

## IMPACT OF COVID-19 PANDEMIC ON LEARNING OF UNDERGRADUATE MEDICAL STUDENTS: A CROSS-SECTIONAL STUDY FROM KARACHI

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### ABSTRACT

**Objective:** To assess the impact of COVID-19 pandemic on learning of undergraduate medical students of Karachi.

**Study Design:** A cross-sectional, observational study.

**Place and Duration of Study:** Study was conducted at conducted at the different public and private medical colleges, Karachi, from Mar to Apr 2020.

**Methodology:** Google survey form based cross-sectional study conducted at the different public and private medical colleges, Karachi from March till April 2020. Non-probability consecutive sampling technique was used. This questionnaire consisted of 13 items which focused on the impact of COVID-19 pandemic on the learning of undergraduate medical students from Karachi.

**Results:** The study was conducted on 110 undergraduate students. Out of which, majority of the participants were from third year 45 (41%) and second year of MBBS 25 (23%). It was found that almost 71% of the undergraduate students had less likely to remember and understand material taught in online class and 60% had less likely to get answers to their queries as compared to regular classes. The results also showed that 49% of the undergraduate students were disturbed by technical issues during online classes. Furthermore, it was also found that learning of 54 out of 110 undergraduate students was always affected due to loss of clinical rotations. Strong association were also found in between online satisfaction and stressful condition due to online classes.

**Conclusion:** It was concluded that COVID-19 pandemic greatly affected the learning of the undergraduate medical students and have negatively impacted their satisfaction level towards their studies.

**Keywords:** COVID-19, Corona virus, Corona pandemic, Distant learning, Medical students, Online classes.

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### INTRODUCTION

The pandemic caused by novel corona virus (COVID-19) has shaken the globe, affecting the life physically, socially and emotionally. It has disrupted the whole scenario and caused us to re-structure the various foundation of societies and forced us to find innovative way to earn and learn. COVID-19 has long lasting impacted on the educational system especially the medical education and career. Various clinical and medical institutions have suspended their classes to restrict the transmission of the corona virus. This disruption have actually set the profound consequences on the medical universities as they are now conducting distant classes and remote assessment through online methods<sup>1</sup>. Likewise, trajectory of

medical studies have changed with COVID-19 and panic in the medical student is palpable. Thereby these days the medical universities and other educational sectors are considering the utilization of video conferencing platforms to facilitate student engagement and interaction, so that preventive measures could be maintained appropriately and also the students could complete their curriculum context<sup>2</sup>. The replacement of in-person classes with online equivalent is an obvious necessity of this time, but medical students have lost the opportunity for personal growth and development and create a loss of collaborative experiences that has the potential to be significantly detrimental to their medical career.

As the corona pandemic poses further burden on the healthcare system, it inevitably causes disruption and hindrance in the medical education all around the world. Thereby, arrangements

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could be made to retain the medical knowledge and clinical skills of the students. For instance, online teaching methods and video conferencing platforms are used to substitute clinical teaching and in-person lectures potentially. These methods were considered effective to tackle the education crisis in the current situation of corona pandemic<sup>1</sup>.

Although many researches revealed that there is no significant difference in the student learning outcomes when compared to traditional face to face teaching methods with the online methods<sup>3-5</sup>. However, they are particularly different in the way of instructions delivery, teacher student interaction and content delivery<sup>6,7</sup>. Nevertheless, the limited interaction while online teaching could result in the decreased satisfaction and thereby affecting the learning of the students so adaptation aren't always perfect. Therefore, this study aim was to assess the impact of COVID-19 pandemic on learning of undergraduate medical students from Karachi.

**METHODOLOGY**

This was a cross-sectional survey conducted at the different public and private medical colleges (Sindh Medical College, Dow Medical College and Karachi Medical & Dental College), Karachi through a non-probability consecutive sampling technique. The total sample size was 110, including all MBBS and BDS undergraduate students who enrolled in defined medical college and universities. However, non-medical students were excluded in this survey. Data was collected through detailed google survey form. This study involved the collection of anonymous student feedback surveys during a 2 month period from March till April 2020. Responses of the student surveys were analyzed after taken agreed consent from and ranked according to the greatest overall challenge experienced by all undergraduate students. This google form consisted of 13 questions that focus on the impact of COVID-19 pandemic on the learning of undergraduate medical students. The survey was anonymous and the identities of the students were kept confidential. SPSS

version 20.0 was used for data entry and analysis. The responses were analyzed through frequencies and percentages. The bar chart and pie chart were used for graphical presentation. And Chi-square and Fisher's exact test of independence were applied to evaluate the association between the impact of COVID-19 pandemic and the learning of undergraduate medical students. A *p*-value  $\leq 0.05$  was considered statistically significant.

