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Perception of online learning during COVID-19 among medical students in the Qassim region, Saudi Arabia

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The COVID-19 pandemic results in a significant disruption in the educational process in different stages. Students with practical educational courses were the most affected by these disruptions. Despite the use of different online platforms to continue the educational process, the perception of students, particularly medical students, towards online learning is conflicting. The present study would measure the perception of medical students in the Qassim region, Saudi Arabia, about online learning during the COVID-19 pandemic and identify its strengths and weaknesses.This was a cross-sectional quantitative study that included a questionnaire which was distributed online. All medical students in basic and clinical years were eligible for inclusion. The questionnaire involved information about responders' demographics, type of online educations, and opinions towards online education during the pandemic. Statistical analysis was done through SPSS version 26. Included medical students were 308 from the Qassim region. 51.9% were female, 66.2% were in the age group 20 to 25 years old, 64.6% were in Al Qassim College of Medicine, 26.9% were in their first academic year. Laptops were used by 55.2%, where 55.8% used the blackboard program. Also, 58.1% had a GPA between 4.5 to 5 points, and 57.8% had a negative change in their GPA due to the COVID-19 pandemic. Additionally, 54.9% thought that online learning had a positive impact on education during the COVID-19 pandemic. Yes, 55.2% of the students thought that face to face teaching would be preferred in the future. As for the advantages and disadvantages of online learning, 12% thought that online learning does not have any advantages, while only 1.9% found that online learning does not have any disadvantages. Students from Unaizah College of Medicine (p-value=0.001), students with a GPA less than three (p-value=0.045), students who had a negative change in their GPA (p-value<0.001), and students who thought that online learning had a negative impact during COVID-19 pandemic, all had a significantly higher perception of the negative impact of online learning during the pandemic.The satisfaction of medical students with online learning was low, despite identifying some benefits. Similar studies are endorsed in other universities in Saudi Arabia.

Keywords: Online learning, COVID-19, pandemic, medical students, Saudi Arabia.

INTRODUCTION

Coronavirus disease (COVID-19) is caused by a novel human coronavirus that was first detected in Wuhan, China, in December 2019, then it started to spread across the world (Abbasi et al.2020) On 30th January 2020, the World health

organization (WHO) reported that COVID-19 is a public health emergency of global concern, six weeks later, the WHO announced that the COVID-19 outbreak as a global pandemic (Abbasi et al.2020).The virus is highly transmitted between individuals and diseases highly spread in the communities. There are no vaccine or treatment at the present time, so the increase in the number of cases and associated mortality cases made several governments and countries to implement strict measures including restrictions for travel, community lockdown including the closing of schools and universities and cancellation of events with non-essential gathering (Aggarwal et al.2020)as the reduction of the spread of COVID-19 can be performed by social distancing to reduce contact between individuals (Smith and Freedman 2020)

The role of technology in the academic area has gained great importance during the COVID-19 pandemic, where all educational institutions in the world closed down, and refuge to technology for learning has been taken place (Al-Harbi 2011).

Saudi Arabia has suspended Umrah on 27th February 2020 to prevent the gathering of people and reduce the transmission of the disease. Saudi Arabia was affected by COVID-19 such as other countries, on 2nd March 2020, Saudi Arabia has detected the first COVID-19 case, on 7th March 2020, the Saudi Olympics games were suspended, and the next day on 8th March 2020, the Saudi Ministry of education declared the closure of schools and suspended the teaching at universities and institutions to avoid the spread of the disease. The suspension of education in schools and universities included all educational institutions (Litvinova et al. 2019 and Bin Nafisah et al.2018)

Saudi Arabia, like other countries, depended on online learning. Online learning in Saudi Arabia is known before the COVID-19 era (Alkhalaf et al.2012) Saudi Arabia is one of the fastest-growing countries regarding online learning (CITC. 2010, 2011).There was no study reported the perception of medical students regarding online learning.

