Original Article

Perceptions Of Digital Medical Education Among Post Graduate Medical Students: Mixed Method Survey In Covid 19 Situation

Dr. Aditya Telkar*, Dr. Ravikumar K**, Dr. S R. Nigudgi***, Dr. Shreeshail Ghooli****

*Post Graduate,**Assistant Professor, ***Professor & HOD, ****Statistician, Department Of Community Medicine, M R Medical College, Mahadevappa Rampure Marga, Sedam Road, Kalaburagi (Gulbarga), Karnataka, India -585105

Abstract: <u>Background</u>: Digital health literacy and digital skills should become prerequisite competencies for health professionals to facilitate the implementation and leverage the potential of digital technologies to improve health. The primary objective of our study was to investigate perceptions of medical students on the role of online teaching in facilitating medical education during the COVID-19 pandemic. <u>Material And Methods</u>: A cross-sectional study was conducted at the national level using both offline and online (mixed) survey for a period of 3 months (Dec - Feb 2020) with a self-administered questionnaire devised on the basis of a literature search "on current online teaching methods following the Covid-19 pandemic situation" among the Post Graduate medical students. <u>Result</u>: Our Study responses consisted of post graduate medical students (n=398) across India among them 29.9% agreed to that online teaching is helpful during covid-19 situation. Some of the barriers include experience, mode of accessing, tools used, internet facilities, availability of Audio-visual aids, user friendliness of soft-ware. <u>Conclusion</u>: During Covid -19 pandemic online lectures provided a sustainable method of teaching-learning. Some of the facilitators in our study include web learning teaching mode, feasibility of class timing, easy grabbing of information, able to answer during online exam or class.[Telkar A Natl J Integr Res Med, 2021; 12(3): 59-67]

Key Words: Postgraduate Medical Students, Digital Medical Education, Digital Literacy, Covid-19, Perceived Barriers.

Author for correspondence: Dr. Ravikumar K, Assistant Professor, Department of Community Medicine M.R. Medical College, Kalaburagi, Karnataka -585105 E-Mail: raviskurle@gmail.com Mobile: 8971037433

Introduction: World Health Organization (WHO) took a global step of declaring Covid-19 a pandemic disease after the spread of the Covid-19 virus across the country starting from China, Bangladesh, Iran, Italy, and almost all countries in the world[1]. Following which all the countries were forced to put lockdown restrictions which had a greater impact on an economic breakdown in countries especially low- and middle-income countries like India[2]. In spite of all the restrictions, the virus spread globally and increased the burden of the caseload on the health care providers including the postgraduate students[3]. With this, the curriculum of postgraduate students had a greatly being affected halting of lectures, clinical examinations, and practical aspect of teaching. This way there was a sudden shift in teaching methods towards online mode teaching and learning[4].

Digital health literacy and digital skills should become prerequisite competencies for health professionals to facilitate the application and influence the potential of digital technologies to improve health education[5]. With this background, our study focused mainly to investigate the perceptions of medical post graduate students on the role of online teaching in facilitating medical education during the pandemic situation of COVID-19.

Digital health technologies could be seen as the key solution to the challenges faced in pandemic situation like COVID 19 and this help billion of life to be saved and kept safe across nation worldwide. For instance, open source technologies have enabled low-cost distribution and access to data and health information, technologies have offered various channels for citizens and health care workers besides physical consultations, and products have been developed to improve diagnosis and treatment of COVID-19[6,7].

However, extensive and sustainable implementation of digital technologies, both into specific clinical settings and into national health systems[8-10], has been advancing slowly. Health care professionals play a crucial role in diagnosing their patients in using digital health technologies appropriately. Thus, the need to improve the digital knowledge and competencies of health workers and citizens of county to take advantage of digital technologies and facilitate

implementation should emphasized frequently on the international policy level[11,12].

Major barriers to the successful implementation of digital health technologies are (1) health care professional cynicism and unwillingness toward implementing digital technologies (2) the lack of coordinated, formal education and[13,14]. Going forward with these challenges, medical education, and an effective culture of learning should drive the meaningful digitalization of health care[15]. However, to effectively present respective topics in medical education, the needs of key investors and the status of the medical curriculum should be considered[16-18].

In this paper, we present and discuss the results of Indian Scenario study assessing the expectations and needs of medical students regarding digital health competencies and the implementation of digital health in the medical curriculum. Training physicians and nurses in the practical use of digital technologies at an early stage of their career helps to prepare them for their future challenges[19].

In this context, data literacy is considered a decisive skill for health care workers[20]. Digital literacy of students and new physicians, who are often referred to as the generation of digital natives, is discussed uncertainly in the literature.

