RESEARCH ARTICLE

PERCEPTION OF E-LEARNING AMONG PHYSIOTHERAPY STUDENTS DURING THE COVID-19 PANDEMIC

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Manuscript Info

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Abstract

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Introduction: With a lockdown period with COVID-19, most physiotherapy colleges all over Gujarat took to some or the other mode of e-learning. Social distancing protocols had to be enforced to reduce spread of infection, thereby increasing the need of e-learning. E-learning techniques entail benefits and challenges both, and may also pose technological difficulties. In clinical professions like physiotherapy education, e-learning techniques can be demanding and may hinder in achieving desired outcomes among the students. The present study was conducted with an aim to understand the opinions, preferences and problems of this somewhat new form of teaching-learning methods among physiotherapy students of Gujarat.

Method: A Google survey form was generated and circulated among physiotherapy students of Gujarat. Both male and female students studying physiotherapy in any year - both undergraduate and postgraduate, were included in the study. Students following internship were excluded. Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 16.

Results: 2025 responses were obtained from Gujarat. 1552 students (76.6%) had not taken any online courses in the past. No online lectures had been attended in the past by 1126 students (55.6%). A majority of 1188 students (58.7%) preferred audio-video conferencing as the mode of e-learning. When asked about possessing all the technologies required for attending an online class e.g. internet supporting mobile phone, laptop, desktop, good internet services, etc., there were 1758 positive responses (86.8%). 1712 students (84.5%) said they were comfortable with downloading and installing various e-learning software or apps on their computer or phone. 1415 students (69.9%) were comfortable spending several hours on their phone or computer. 1517 students (74.9%) enjoyed e-learning. When asked about their preference of e-learning to classroom learning, 1140 students (56.3%) responded positively. 715 students (35.3%) responded that they were comfortable with not meeting their classmates in person.

Conclusion: 86% students found e-learning to be a possibility in physiotherapy in India and majority of the students preferred e-learning

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to classroom learning. However, some of the students also found some technological difficulties too. E-learning may be developed as an alternative to classroom learning after removing the existing barriers and insufficiencies.

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Introduction:-

Electronic communication is becoming increasingly easy nowadays and is also very common. The availability of cheap data and a large number of applications for communication purposes has made virtual communication the need of the hour. E-learning is a teaching technique that uses the internet for communication between lecturers, teachers and students. Nichols has defined E-learning as "the use of various technological tools that are either Web-based, Web-distributed or Web-capable forthe purposes of education." (1) The American Society forEducation and Development has defined e-learning as "any form of information transmitted, facilitated orprovided by electronic technologies in order explicitly to support the process of learning." (2)

E-learning has been coming up as one of the newer methods of teaching in the modern day education system. Developed countries have been using this mode of teaching-learning since quite some time. E-learning provides several advantages such as laying out opportunities for anyone who wants to gain knowledge to gain it without being physically present at the university or college. Despite advantages, using e-learning has many challenges such as the learners must be persistent, requires such amount of time to read the notes, read the discussions that have been uploaded to the system, all the while keeping the learners motivated to do the assignment. (3) Interfaces such as video conferencing and virtual classrooms make real time synchronous communication possible between teachers and students.

The current outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has affected almost all the nations of the world and has been termed as a pandemic. Coronaviruses are large single stranded, positive, enveloped viruses that affect animals as well as human beings. They made their transition from animals to human beings somewhere around late December 2019. The most commonly diagnosed clinical sign for the Coronavirus disease (COVID-19) disease is pneumonia. Other signs include gastrointestinal symptoms, neurological symptoms, etc. The mean and median incubation periods of COVID-19 are 5 and 3 days respectively and it ranges from 0-28 days. In symptomatic individuals, the symptoms manifest usually less than a week later, which gives a lot of chance for the infection to spread since the incubation period is large. Implementation of travel restrictions has resulted in lowering of cases and control of spread of infection as seen in China. (4) Following such observations several nations of the world also started implementing restrictions and enforcing lockdowns. Social distancing protocols were put into enforcement to avoid the spread of infection.

The World Health Organization (WHO) Emergency Committee evaluated the growth rates in countries like China, Italy, Spain, etc. and declared an international health emergency. (5) Several countries around the globe went into nation-wide lockdowns which brought the daily routine lives of the people to a halt. With the COVID-19 pandemic, the world has been struggling with daily routine life. In this struggle, the education sector also has suffered immensely. Schools and colleges were forced to shut down during the midst of the academic year. Students could not finish their courses due to failure of the offline mode of education. Using newer modern technologies, the education sector shifted from an offline mode to and online education mode. E-learning was taken up by several schools and colleges for various activities of education.

