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ORIGINAL ARTICLE

Online Medical Education: A look into the various perceptions, among students across India

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ABSTRACT

Background: The students during the Covid time had been made to adopt online education to socially distance and pursue the curriculum at the safety of their homes. This type of education is important as the future demands learning to be a hybrid of both online and offline. The study was done with an objective of identifying various perceptions about online medical education among the students. **Methodology**: The cross-sectional study was done among 578 students across various medical colleges in India and the data was collected using online platform where the questionnaire was regarding socio-demographic details, advantages and disadvantages, teacher's quality, hinderances and suggestions with respect to online education. The data collected was analyzed using SPSS 21. **Results**: Out of the 578 subjects 386 (66.8%) were females and 413 (71.5%) responses were from private college. In the study 449 (77.7%) students were from the state of Tamilnadu. The study showed a significant increase in the number of students using various learning modalities like video lectures. Power point and pre-recorded lectures/tutorials after the advent of online classes. Most of the students reported the maximum concentration time for videos and pre-recorded lectures/tutorials, and least for PDF/ MS Word document. The study showed that 314(54%) students preferred blended or hybrid learning in the future. **Conclusion:** In the study the students reported the need for high self-discipline and motivation considered necessary for the online education. The students reported more biased attention and use of video-based lectures in terms of increased time spending and concentration time. So the revised modules should be made available with importance towards visual capture and to reduce the monotony of the medical education.

Key Words: Hybrid learning, Medical Students, Online education

Introduction

In the late months of 2019, the Corona virus disease 2019 (COVID-19) was first described in Wuhan, Hubei Province, China. It is featured by pneumonia-like symptoms. The virus spread exponentially, ensuing in an outbreak all through China and the world. Subsequently, on March 11, 2020, World Health Organization announced it as a world-wide pandemic.[1] The pandemic spread in such a way that it affected wide variety of sectors. Since the start of epidemic many fields have been closed including transport, trade, and education. The process has disrupted medical education also.[2]

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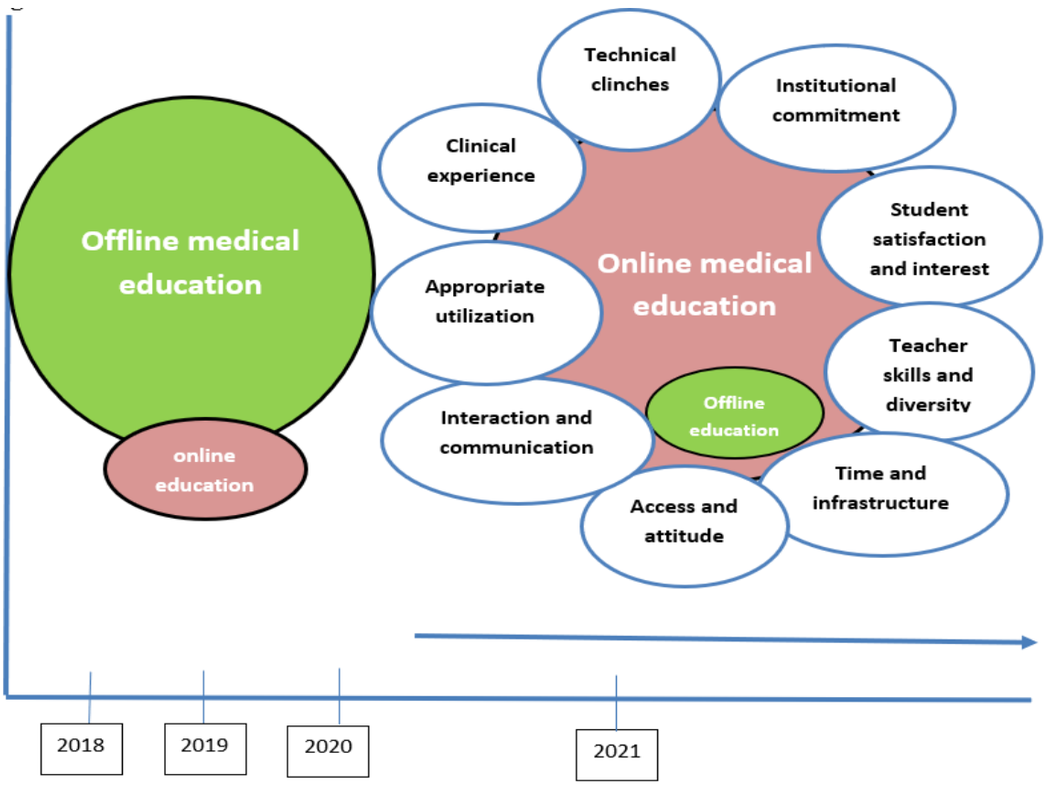
The universities or institutes have swiftly adapted to the system of online education via various web-based platforms like zoom, Google meet and other learning management system. "Electronic (e) or online learning can be defined as the utilization of electronic technology and media to deliver, support and develop both learning and teaching and includes communication between learners and teachers utilizing online content". Online learning can deliver students with "easier and more effective contact to a wider variety and greater amount of information".[3,4] Any effective online education should have major five elements which are student satisfaction, learning effectiveness, faculty satisfaction, student access, and institutional cost-effectiveness.[5]