Although some authors postulate that rising up with digital services may lead to differentiated use in a professional situation, other publications stress that the implication of the digital well knowledge persons would leave learners unsupported and technologies will be used in inappropriate ways, making further research in this area indispensable[21-23].

Material & Methods: Study participants included all the postgraduate medical students from the registered Indian Medical Colleges. Ethical approval for this study was granted by the institutional ethics committee of the Mahadevappa Rampure Medical College (HKES/MRMCK/IEC/210210). Participation in the study was voluntary.

Before the study, all participants provided their oral consent. A cross-sectional study was conducted at the national level using an online survey for a period of 3 months (Dec - Feb 2020) with a self-administered questionnaire devised on the basis of a literature search "on current online teaching methods following the Covid-19 pandemic situation". The question items were initially mailed and informally discussed with a group of medical students then undergone a careful reviewing and editing process.

The remaining items in the questionnaire comprised a blend form of question styles. Certain questions were conditional. Open-ended text responses were also collected and underwent thematic analysis whereby responses were categorized into basic demographic data, perceived benefits of online teaching, perceived facilitators of online teaching and perceived barriers of online teaching.

Study Design: We chose a mixed methods approach consisting of an abductive, qualitative study based on a cross-sectional survey study using a web-based questionnaire and one to one interaction with the local post graduate students.

Qualitative data included results from the open-ended questions of the questionnaire. Items from the questionnaire with a five-point Likert-type scale as a response format were considered quantitative data.

Standard general demographic informative question first set. Next second set there were binominal 'yes' or 'no' question rated 1 and 0 respectively. Third set questions where the possible answers ranged from 0 ("strongly disagree") to 6 ("strongly agree"), the answer options "agree" and "disagree" were represented in frequency, as they were situated exactly in the middle of the extremes 0 and 6.

Total about 658 participant students were approached through mail based on round wise calculation in set of 3 round, of which 398 responded to questionnaire and showed willingness to participate in the survey.

Then data was imported into the Microsoft excel 2019 from google form, next step was to correctly complying data between quantitative and qualitative data, SPSS statistics 25 using this the Data analysis was done in the form of tabulation and graphs. Results were expressed in terms of frequency and percentages.

Results: Results are as follows.

Table 1: Demographic Characteristics Of Study Population

Characteristics	Distribution	Frequency	Percentage
Age	20-30	356	89.4
	31-40	38	9.5
	41-50	4	1.0
Gender	Female	239	60.1
	Male	159	39.9
Year	Postgraduate 1st year	155	38.9
	Postgraduate 2nd year	87	21.9
	Postgraduate 3rd year	156	39.2
Total		398	100.0

Table 2: Perceived Barrier Of The Study Population Regarding Online Lecturing

Sl. No	Questions	Response	Frequency	Percentage
1	Do You Have Your Own Sufficient Equipment (Desktop/Laptop) To Participate For Online Lectures?	No	80	20.1
		Yes	318	79.9
2	Do You Have Your Own Sufficient Facilities (Internet/Software) To Participate For Online Lectures?	No	41	10.3
		Yes	357	89.7
3	You Have Sufficient Computer Or Other Device Knowledge To Manage Your Online Learning?	No	59	14.8
		Yes	339	85.2
4	Have You Ever Experienced Online Teaching Before COVID-19 Pandemic?	No	272	68.3
		Yes	126	31.7
5	E-Learning Tools Are Easy To Use?	Agree	202	50.8
		Disagree	23	5.8
		Neutral	115	28.9
		Strongly Agree	40	10.1
		Strongly Disagree	18	4.5
6	E-Learning Are Difficult Than Classroom Teaching?	Agree	154	38.7
		Disagree	94	23.6
		Neutral	95	23.9
		Strongly Agree	47	11.8
		Strongly Disagree	8	2.0
7	Home Environment Is Suitable For Participating Online Lectures?	Agree	137	34.4
		Disagree	96	24.1
		Neutral	72	18.1
		Strongly Agree	43	10.8
		Strongly Disagree	50	12.6
8	Guidelines/Links Are Provided (Ex. How To Use Relevant Online Tools) Before Starting Online Lectures By Your Lecturer?	Almost Always	140	35.2
		Never	25	6.3
		Once In A While	72	18.1
		Rarely	49	12.3
		Sometimes	112	28.1
9	Lnconsistent/Poor Contact And Communication With The Lecturers?	Almost Always	83	20.9
		Never	12	3.0
		Once In A While	86	21.6
		Rarely	22	5.5
		Sometimes	195	49.0
10	Concerns Being Neglected By The Tutor?	Almost Always	45	11.3