Similar to several other schools and colleges across the globe, many physiotherapy colleges of Gujarat had been using electronic communication since some time. For students, availability of lectures online has also become an easy source of knowledge. In line with the opportunities that technology offers, many online courses and other e-learning experiences have undergone a rapid expansion in the sector of higher education. Classes once delivered face-to- face are often replaced by online activities and discussions. But in India we still face some hurdles to using this as a regular medium to exchange knowledge. Moreover, the health profession educational fields, including medical, dental, physiotherapy and nursing education, demand high-quality educational methods. In commerce, software, and business schools and universities, e-learning is a common mode of teaching and is known to have been successful in achieving the desired outcomes. Also, differences may exist between individuals in relation to

their general skills, attitudes and preferences for processing information, comprehension and novel practical application. (6)

Various newspaper articles have cited the limitations of the online education or the E-learning system. Limitations like inability to use by students with disabilities, poverty, linguistic limitations, etc. have been mentioned by such articles. (7, 8) Though such limitations have been cited, very few alternatives for e-learning exist. The efficient and successful implementation of e-learning depends on the acceptance by students. Several studies have also cited the positive attitude of students towards e-learning. (9-14) Thus, understanding the perspectives of students towards e-learning becomes important so that its usage, efficacy and limitations can be utilized for meaningful inferences in modes of education.

In these times of COVID-19, the need for e-learning seems increased. Schools and universities, both are increasingly using this mode of teaching in such times. However, there is little research comparing students' experience and learning in these two modalities. Various technical, technological, psychosocial capabilities and growth to cope with this trend will enable to improve standards of education during such trying times. The aim of the present study was to gather data about how students feel regarding e-learning and their opinions regarding the advantages and disadvantages of e-learning among physiotherapy students.

Method:-
An observational study was conducted among physiotherapy students of Gujarat using convenience sampling. A Google survey form was generated and circulated among the physiotherapy students. The form was a self-generated form which was given to five university teachers in physiotherapy who approved of the content of the questionnaire with few modifications. The form was then distributed among 25 students for any addition, deletion or modification of questions. After final approval of the content of the questionnaire by the authors, the forms were circulated among students through the principals of the colleges via various different social media portals.

Male and female, undergraduate or postgraduate students studying physiotherapy in any year were included in the study. The students had English as a medium of instruction. Students following internship were excluded. Students not willing to participate were excluded. Participating in the survey was taken as consent. 2025 students completed the study.

Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 16.

Results:-
2025 responses were obtained from Gujarat – one response for each student. Of these 2025 students, the academic year of studying is described in table 1.

**Table 1:-** Distribution of students according to academic year.

Academic year	Number of students	% of students
First year BPT	517	25.5
Second year BPT	481	23.8
Third year BPT	481	23.8
Final year BPT	503	24.8
First year MPT	25	1.2
Second year MPT	18	0.9

Previous attendance and experience of online courses and lectures of the students is shown in table 2.

**Table 2:-** Attendance of online lectures and courses by the students.

Attendance of online teaching	Yes (%)	No (%)
Taken online courses in the past	473 (23)	1552 (77)
Attended online lectures in the past	1126 (56)	899 (44)