The medical education unlike other field of education needs to be topic specific and to have the involvement of all domains including cognitive, affective, psychomotor and communication. The need for the online education is necessary in this current situation but the way and the effect of it on medical students differs. The mere absence of patients from learning makes the teaching monotonous which makes the education more unsatisfactory and indifferent. The area of medical education which is at grey during the online education is building clinical experience, which may have evolved as a potent cause of barrier to satisfy the students. Many colleges or universities adapted the idea of live online lectures or pre-recorded lectures with various assessment modalities. These modalities may or may not be a success but the need for the hour makes the students and teachers adapt to these and so to sustain the medical curriculum.[6-8] The figure below shows the various elements needed to be considered particularly in online medical education before and after the COVID Pandemic. This study tries to analyse the perception of medical students about online education.

Figure 1: Elements in online medical education



Objectives

To assess the perception about online education among medical students across India.

Materials and Methods

We conducted a cross-sectional study using web-based platforms among medical students during July- August 2021. The data was collected from among the medical students who can be contacted via social media platforms and email. Ethics committee approval and informed consent was taken before the start of the study.

The sample size was calculated using the anticipated 50% have level of satisfaction and after applying the formula, $n= Z\alpha^2PQ/d^2$ [$Z\alpha$=1.96, P=50, Q=50,d=5], the sample size came up to 384. The study collected data from 578 subjects. The questionnaire was pretested on 15 medical students who were later excluded from the study and analysis. The internal consistency of the study questionnaire was evaluated by calculating the Chronbach's alpha. The values were 0.84 for advantage -disadvantage for online section of the study.

The objective was assessed using a questionnaire made up via the G suite application and disseminated via social media platforms and other applications. The questionnaire contains parts- socio-demographic profile including age, gender, place of residence, type of college and different modes of usage of devices. The next part had advantages and disadvantages, teacher's quality, hindrances and suggestions about online education. The advantages (11 responses) and disadvantages (13 responses)of online education were reported by the respondents in Likert scale [strongly agree, agree, neutral, disagree and strongly disagree]. The advantages responses is scored such as strongly agree scored 5 and strongly disagree scored 1 and inverse holds for disadvantages. The higher the score in both sections holds a highly positive perception regarding online education. The data collection was made anonymous without collecting any link to the respondent like name and email and participants provided informed consent to participate. The data collected through google forms using snowball sampling technique and was disabled after a month of the initiation.

The data collected was entered in Microsoft Excel and analysed using SPSS version 23 software. The descriptive analysis was analysed using frequencies, mean, standard deviation and proportions. Tests of association were performed using appropriate tests like Chi-square test, independent t test and One-way Anova test for the bivariate analysis.