		Never	56	14.1
		Once In A While	88	22.1
		Rarely	102	25.6
		Sometimes	107	26.9
11	Mode Of Accessing E-Learning?	Desktop	2	0.5
		Laptop	25	6.3
		Mobile	176	44.2
		Tablet/Ipad	8	2.0
		Multiple Device	187	47

SI	Question	Tool	Yes Frequency	Yes Percentage	No Frequency	No Percentage
12	Are You Familiar With These Tools Used In Online Teaching Learning?	Google Meet	362	91.0	36	9.0
		Zoom	380	95.5	18	4.5
		Med Whiz	238	59.8	160	40.2
		Webex Meet	295	74.1	103	25.9
		Microsoft Team	146	36.7	252	63.3
		Go To Webinar	187	47.0	211	53.0
13	Problems For Not Attending Online Classes?	Bad Internet			227	57.0
		Inappropriate Timing			81	20.4
		Not That Important Topic			25	6.3
		Uncomfortable			65	16.3
14	User-Friendliness Of The Software Used For E-Learning?	Not At All			8	2.0
		Not Really			40	10.1
		Somewhat			212	53.3
		Undecided			70	17.6
		Very Much			68	17.1

Table No 2: Perceived Facilitators Of The Study Population Regarding Online Lecturing

SI. No	Questions	Response	Frequency	Percentage
1	Web-Based Teaching Is Important For A Student?	Agree	119	29.9
		Disagree	37	9.3
		Neutral	194	48.7
		Strongly Agree	12	3.0
		Strongly Disagree	36	9.0
2	Face Any Issues During E-Learning?	Almost Always	59	14.8
		Never	7	1.8
		Once In A While	63	15.8
		Rarely	33	8.3
		Sometimes	236	59.3
3	Easy To Grab Information	Not At All	26	6.5
		Not Really	86	21.6
		Somewhat	190	47.7
		Undecided	47	11.8
		Very Much	49	12.3
4	Gained Experience Of Learning In A New Online Environment?	Not At All	12	3.0
		Not Really	34	8.5
		Somewhat	234	58.8

		Undecided	40	10.1
		Very Much	78	19.6
5	Feasibility Of Class Timing?	No	54	13.6
		Not Always	182	45.7
		Yes	162	40.7
6	Sincerity Level Of The Attendees Of Online Class?	Not At All	33	8.3
		Not Really	79	19.8
		Somewhat	171	43.0
		Undecided	60	15.1
		Very Much	55	13.8

Table No 3: Perceived Effectiveness Of The Study Population Regarding Online Lecturing

Sl. No	Questions	Response	Frequency	Percentage
1	Interested Towards E-Learning?	Not At All	26	6.5
		Not Really	99	24.9
		Somewhat	153	38.4
		Undecided	70	17.6
		Very Much	50	12.6
2	E-Learning Make Your Quarantine Time A Useful One?	Agree	154	38.7
		Disagree	40	10.1
		Neutral	135	33.9
		Strongly Agree	47	11.8
		Strongly Disagree	22	5.5
3	E-Learning Improve Your Study Knowledge?	Agree	153	38.4
		Disagree	53	13.3
		Neutral	129	32.4
		Strongly Agree	31	7.8
		Strongly Disagree	32	8.0
4	E-Learning Helps You To Acquire Skill?	Agree	127	31.9
		Disagree	100	25.1
		Neutral	106	26.6
		Strongly Agree	15	3.8
		Strongly Disagree	50	12.6
5	Student-Teacher Interaction During Online Teaching &Amp; Learning?	Almost Always	45	11.3
		Never	40	10.1
		Once In A While	106	26.6
		Rarely	80	20.1
		Sometimes	127	31.9
6	Online Lectures Are Effective Than Traditional/Live Classroom Lectures?	Agree	29	7.3
		Disagree	126	31.7
		Neutral	134	33.7
		Strongly Agree	17	4.3
		Strongly Disagree	92	23.1
7	Keep Online Learning Along With Traditional Classroom Learning?	Agree	141	35.4
		Disagree	46	11.6
		Neutral	103	25.9
		Strongly Agree	67	16.8
		Strongly Disagree	41	10.3
8	Able To Answer Questions Appropriately During Online Class/ Exams?	No	91	22.9
		Not Always	155	38.9
		Yes	152	38.2

Our Study sample or responses consisted of student (n=398) across India mainly belonging to various Department who are pursuing their post graduation. Majority consisted of 20-30 age group 356 (89.4%) among which female 90.8% and male 87.4%. Total number of female participants consist of 239 (60.1%) and number of male consist of 159 (39.9%). The distribution according to the year -wise first year 38.9% second year 21.9% final year 39.2%.