Online learning in Saudi Arabia has been reported to have positive effects on the individuals 'impact; the use of online learning increased the ability of the students to interpret information accurately (Alkhalaf et al.2012)Another Saudi study (Al-Harbi et al.2011) reported that acceptance of Saudi university students of online learning was affected by several factors, including; the attitude of students, perceived behavioral control, and electronic systems attributes.A study from Malaysia reported that positive perception of students is essential to foster the intention of individuals to use electronic learning (Al-Harbi et al.2011)

Regarding the impact of online learning on the academic performance of students, a study from the UK showed that increasing the interaction of online learning resulted in a significant positive impact on the performance of students (Rodgers et al.2008)A meta-analysis from South Africa revealed that online learning had a significant positive influence on the academic performance of students (Mothibi et al.2015)

There was only one study investigated the perception of students regarding online learning during COVID-19; the study showed that 77% of students who participated in the study reported negative perceptions, and 76% were using a mobile device for the purpose of online learning (Abbasi et al.2020)

MATERIALS AND METHODS

Study design:

A cross-section observational-questioner based study was conducted in a collage of medicine, Qassim University targeting undergraduate's male and female medical students of basic and clinical years. The sample included all male and female medical students, from first until 5th years basic and clinicals, respectively .estimated study population is 400 individuals. Data was collected validated and reliable online survey questionnaire that was distributed to target medical students to be fellfield after obtaining informed .Variables of the questionnaire was coded, then they analyzed by using the statistical package Social Sciences (SPSS).Sureness of privacy of the data was maintained during and after the study.

-Study area: The study involves College of Medicine, Qassim University, which is the first medical college in Saudi Arabia applies Problem based learning (PBL) Approach in its education.

-Study population and sampling. The study aims undergraduate's male and female medical students of basic and clinical years. All medical students had the same chance of being included in the sample as it is Probability Sampling.

-Sample size and selection of sample: The estimated population is 400 students based on information that obtained from students affairs of collage of medicine Qassim University, and the

sample size is 197 that was calculated in the website called www.surveysystem.com.

The sample size required=400

The sample size was calculated by formula from the previous website= 197

n= (Z^2*P(1-P))/d^2

Where; n=sample size, Z= level of confidence (2sided95% confidence interval, Z=1.96 for 95% CI), P= expected true proportion (0.5), d= desired precision (5%) (Taking into account the 40% non-response rate) The survey was sent to all enrolled medical students (n = 400) via their college e-mail. The students could access the survey with any electronic device that is capable of accessing their email.

-Inclusion criteria:

Basic and Clinical medical students in Qassim University, college of medicine

-Exclusion criteria:

-Non Qassim medical students

-POST-Gradates medical students study.

Data collection:

Data was collected using an online survey that was investigate; demographics of medical students (sex, year, device used in online learning), perception about online learning, satisfaction toward using online learning, advantages, and disadvantages of online learning.

-The primary outcome and other study variables:

I want to study the perception of online learning among medical students from different perspective, including:

1-Demographic: Age, Gender, Marital status, Academic year

2-Grade Points average (GPA)

3-Differnts effects of online learning (doctor students interactions, grades, exams, internet connections issues, time consumption, clinicals skills

4-Is the future better with online learning or traditional

5- Is it a modern way that can be used in the next future

-Research instrument (questionnaire) including a note about its validation:

We will use the questionnaire used previously in the study by (Abbasi et al.2020).

-Data Management e.g., safe storage of data:

The data was collected from each survey filled by students and saved in an excel sheet. The data secured and used for research purposes only.

Data Analysis Plan

The collected data was transferred to the SPSS program for statistical analysis.Qualitative and quantitative variables was represented using numbers and means, respectively. Chi-square and T-test were used to describe the possible correlations between different variables; P-value was considered significant at ≤0.05. Confidential.

Ethical considerations:

Medical students from basic and clinical were invited to participates on a voluntary basis. They have the option to refuse to complete the questionnaire even after starting. The privacy of their information was maintained. Ethical approval was obtained from the regional ethical board in Qassim.

RESULTS

Three hundred and eight students responded to this survey study and were eligible for inclusion. Characters of responders and analysis of variables are described below.

General demographics of students:

Out of 308 students, 51.9% were females, while age was classified into four groups, starting from less than 20 years to between 31 to 35 years old. 66.2% of the responders were in the age group 20 to 25 years old. Additionally, 98.1% were single. As for academic information, 64.6% of the students were in Al Qassim College of medicine, while 35.4% were in Unaizah College of medicine. As for the academic year, 26.9% were in their first academic year, as illustrated in table 1.