Graph 1 shows the preference of mode of e-learning. The options available were audio and video conferencing, virtual classrooms, discussion forums, webinars, e-mails and chats, self-paced online courses, message boards and a combination of interactive and non-interactive classes.
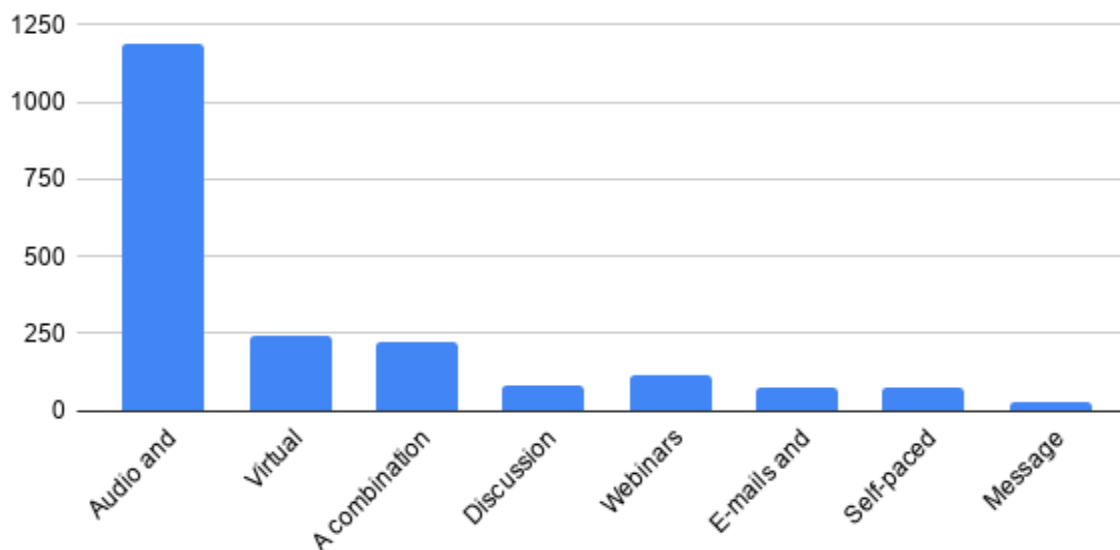
Graph 1:- Preference of mode of e-learning among students.

Preference regarding the online platform for e-learning is shown in graph 2.
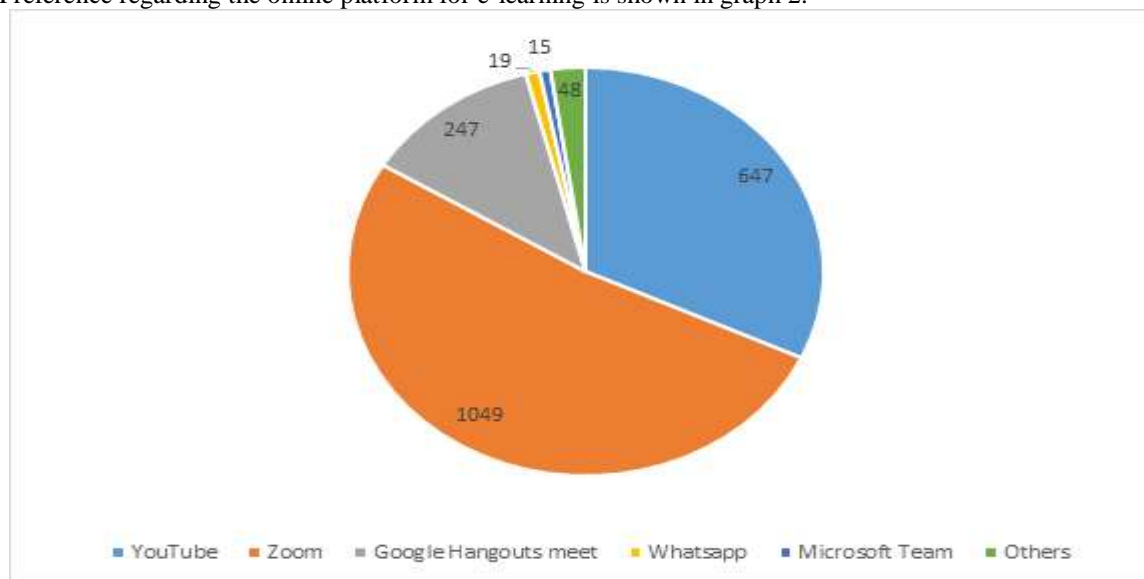
Graph 2:- Preference of online platform among physiotherapy students.

Table 3 presents the data regarding the attitude of physiotherapy students towards e-learning.

**Table 3:-** Attitude of physiotherapy students towards using e-learning.

Attitude towards e-learning	Yes (%)	No (%)
Possess all technologies required	1758 (86.8%)	267 (13.2%)
Comfortable with downloading and installing software and applications	1715 (84.5%)	313 (15.5%)
Comfortable spending several hours on phone or computer	1415 (69.9%)	610 (30.1%)
Enjoying e-learning	1517 (74.9%)	508 (25.1%)
Preferring e-learning to classroom learning	1140 (56.3%)	885 (43.7%)
Comfortable not being able to meet classmates	715 (35.3%)	1310 (64.7%)