**RESULTS**

The present study was conducted on 110 undergraduate students with 75% response rate. Results showed that out of 110, majority of the participants were from third year 45 (41%) and second year of MBBS 25 (23%). It was observed that 84 (76%) of the university was offering online classes (fig-1).

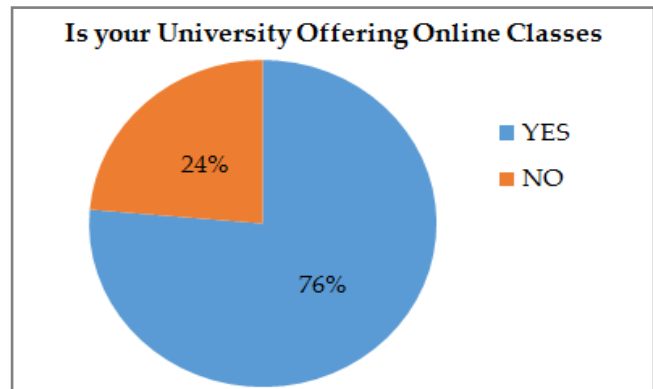


Figure-1: Percentage of university offering online classes.

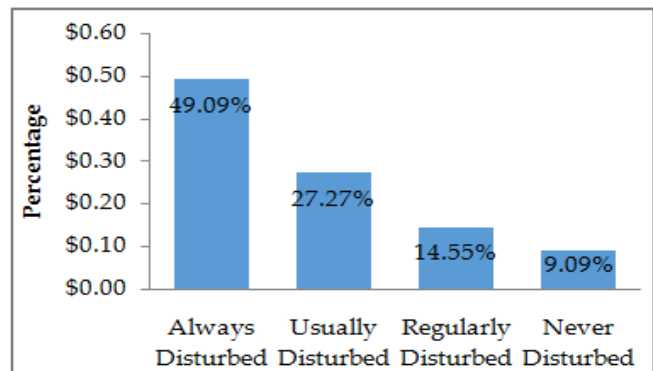


Figure-2: Percentage of online classes disturbed by technical issues.

According to the online questionnaire, it was found that 78 (71%) undergraduate students had

less likely to remember and understand material taught in online class as compared to regular class and 66 (60%) had less likely to get answers to their queries as compared to regular classes. It was also observed that 60 (55%) undergraduate students had less likely to attend online classes as compared to regular classes (table-I).

online classes. It was observed that 32 undergraduate students were very dissatisfied with online class due to loss of clinical rotation. However, 42 undergraduate were very dissatisfied due to inadequate alternatives to practical learning in online classes. Strong association were also found in between online satisfaction and stressful condi-

**Table-I: Frequencies of following aspects of online classes of studied undergraduate students (n=110).**

	Frequency (%)
<b>How likely are you able to remember and understand material taught in an online class compared to regular class?</b>	
Less likely to remember and understand than regular classes	78 (71)
More likely to remember and understand material taught than in regular classes	10 (9)
The same as regular classes	22 (20)
<b>How likely are you to get answers to your queries regarding the subject?</b>	
As likely to get answers as classes in college	32 (29)
Less likely than classes at college	66 (60)
More likely than classes in college	12 (11)
<b>How likely are you to attend online classes compared to regular classes?</b>	
As likely to attend as regular	44 (40)
Less likely to attend than regular classes	60 (55)
More likely to attend than regular classes	6 (5)

**Table-II: Level of affected by online classes of studied undergraduate students (n=110).**

	Never Affected	Sometime Affected	Regularly Affected	Usually Affected	Always Affected
How significantly is your learning affected by the loss of clinical rotations?	14 (13)	12 (11)	16 (14)	14 (13)	54 (49)
How affected are your studies by the lack of access to study specimens in museums?	26 (24)	10 (9)	20 (18)	24 (22)	30 (27)
How affected are your studies by the unavailability of libraries during this pandemic?	20 (18)	14 (13)	14 (13)	22 (20)	40 (36)

However, results showed that 49% of undergraduate students were disturbed by technical issues during online classes (fig-2).

It was also found that learning of 54 out of 110 undergraduate students was always affected due to loss of clinical rotations. Similarly, learning of 30 undergraduate students was always affected due to the lack of access to study specimens in museums while studies of 40 undergraduate students was affected due to unavailability of libraries during this corona pandemic (table-II).

Results also found the level of satisfaction of undergraduate students while studying through

tion due to online classes. It was found that 34 students had more stress while attending online classes compared to regular classes. It was also observed that 20 students were very satisfied with face to face classes in the university. A *p*-value of all the association were found to be statistically significant (table-III).