Table 1: General demographics of students

		Count	Percent
Gender	Male	148	48.1
	Female	160	51.9
Age group	Less than 20	99	32.1
	20 to 25	204	66.2
	26 to 30	4	1.3
	31 to 35	1	0.3
Marital status	Single	302	98.1
	Married	6	1.9
Academic college	Al Qassim college of medicine	199	64.6
	Unaizah college of medicine	109	35.4
Academic year	First-year	83	26.9
	second year	58	18.8
	third year	42	13.6
	Fourth-year	57	18.5
	Fifth-year	68	22.1

The Grade points average (GPA) of the students were evaluated, where 58.1% of the students had

a GPA between 4.5 to 5 points, followed by 34.1% having a GPA between 3.5 to 4 points, as shown in figure 1.

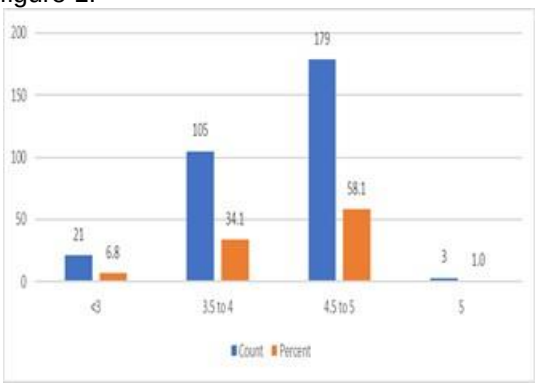

Figure 1: The Grade Points Average (GPA)

Impact of COVID-19 on education and GPA:

The students were asked about the impact of COVID-19 on their studies and grades. It has been shown that 57.8% of the students had a negative change in their GPA due to the COVID-19 pandemic, while 54.9% of the students thought that online learning had a positive impact on education during the COVID-19 pandemic, as described in table 2

Table 2: Impact of COVID-19 on education and GPA

		Count	Percent
Change in GPA between first and covid-19 semesters	Positively change	178	57.8
	Negatively change	130	42.2
Impact of online learning during COVID 19 on education	Positive impact	169	54.9
	Negative impact	139	45.1

As for the devices used for online learning, 55.2% of the students used laptops, while only 5.5% used their mobiles for this purpose, as illustrated in figure 2.

Perception of online learning

Furthermore, a set of questions were asked to the students to measure their perception of online learning during the pandemic. It has been shown that more than half of the students were satisfied by online teaching, while described the impact of online teaching less than traditional teaching. Also, more than 60% of the students found that online teaching affected teacher-student interactions negatively and increased the isolation between teachers and students. As for the advantages of online learning, 78.2% of the students mentioned that it has lots of advantages, and 88.6% thought that it would save time, as illustrated in table 3.

Advantages and disadvantages of online learning

The most common perceived advantage by the student for online learning was that it could save more time for studying among 23.4%, while 12% of the students thought that online learning does not have any advantages. On the contrary, the most perceived disadvantage was the technical problems, particularly those related to connection problems, among 36.4%, while only 1.9% of the students found that online learning does not have any disadvantages, as illustrated in table 4.

Commonly used programs in online learning

As for the programs used for online learning, 55.8% of the students used blackboard, and 17.5% used both blackboard and zoom, only 0.3% used Microsoft office programs, as shown in table 5.

