)	16 (5.2%)	305 (100.0%)	0.192
	Experienced	40 (21.2%)	102 (54.0%)	32 (16.9%)	15 (7.9%)	189 (100.0%)	
Total		131 (26.5%)	257 (52.0%)	75 (15.2%)	31 (6.3%)	494 (100.0%)	
UJ e-Learning website is easily accessible	Strongly disagree	11 (42.3%)	10 (38.5%)	4 (15.4%)	1 (3.8%)	26 (100.0%)	0.094
	Disagree	28 (33.7%)	47 (56.6%)	5 (6.0%)	3 (3.6%)	83 (100.0%)	
	Neither agree nor disagree	34 (31.2%)	43 (39.4%)	22 (20.2%)	10 (9.2%)	109 (100.0%)	
	Agree	54 (23.5%)	126 (54.8%)	38 (16.5%)	12 (5.2%)	230 (100.0%)	
	Strongly agree	4 (8.9%)	30 (66.7%)	6 (13.3%)	5 (11.1%)	45 (100.0%)	
Total		131 (26.6%)	256 (51.9%)	75 (15.2%)	31 (6.3%)	493 (100.0%)	

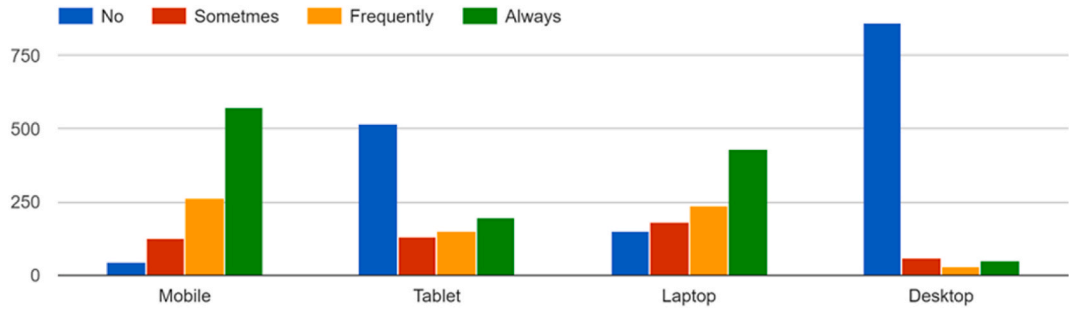

Fig. 1. The most common devices used to connect to the internet.

Table 5
The most common platforms used in e-learning in this study.

Most beneficial tool	%
Moodle	48.5
WhatsApp	28.2
Facebook	29.1
Microsoft Teams	24.0
Zoom/Skype	60
YouTube	56.7

communication skills. Thus, maintain a professional image in balance with learning and other duties as future healthcare professionals [33].

4.5. Financial burden

Jordan is an upper middle-income country that is under substantial national debt; the gross national income precipitate is estimated at around 4300 US$ with a National Debt soaring around 95% from gross domestic product and a poverty rate of about 15% [34,35]. Saying so, our study showed that 9% of students stated that electronic devices

caused financial burden and 12% of the cohort stated that internet connection did cause them financial burden. This is not high when looking at the country's economic status, yet it represents a considerable obstacle when shifting toward e-learning, this was clear in other studie [36].

5. Limitations

This cross-sectional survey is self-reported, which may cause several limitations and introduce bias. Due to the anonymity of the survey, comparing respondents with non-respondents is not possible. Students living in remote areas may have a low response rate due to the socio-economic status and difficulties in connecting to the network. In addition, the survey is somehow long for the respondents, creating random answers from the students as they lose engagement after spending too much time. Also, no identification verification is used, which may lead to inaccuracy as the web-based survey can be filled multiple times, be filled by another person like a family member or a friend and be filled by non-medical students who are out of the scope of our study.

6. Conclusion

Transition from traditional in-class teaching to distant learning, whether full or blended, is an inevitable step. In our sample, students were generally satisfied with e-learning and the knowledge attained using it. There was a significant relation between satisfaction and attainment and preparedness of students, teachers, and the medical school.

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Provenance and peer review

Not commissioned, externally peer reviewed.

Authors' contributions

Conception of the idea: A.B–H., R.A-T., H.H., and Y.H. Collection of data: A.B–H., H.H., Y.H. Data analysis and interpretation: A.B–H., R.A-T., M.A., A.S., M.A-A. Literature review: all authors. Drafting the manuscript: A.B–H., Y.H., H.H., A.J. Critical review and final approval: all authors. Accountability: all authors.

Declaration of competing interest

None.

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