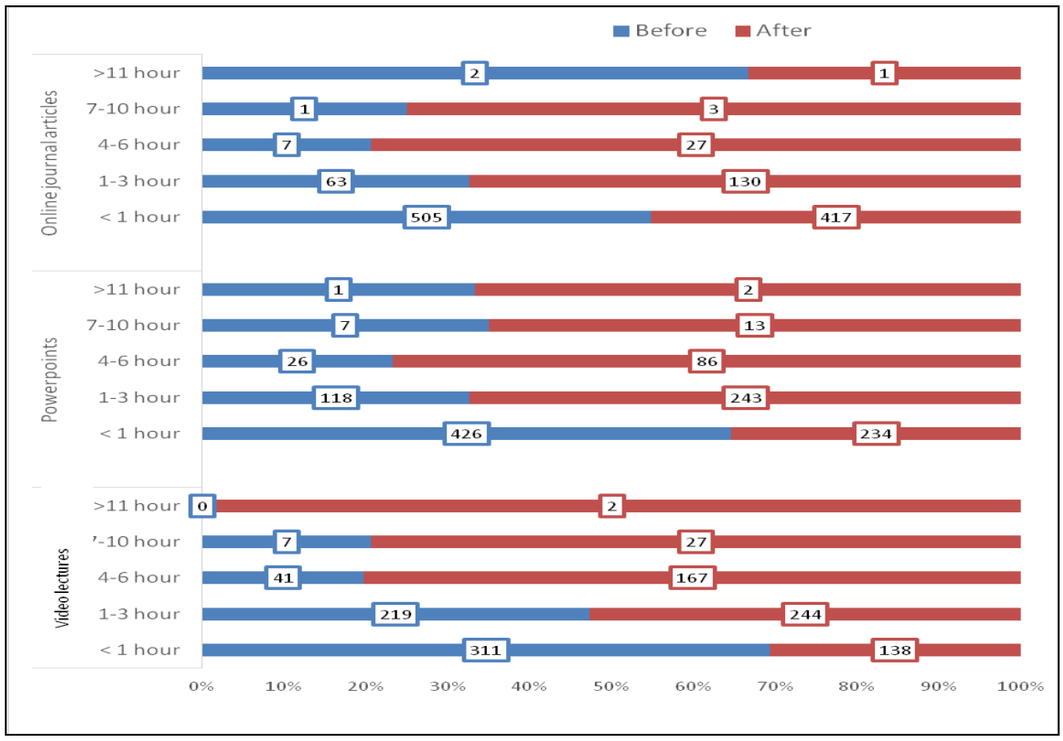
Results

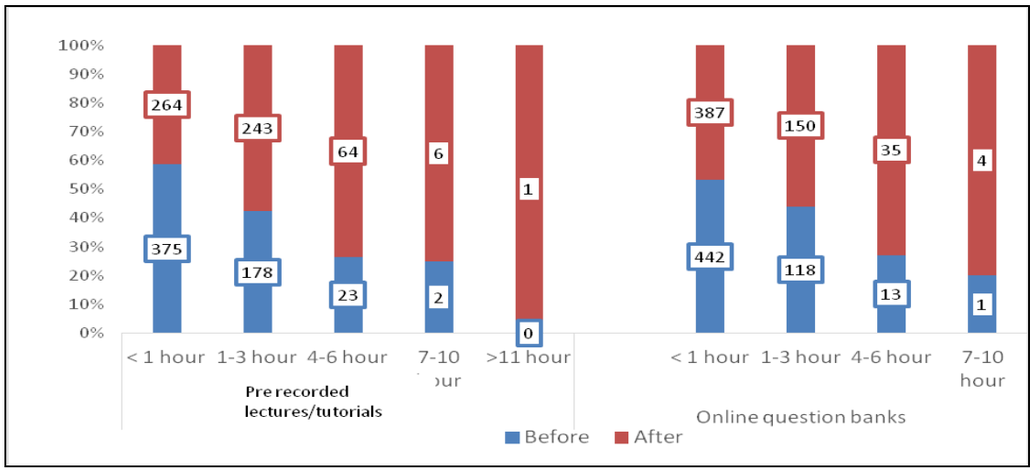
The study collected data from 578 students. The mean (standard deviation) age of the population was 20.54 (1.70) years with a minimum of 18 and maximum of 36 years. Out of the subjects 386 (66.8%) were females and 192 (33.2%) were males. Among the students 123 (21.3%) belonged to first year, 181 (31.3%) belonged to 2nd year, 176 (30.4%) in 3rd year and 98 (17%) in 4th year. In the study 413 (71.5%) responses were from private college and 165(28.5%) from government medical colleges. In the study 449 (77.7%) students were from the state of Tamilnadu, 83 (14.4%) from Kerala, 36 (6.2%) from Karnataka and 10 (1.7%) from other states including Andhra Pradesh, Puducherry and West Bengal.