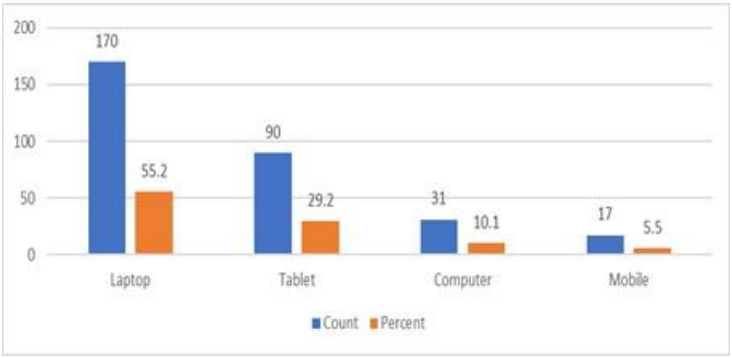

Figure 2: The device used in online learning

Table 3: Perception of online learning

		Count	Percent
Online learning better than traditional learning	Agree	140	45.5
	Disagree	168	54.5
Satisfaction with online teaching	Yes	175	56.8
	No	133	43.2
The impact of online teaching is less than traditional teaching	Yes	186	60.4
	No	122	39.6
Online teaching affects teacher-student interactions negatively	Yes	220	71.4
	No	88	28.6
Online teaching increased the isolation between teachers and students	Yes	203	65.9
	No	105	34.1
Online learning is not secured	Yes	118	38.3
	No	190	61.7
Online learning has a lot of advantages	Yes	241	78.2
	No	67	21.8
Online learning saves time for students to study more	Yes	273	88.6
	No	35	11.4
Online learning has dis-advantages like increasing the chance of homework abuse between students	Yes	182	59.1
	No	126	40.9
online teaching is useful in the clinical part of the study as a medical student	Yes	42	13.6
	No	266	86.4

Table 4: Advantages and disadvantages of online learning

		Count	Percent
Advantages of online learning	More time to study	72	23.4
	Comfortable	68	22.1
	Flexibility	52	16.9
	Less expensive	40	13.0
	Time-saving	39	12.7
	None	37	12.0
Disadvantages of online learning	Technical problems	112	36.4
	Boring	23	7.5
	Inability to concentrate	56	18.2
	Isolation	61	19.8
	Less interactive	29	9.4
	Less understanding	21	6.8
	None	6	1.9

Table 5: Commonly used programs in online learning

	Count	Percent
Blackboard	172	55.8
BB - Zoom	54	17.5
YouTube	14	4.5
Zoom	11	3.6
Notability	11	3.6
PowerPoint	6	1.9
Pdf expert	3	1.0
IDK	2	0.6
Note	2	0.6
Microsoft Office programs	1	0.3
More than one program	23	7
I don't know	9	2.9

Impact of online learning during COVID-19 over different variables:

In order to measure the negative impact of online learning during the COVID-19 pandemic, a score was calculated for perception questions, such that each response indicating a negative impact of online teaching was given one point. The higher the total score for a responder, the more negative impact perceived by this responder. The average score was 6.3±3.0, with a maximum score of 12.

Mean score was then compared over different variables using one-way ANOVA testing and level of significance p-value<0.05. it has been demonstrated that students from Unaizah college of medicine (p-value=0.001), students with a GPA less than three (p-value=0.045), students who had a negative change in their GPA (p-value<0.001), and students who thought that online learning had a negative impact during COVID-19 pandemic, all had a significantly higher perception of the negative impact of online learning during the pandemic, as shown in table 6.

Table 6: Impact of online learning during COVID-19 over different variables

		Mean	SD	Minimum	Maximum	P-value
Gender	Male	6.6	2.9	0	12	0.110
	Female	6.1	3.1	1	12	
Marital status	Single	6.3	3.0	0	12	0.791
	Married	6.7	2.7	3	12	
Age group	Less than 20	6.3	3.1	1	12	0.897
	21 to 25	6.4	3.0	0	12	
	26 to 30	6.3	3.9	3	11	
	31 to 35	4.0	0	4	4	
Academic college	Al Qassim college of medicine	5.9	2.9	0	12	0.001*
	Unaizah college of medicine	7.1	3.2	1	12	
GPA	<3	6.8	3.2	1	11	0.045*
	3.5-4	5.7	2.9	0	12	
	4.5-5	6.7	3.0	1	12	
	5	5.3	1.5	4	7	
Change in GPA	Negative change	8.1	2.7	2	12	<0.001*
	Positive change	5.1	2.6	0	11	
Academic year	First-year	6.7	2.9	1	12	0.544
	second year	6.6	3.3	2	12	
	third year	5.9	3.3	1	12	
	Fourth-year	6.1	2.9	1	11	
	Fifth-year	6.2	3.0	0	11	
Device used	Computer	6.1	2.9	0	10	0.507
	Laptop	6.6	3.1	1	12	
	Mobile	5.7	2.6	2	10	
	Tablet	6.1	3.1	1	12	
Impact of online learning during COVID-19	Negative	8.9	1.7	4	12	<0.001*
	Positive	4.2	2.1	0	10	