The perception of benefits or advantages of e-learning is shown in graph 3.
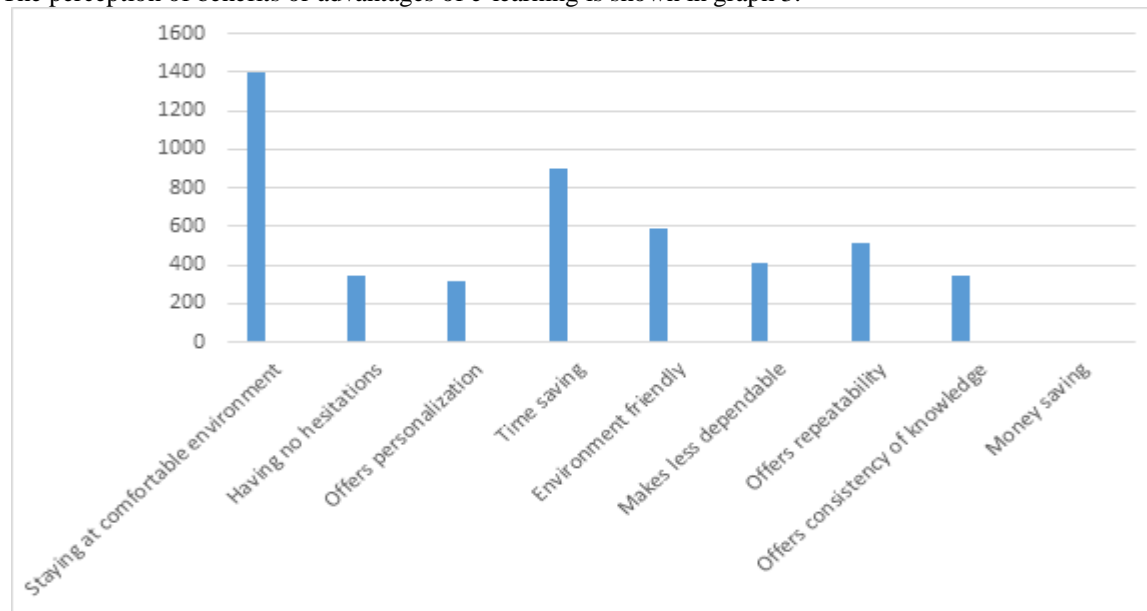
Graph 3:- Benefits of e-learning according to physiotherapy students.

Graph 4 shows the perceptions of physiotherapy students regarding the disadvantages of e-learning.
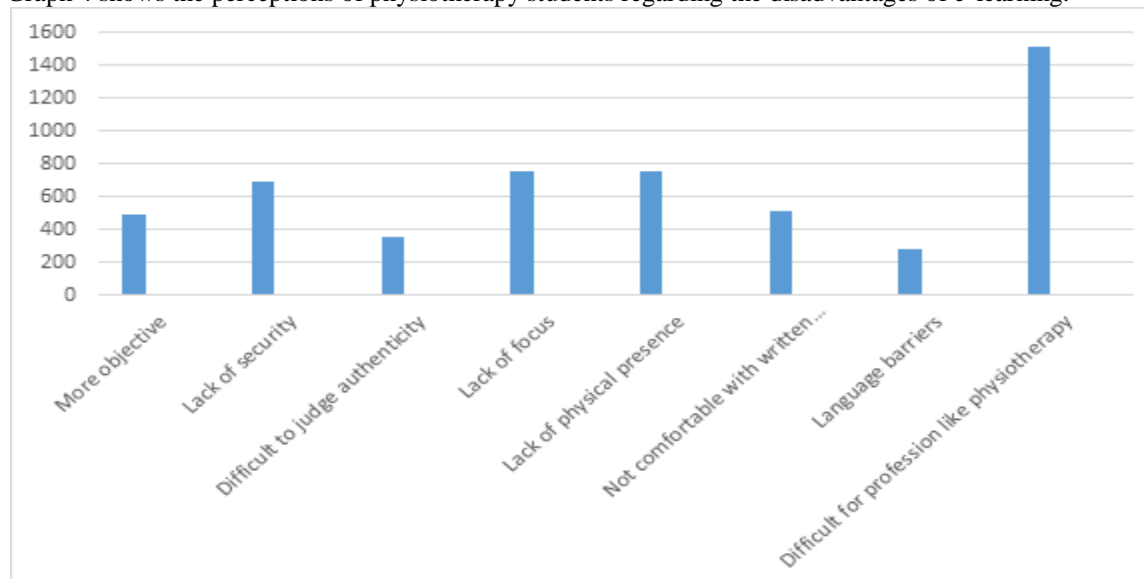
Graph 4:- Perception of physiotherapy students regarding disadvantages of e-learning.