The figure (Figure 2) below shows the time spending on various teaching methods before and after the advent of online classes. In the study most of the subjects spend less than an hour for video lectures 311 (53.8%), Power Points 426 (73.7%), online journal articles 505 (87.4%), pre-recorded lectures/tutorials 375 (64.9%) and online question banks 444 (76.8%) before the advent of online education. After the onset of online classes, the time increase to 1-3 hours for most of the subjects in these modalities video lectures 244 (42.2%), Power Points 243 (42%), and pre-recorded lectures/tutorials

243 (42%). There is a significant increase of subjects in the time spending for various teaching methods after the advent of online classes [Fischer's exact test, p value<0.05]

Figure 2 : Time spend before after the advent of online classes





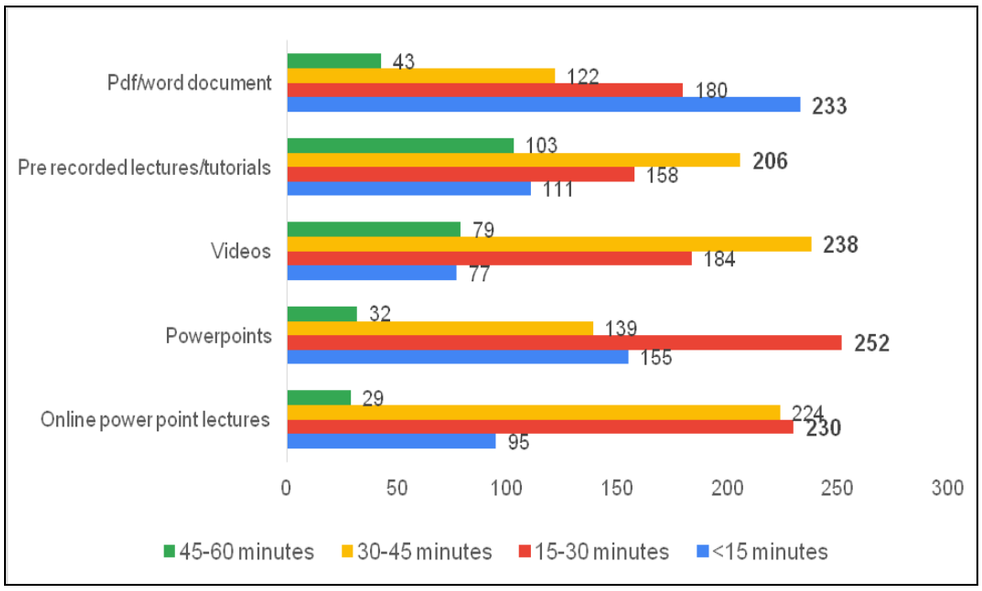
In the study most used online modality among live online lectures, notes in word or PDF format, recorded videos, uploaded PowerPoint, most of the subjects depended on live online lectures 428(74%). Among these most useful was reported as recorded videos 253 (43.8%) followed by live online lectures 234 (40.5%) and the preferred one was recorded videos 251 (43.4%) followed by live online lectures 225 (38.9%).The study collected data on mode of devices used for online education which is displayed in the below table. Most of the subjects 369 (63.8%) always used

smartphones for online education and tablets 426 (73.7%) and desktops 493 (85.3%) were never used by most of the subjects (table 1)

Table- 1: Mode of devices used for online medical education

Particulars	Always		Never		Occasionally		Often		Sometimes	
	No.	%	No.	%	No.	%	No.	%	No.	%
Smartphone	369	63.8	13	2.2	52	9	122	21.1	22	3.9
Laptop	78	13.5	244	42.2	118	20.4	72	12.5	66	11.4
Tablet	41	7.1	426	73.7	50	8.7	38	6.5	23	4.0
Desktop	9	1.7	493	85.3	37	2.8	16	2.8	23	4.0