**DISCUSSION**

As the corona pandemic poses further burden on the healthcare system, it inevitably causes disruption and hindrance in the medical education all around the world. Thereby, arrangements could be made to retain the medical knowledge and clinical skills of the students. For instance,

online teaching methods and video conferencing platforms are used to substitute clinical teaching and in-person lectures potentially. These methods were considered effective to tackle the education crisis in the current situation of corona pandemic<sup>1</sup>.

Out of total participants, 76% were taking online classes. Out of which 71% undergraduate students had less likely to remember and understand material taught in online class, 60% had

hers<sup>8,9</sup>. Moreover, students having low capabilities to monitor and regulate their own learning processes have critical time while taking and learning via online methods<sup>10</sup>. Thus, this whole process leads to dissatisfaction and ultimately decreased learning and disengagement during online classes. Researchers found that students' satisfaction with the new program format and served as the basis for inter and intra departmental program improvement plan designed at

**Table-III: Association of the level of satisfaction of online classes of studied undergraduate students (n=110).**

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	p-value
<b>How satisfied are you with online classes?</b>						
Never affected	8 (7.2%)	2 (1.8%)	4 (3.6%)	-	-	<0.01
Sometime affected	-	4 (3.6%)	6 (5.45%)	2 (1.8%)	-	
Regularly affected	2 (1.8%)	4 (3.6%)	10 (9%)	-	-	
Usually affected	6 (5.45%)	4 (3.6%)	2 (1.8%)	2 (1.8%)	-	
Always affected	32 (29%)	10 (9%)	8 (7.2%)	-	4 (3.6%)	
<b>Are you being offered adequate alternatives to practical learning in online classes?</b>						
Never	42 (38%)	8 (7.2%)	14 (13%)	-	-	<0.01
Sometimes	2 (1.8%)	8 (7.2%)	-	2 (1.8%)	-	
Regularly	4(3.6%)	6 (5.45%)	8 (7.2%)	2 (1.8%)	-	
Usually	-	2 (1.8%)	2 (1.8%)	-	2 (1.8%)	
Always	-	-	6 (5.4%)	-	2 (1.8%)	
<b>How stressful is attending online classes compared to regular classes?</b>						
About the same	10 (9%)	4(3.6%)	8 (7.2%)	4 (3.6%)	2 (1.8%)	<0.01
Less stressful	4 (3.6%)	8 (7.2%)	10 (9%)	-	2 (1.8%)	
More stressful	34 (31%)	12 (11%)	12 (11%)	-	-	
<b>How satisfied are you with face to face classes in your university?</b>						
Very dissatisfied	10 (9%)	-	6 (5.45%)	-	4 (3.6%)	<0.01
Dissatisfied	-	2 (1.8%)	4(3.6%)	-	-	
Neutral	8 (7.2%)	2 (1.8%)	4(3.6%)	2 (1.8%)	-	
Satisfied	10 (9%)	10 (9%)	4(3.6%)	-	-	
Very satisfied	20 (18%)	10 (9%)	12 (11%)	2 (1.8%)	-	

*\*Statistically Significant*

less likely to get answers to their queries and 55% undergraduate students had less likely to attend online classes as compared to regular classes. This ID due to the fact that the limited interaction while online teaching could result in the decreased satisfaction and thereby affecting the learning of the students<sup>6,7</sup>. Furthermore, students having low confidence in using internet sources and technological platforms might be less engaged in online learning strategies as well as have very low opportunities for interaction with the teach-

maintaining and enhancing student satisfaction and overall program quality<sup>11</sup>.

Online classes is basically a revolutionary turn in this technological era and modern world. However, the enrollment in the online classes usually decreases concerning low retention rates than the normal regular and traditional classes. According to our results, 49% of the undergraduate students also showed dissatisfaction during online classes that was attributed towards the technical issues experienced during the online

classes. This is in agreement with other studies where authors have suggested that technological readiness of the online students should not be overestimated as students are not always comfortable with the educational technologies<sup>12</sup>. Likewise, previous studies found that students desired to take simple academic lecture online while preferred tough and important lecture face-to-face. In order to satisfied students' needs build teacher presence and guidance into face-to-face sections of courses for students<sup>13</sup>.

Remote and distant learning due to the corona pandemic have also affected the learning of undergraduate medical students due to loss of clinical rotations, lack of access to study specimens in museums and also due to unavailability of libraries. Results also found the level of satisfaction of undergraduate students while studying through online classes was very low due to loss of clinical rotation, inadequate alternatives to practical learning in online classes and also due to the stressful conditions during the online classes. These changes might seem minor but can potentially produce drastic changes in the career progression of the medical students. The replacement of regular classes with online classes was the basic necessity in these days of the corona pandemic but it has also created the potential loss of collaborative experiences that was the core of the medical education. Cancellation of rotations have remarkably decreased the relationship building and skill acquisition of the current medical undergraduate students. Also the opportunities for the personal development of the medical students<sup>14,15</sup>.