*p-value at level of significance< 0.05

DISCUSSION

The educational process has been severely impacted by the COVID-19 pandemic, particularly with the banning of face-to-face teaching in most settings (Khalil et al.2020) The most severely impacted students are those who have practical courses, such as medical students (Sarwar et al.2020)

Despite the use of online teaching platforms and strategies to continue the academic education, students with different backgrounds have different perception towards this mode of learning during the pandemic (Guillasper et al.2020)

The present study aimed to measure the perception of medical students in different basic and clinical stages in the Qassim region, Saudi Arabia, towards online learning during the COVID-19 pandemic. The study demonstrated a significant negative impact of online learning during the pandemic on medical students, despite mentioning some advantages. It has been shown that more than half of the students had a negative impact on their GPA during the pandemic, with the same proportion preferring face to face teaching in the future.

Furthermore, the study was able to spot the

students who were most negatively impacted by online learning, revealing that students from Unaizah college of medicine (p-value=0.001), students with a GPA less than three (p-value=0.045), students who had a negative change in their GPA (p-value<0.001), and students who thought that online learning had a negative impact during COVID-19 pandemic, all had a significantly higher perception of the negative impact of online learning during the pandemic.

The perception of students towards online learning has been evaluated in different aspects. (Bączek et al.2020) evaluated the perception of Polish medical students towards online learning during the COVID-19 pandemic, demonstrating that technical problems were the most significantly perceived barrier to online learning, in addition to isolation and being less active (Bączek et al.2020).Also, most of the students preferred face to face teaching compared to online teaching (Bączek et al.2020).

Similarly, the present study demonstrated that the most perceived disadvantage of online learning was technical problems, particularly those related to internet connections. Also, 19.8% of the students found it more isolating, and 9.4% described it as less interactive. Additionally, the present study demonstrated that the most perceived advantage for online learning was saving more time for studying among 23.4% of the students.

Also, (Baticulon et al.2020).examined the barriers to online teaching for Philippine medical students during the COVID-19 pandemic. (Baticulon et al. 2020).enrolled 3670 medical students from different universities, showing that 83% of the students used laptops for online learning, and the technological barriers were the most significant issues with online learning. Baticulon et al. 2020 mentioned that academic progress was negatively impacted by online modes during the pandemic (Baticulon et al. 2020)

Similarly, the present study demonstrated that 55.2% of the students used laptops for online learning and that the GPA of more than half of the students was negatively impacted by online education during the pandemic. Also, technical problems were the most significant disadvantage among the Saudi student's cohort.

Additionally, (Wang et al. 2020) measured the perception of medical students towards online learning during the COVID-19 pandemic in China by sending the questionnaire to 225329 medical students. (Wang et al. 2020) showed that students who had previous experience with online learning before the pandemic were more satisfied and less negatively impacted by online learning during the pandemic. Although 45.1% of the Saudi medical students in the Qassim area thought that online learning had a negative impact during the COVID-19 pandemic, the study did not examine the experience of the students with online learning prior to the pandemic.

The present study had some limitations; the study was performed in only one area in Saudi Arabia, which is not feasible to extend the results to other areas in Saudi Arabia. Also, the responses of the students depend on their personal opinions and experiences in their own educational setting, which might impair the reliability of the study.

CONCLUSION

Medical students are significantly affected by the pandemic, with a considerable proportion of the students having a significant negative impact on online learning during the COVID-19 pandemic. Technical problems were the most perceived disadvantage and the barrier to online learning. This barrier should be considered by university boards if they would proceed with online teaching in the future. Similar surveys are highly recommended in other areas in Saudi Arabia and on a national level to identify any other potential barriers.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

MSA: Conception, Administration, Analysis, drafting and approval of the final version.
AKA: Conception, design, data acquisition, drafting, approval of the final version.

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