The below figure shows the time the students able to concentrate on the modes of online education. Figure 3: Minimum concentration time for the modes of online education

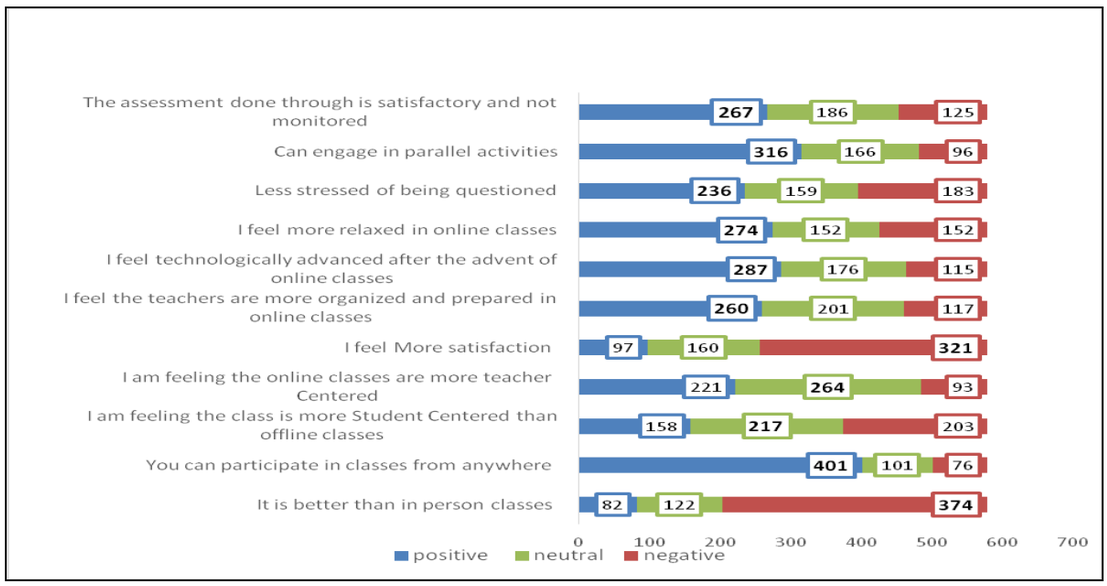


In the study most of the subjects could only concentrate in an hour class for about 15-30 minutes for online PowerPoint lectures 230 (39.8%) and power points 252 (43.6%). Most of subjects could concentrate for 30-45 minutes for videos 238 (41.2%) and pre-recorded lectures/tutorials 206 (35.6%). For PDF/word document most of the subjects 233 (40.3%) could concentrate straight for less than 15 minutes.

The advantages and disadvantage responses were analysed using scores. The mean (standard deviation) for advantage responses was 34.50 (6.12) and for disadvantage responses was 28.66 (8.69). The minimum response for advantages and disadvantages was 11 and 13 respectively with the maximum being 55 and 61 respectively. The scoring of advantage and disadvantage of online medical education showed significantly higher score among private medical college students [33.52 (6.09) vs. 34.89 (6.09) and 26.73 (8.09) vs 29.44 (8.82)][independent t test, p value <0.05].

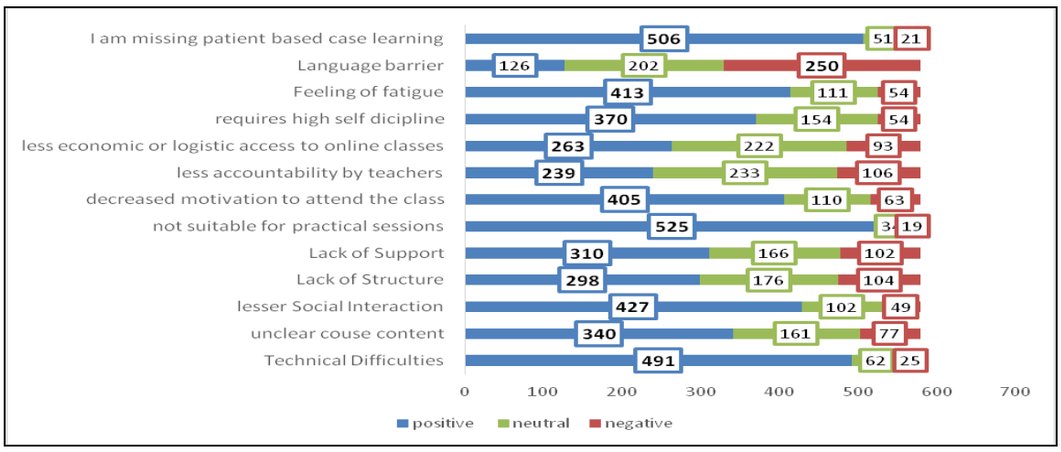
The scoring of advantage and disadvantage of online medical education among the different year medical students showed that 3rd year had significantly higher score among the different year students [35.35 (5.93) and 30.09 (9.18), One-way Anova, p value <0.05].