Thus, students' adaptability and innovation are two key factors that could be implemented to improve the collaborative skills within the medical students. This could be done by navigating the challenges of the remote learning and to plan for the unique inter-professional collaboration that would increase their ability to think out of the box. Furthermore, the quality, difficulty level and the content length should match with the online and technological readiness of the students so as to potentially increase their satisfac-

tion level of online learning. Moreover, the teaching speed should be adjusted for the effective delivery of the content and also to increase the concentration of the students during online learning. Additionally, timely feedback should be given to the students from the teachers and course facilitators to ensure prompt and maximum facilitation to the students during online learning. This could be done through the use online video tutorials and online presentations and lab demonstrations. Also the methods for increased participation and qualitative interaction during online classes should be encouraged to improve the depth and degree of students' learning and to motivate them towards high quality participation. Thereby, every possible way should be adopted to relieve the anxiety level of the students in the crisis of the corona pandemic to ensure active and effective engagement of the undergraduate medical students during online learning<sup>2,17</sup>. In addition, providing a practical evaluation of faculty training practices and online undergraduate student satisfaction data to contribute to the body of knowledge whether faculty professional development improves student satisfaction and whether training effectiveness varies by faculty degree status or faculty longevity<sup>16,18</sup>.

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### CONCLUSION

It was concluded that COVID-19 pandemic greatly affected the learning of the undergraduate medical students and have negatively impacted their satisfaction level towards their studies.

### CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

### REFERENCES

1. Mian, A. and S. Khan, Medical education during pandemics: a UK perspective. *BMC Medicine* 2020; 18(1): 1-2.
2. Bao W. COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behav Emerg Tech* 2020; 2(2): 113-5.
3. Allen M, Bourhis J, Burrell N, Mabry E. Comparing student satisfaction with distance education to traditional classrooms in

- higher education: A meta-analysis. *Am J Dist Educ* 2002; 16(2): 83-97.
4. Biner PM, Welsh KD, Barone NM, Summers M, Dean RS. The impact of remote site group size on student satisfaction and relative performance in interactive telecourses. *Am J Dist Edu* 1997; 11(1): 23-33.
  5. Brown BW, Liedholm CE. Can web courses replace the classroom in principles of microeconomics?. *Am Econ Rev* 2002; 92(2): 444-48.
  6. Chang SH, Smith RA. Effectiveness of personal interaction in a learner-centered paradigm distance education class based on student satisfaction. *J Res Technol Educ* 2008; 40(4): 407-26.
  7. Gazza EA, Matthias A. Using student satisfaction data to evaluate a new online accelerated nursing education program. *Eval Program Plann* 2016; 58(1): 171-75.
  8. Liang JC, Tsai CC. Internet self-efficacy and preferences toward constructivist Internet-based learning environments: A study of pre-school teachers in Taiwan. *J Edu Tech Soci* 2008; 11(1): 226-37.
  9. Tsai CC, Chuang SC, Liang JC, Tsai MJ. Self-efficacy in Internet-based learning environments: A literature review. *J Edu Tech Soc* 2011; 14(4): 222-40.
  10. Sun JC, Rueda R. Situational interest, computer self-efficacy and self-regulation: Their impact on student engagement in distance education. *Br J Edu Tech* 2012; 43(2): 191-204.
  11. Gazza EA, Matthias A. Using student satisfaction data to evaluate a new online accelerated nursing education program. *Eval Program Plann* 2016; 58(1): 171-75.
  12. Bawa P. Retention in online courses: Exploring issues and solutions. A literature review. *Sage Open* 2016; 6(1): 2158244015621777.
  13. Jaggars SS. Choosing between online and face-to-face courses: Community college student voices. *Am J Dist Edu* 2014; 28(1): 27-38.
  14. Ferrel MN, Ryan JJ. The impact of COVID-19 on medical education. *Cureus* 2020; 12(3): 1-8.
  15. Kane RT, Shaw M, Pang S, Salley W, Snider JB. Faculty professional development and student satisfaction in online higher education. *Online J Dist Learn Adm* 2016; 19(2): 105-15.
  16. Kane RT, Shaw M, Pang S, Salley W, Snider JB. Relationships among faculty training, faculty degree, faculty longevity, and student satisfaction in online higher education. *Online J Dist Learn Adm* 2015; 18(4): 1-4.
  17. Serhan D. Online learning: Through their eyes. *Int J Instruc Media* 2010; 37(1): 19-25.
  18. Kuruvilla A, Norton S, Chalasani S. Best practices in initiating online programs at public institutions. *ISSN 1931-0285 CD ISSN 1941-9589 Online* 2010; 2(1): 769-73.
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