Own sufficient equipment like Desktop/Laptop yes 79.9% and no 20.1%. Once sufficient facilities like Internet for online lecture or teaching yes 89.7% and no 10.3%. Knowledge regarding the management of online classes/devices yes 85.2% and no 14.8%.

Experienced online teaching before covid 19 pandemic no 68.3% and yes 31.7%. Is online learning important for students 48.7% said neutral, 29.9% agreed, 3% strongly agree.

Interested towards e-learning only 38.4% somewhat, 12.6% very much. Was e-learning useful make in your quarantine time agreed 38.7%, neutral 33.9%. Did e-learning improve your study knowledge agreed 38.4%, neutral 32.4%.

Discussion With the rise of COVID-19, it is unsurprising that many medical institutions have resorted to online education platforms. However, online education has been used previous this pandemic. Here, we discuss how this pandemic has shaped the use of online teaching currently as well as its application in the future of medical education.

This impact of COVID-19 on uptake of online teaching for medical student.

Our study found a significant increase in the time spent on online teaching platforms before and during the pandemic particularly among medical postgraduate students. This was expected, as the secondary source of education and engagement of students with their medical school was online, in addition to the pre-existing classroom teaching method. Hence, the cancellation of offline class may have accounted for the greater proportion

of medical students engaging with online teaching for more than 15 hours, which is larger than that of normal in students.

Our results showed that participants would like online mode of teaching sessions to be more communicating when compared to classroom session. This can be made possible through introduction of different methods of teaching like quizzes, ratings, opinion polls and other brainstorming ideas which can be done through new apps like Kahoot, slido, wordscape, word cloud. Students mentoring is also important for the continuous learning where the social environment with active participation of student can make the abstract unanswered concepts very much clear.

Our main barriers for the online mode of teaching were availability of sufficient equipment, internet facility, knowledge regarding use of softwares, previous online teaching experience, links from lecturers, poor communication from the lecturer, negligence by the lecturer, accessibility, non familiarity of tools, monitoring, user friendliness of softwares. Some of the barriers in other studies include online teaching appear to be family distractions, Internet connection and the timing of tutorials.

This may difficulty for students with large families or with limited Internet access. Moreover, the mental health of students, recently shown to be impacted by the COVID-19 pandemic[24], may be adversely affected as indicated by the free text responses. This may in part, attributed to the lack of interaction with friends and colleagues leading to a rise in anxiety. Alternatively, with exams being open book and with an unrestricted setting, students may be less prone to exam anxiety[25]. Although, this does not address the family and noise disturbances which may still affect exam performance.

Some of the facilitators were web based teaching, easy grab of information, easy interaction between teacher and students, timely availability, can be done anywhere, attendance, feasible class timings, hours of teaching increased with online teaching. Some of the facilitators in other studies include medical schools have halted clinical placements; this opportunity could provide more exposure, undoubtedly impacting the development of medical students. However, for those who are not volunteering due to living with vulnerable household members or having health conditions themselves, this would put them at a

disadvantage as their peers continue to gain clinical exposure.

Some of the effectiveness include students showed interest to e-learning, e-learning made their quarantine time useable, increased their study and knowledge, acquired new skills, amble of interaction among student and teacher, ablity to answer well during online exams.

Some of the facilitators in other studies showed that effective learning method such as problem-based learning (PBL) or team-based learning (TBL) which have been shown to improve learning outcomes[26,27], student motivation and understanding[28]. Students are set online materials to study and are then are expected to discuss content in person in a group tutorial[29].

This allows students to study at their own pace, in a manner suitable to them, while also holding them responsible for their own learning. While students find PBL sessions to be interactive and to improve self-directed learning[30,31], TBL has been found to be more engaging and 'conducive to learning' in preclinical settings, due to smaller groups, ensuring timely tutor feedback[32-34].

Conclusion: With availability of facilities for online lectures with majority of participants online lectures is a possibility and sustainable mode of teaching. During covid -19 pandemic it provided a sustainable method of teaching-learning methods. Some of the barriers include experience, mode of accessing, tools used, internet facilities, availability of Audio-visual aids, user friendliness of soft-ware, guidelines not provided, poor contact of students. Some of the facilitators in our study include web learning teaching mode, feasibility of class timing, easy grabbing of information, able to answer during online exam or class, student- teaching interaction during e-learning.

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Conflict of interest: None
Funding: None
Cite this Article as: Telkar A, K R,Nigudgi S, Ghooli S. Perceptions Of Digital Medical Education Among Post Graduate Medical Students: Mixed Method Survey In Covid 19 Situation. Natl J Integr Res Med 2021; Vol.12(3): 59-67