Figure- 4: Responses regarding advantages of online education



The advantages which mostly reported by students include ease for participation from any place, increased organization for teachers, technological advancement, relaxed environment, less stress of questioning, parallel activities engagement and satisfactory assessment.

Figure-5: Responses regarding disadvantages about online education

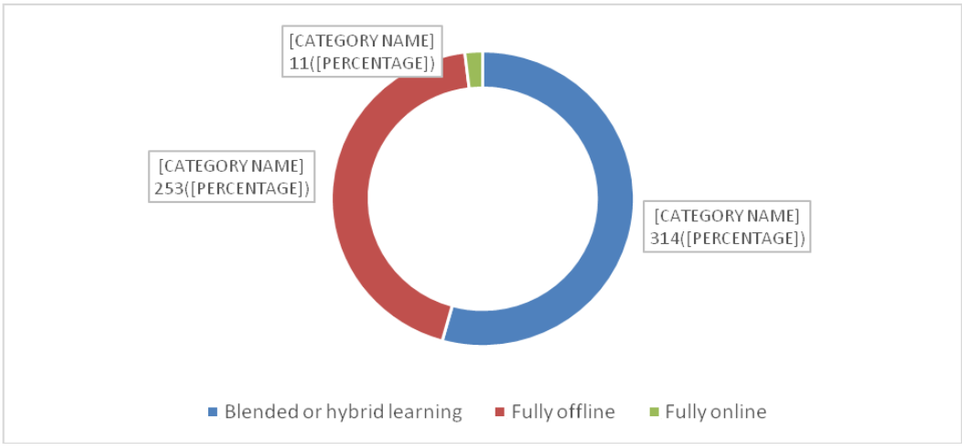


The questions about teacher's training showed that most of the students agreed that teacher's need training for it (38.8%) and online class quality depends on teacher's quality (40.7%). The study showed most of the students 468 (81%) agreed that teachers are putting an effort for online class teaching. About the easiness of teacher in assessments showed that 218 (37.7%) students gave a neutral response.

The disadvantages reported include fatigueness, difficulty in terms of economic or logistic access, need of high self-discipline, need for motivation and decreased accountability by teachers, lack of support and structure, reduced social interaction, absence of practical sessions, unclear course and difficulties technically.

The study showed that the reasons which at least once have hindered online education was poor internet connectivity 96.37% , electric supply disruption 85.81%, lack of knowledge in handling the devices 49.65% and disturbances at home 89.10%.The study showed that the students used the tools for online education at least once in these proportions- Google classroom 91.18%, zoom app- 44.6%, Google meet- 94.5%, WhatsApp- 71.3%, Skype- 12.8% and YouTube-61.2%. Most of the students agreed that they gained good knowledge on key concepts about the topic- 39.79%, improved communication skills- 28.89%, revision and seeking expert guidance-33.05% ,prompt clarification facility-33.05% and anytime access to materials-57.09%.The below figure showed the preferred mode of education reported by the medical students.

Figure -6: The preferred mode of education



The study showed that most of the students 314 (54%) preferred blended or hybrid learning in the future.

Discussion

The study assessed the perception of medical students about online education. The students have started spending more time in various teaching methods after the advent of online classes. In the study most used online modality reported was live online lectures and most useful and preferred was reported as recorded videos. The various teaching methods including video lectures, Power Points, and pre-recorded lectures/tutorials were increasingly used by the students in terms of time spent during the online education. In the study students reported that maximum time they can concentrate for videos and pre-recorded lectures/tutorials, the minimum time was reported for pdf/word documents. Other studies also showed that students increasingly utilized PowerPoint lectures and pre-recorded or on time videos in many studies.[6, ,8 -12] The visual impact of the online materials have made these methods more acceptable among the students. The usual aspects which make a student more inclined towards online learning would be its ease in utilization and its autonomous usage.[13-15]

Most of the subjects 369 (63.8%) always used smartphones for online education. This holds true with other studies [9,16 & 17] as the most preferred gadget due to its character of handiness and comfortable in accessing compared to any other gadgets.[18-21] The study showed students mostly use Google suite application like Google class room and meet for the education along with Whatsapp and YouTube. This holds like other studies where along with Google apps, zoom also was used as an online mode and also certain institutions manage with own learning management system. [8, 22, 17] The advantages which mostly reported by students in the study include ease for participation from any place, increased organization for teachers, technological advancement, relaxed environment, less stress of questioning, parallel activities

engagement and satisfactory assessment. The disadvantages reported include fatigueless, difficulty in terms of economic or logistic access, need of high self-discipline, need for motivation and decreased accountability by teachers, lack of support and structure, reduced social interaction, absence of practical sessions, unclear course and difficulties technically.

Many studies have discussed the challenges and benefits of online education. Studies done in South India and Poland among medical students showed that main benefit of online education was learning at leisure compared to any time, flexible location and access from anywhere.[17, 8, & 23]

Studies done in Nigeria[24] and India[17] showed that lack of regular electricity supply and cost of internet subscription were biggest challenge for online education. A qualitative study done in Saudi Arabia shown that online sessions were saving time with enhanced utility of time in attending the sessions, but there were some methodological, content perception, technical, and behavioural challenges.[10] Study done in Norway shown that the challenges were lack of social interaction, unfit housing situations with inadequate data bandwidth, and an general sense of decreased motivation and effort.[18] Study done in Sudan and Poland showed that unfamiliarity with online learning system, technical support restriction and time flexibility in case of technical problems during online exams, and face-to-face interaction lacking were all challenges reported among medical students.[16, 23]

The study have reported few suggestive measures in improving the online education for example prompt clarification facility, anytime access to materials, extra sessions for technical knowledge and content clarity. The similar findings were reported by other studies [11, 25] where students suggested that suitable content, connectivity, recorded videos along with proper follow up during sessions would make online classes on par with offline one.

The study is limited with the non-inclusion of trainer or teacher perspective. The study would have been better with an in depth of view from the student and trainer side. The approach of students was through online so the constraint of technical and intelligence skill may act as limitation in reporting. The pure perception of online education cannot be assessed as the students were exposed to these online formats way before we collected the data and mix of responses due to the collection of data during the second wave (delta wave) in India.

Health being a state of physical, mental and social wellbeing and to lead a socially and economically productive life. The pandemic made an impact on the different aspects of life among medical students including their education and day to day living activities. The current situation showed the initiation of a new method of medical education where the institutions and teachers have developed many novel techniques to convey the knowledge from the trainer to student. The challenges faced by the students may be temporary and these situations should make the students resilient and compatible to accept and adapt fast. The institutions should foresee and prepare a schedule from the initial years to technically evolve the students. The students should adapt and contemplate such a way that education matters from wherever it comes, and we should gather its merits in whatever form it delivers.

Conclusion

The study have shown that students have been spending more time in videos, Power Points and pre-recorded lectures like online methods since the start of online education in comparison to word or PDF documents. The advantages which mostly reported by students in the study include ease for participation from any place, increased organization for teachers, technological advancement, relaxed environment, less stress of questioning, parallel activities engagement and satisfactory assessment. The disadvantages reported include fatigueness, difficulty in terms of economic or logistic access, need of high self-discipline, need for motivation and decreased accountability by teachers, lack of support and structure, reduced social interaction, absence of practical sessions, unclear course and difficulties technically.

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