1748 students (86.3%) found e-learning to be a possibility in India whereas, 277 students (13.7%) did not think so.

Discussion:-

2025 physiotherapy students of Gujarat completed the study conducted to find the attitude and perception towards online learning. Of these 2025 students, 517 students (25.5%) belonged to first year Bachelor of Physiotherapy (BPT), 481 students (23.8%) belonged to second year BPT and the same number of responses were obtained from third year BPT as well, 503 students (24.8%) responded from final year BPT, 25 students (1.2%) responded from First year Masters of Physiotherapy (MPT) and 18 students (0.9%) from second year MPT. Thus there was equal representation from all the four years of undergraduate with less representation from the postgraduate students.

1552 students (76.6%) had not taken any online courses in the past, whereas 473 students (23.4%) had. No online lectures had been attended in the past by 1126 students (55.6%), whereas 899 students (44.4%) had attended online

lectures in the past. These findings are consistent with a previous study which showed that e-learning systems are usually preferred by lecturers and students for uploading and downloading lecture notes only and not as a platform used for active education. (15) A study by Ghanizadeh et al found that 78.5% students used personal computers for e-learning at home, of which the majority had been using computers since several years. However, even though 50.8% students used computer programs regularly, only 30.7% students were found to be familiar with e-learning and only 21.3% had been using it regularly for the purpose. This was in spite of multimedia and internet being made available in the university and being used by 57.6% students for e-learning. The students, though, agreed that e-learning was a useful tool in medical education and should be made more prevalent. (16)

In the present study, a majority of 1188 students (58.7%) preferred audio-video conferencing as the mode of e-learning, 245 students (12.1%)   preferred virtual classrooms, 222 students (11%) preferred a combination of interactive and non-interactive class, 115 students (5.7%) preferred webinars, 84 students (4.1%) preferred discussion forums and groups72 students (3.6%) preferred e-mails and chats,71 students (3.5%) preferred self-paced online courses, and 28 students (1.4%) preferred message boards.

Preference regarding the online platform for e-learning was responded with Zoom by 1049 students (51.8%), YouTube by 647 students (32%), Google Hangouts meet by 247 students (12.2%), Whatsapp by 19 students (0.9%) and Microsoft team by 15 students (0.7%). 48 students (2.4%) preferred other online platforms like Webex, Cisco, etc. Paechter et al in 2010 concluded that other than the online platform used, the course design implemented is also important for the students. The online platform gives the students an opportunity to be interactive, communicative and makes them able to access learning resources more effectively. Hence, while designing a course based on e-learning, efforts should be made to make the course easy to use, student-friendly and flexible. This may aid the students to use the platform more and will also try to reduce the negative expectations they may have from e-learning. (17) In the present study though, details regarding the online courses or lectures attended previously by the students were not assessed.

When asked about possessing all the technologies required for attending an online class e.g. internet supporting mobile phone, laptop, desktop, good internet services, etc., there were 1758 positive responses (86.8%) and 267 negative responses (13.2%). 1712 students (84.5%) said they were comfortable with downloading and installing various e-learning software or apps on their computer or phone and 313 students (15.5%) said they were not comfortable doing so. 1415 students (69.9%) were comfortable spending several hours on their phone or computer, whereas 610 students (30.1%) were not. 1517 students (74.9%) enjoyed e-learning and 508 students (25.1%) did not enjoy it. The skill of a student in using technology is a significant predictor of their attitude towards e-learning. (18) If the students are not skilled at using technologies, they should be given basic training about such technologies before venturing into e-learning.

When asked about their preference of e-learning to classroom learning, 1140 students (56.3%) responded positively and 885 students (43.7%) responded negatively. 715 students (35.3%) responded that they were comfortable with not meeting their classmates in person and 1310 (64.7%) responded that they would rather meet their classmates. These findings are consistent with those achieved by Warneck and Pearson in 2011 while studying the perception of e-learning to enhance the acquisition of consulting skills among medical students. The students perceived an e-learning package to be a useful and enjoyable resource. They perceived that the e-learning package was effective in improving their knowledge and performance related to consultation skills. Also, the students also found the e-learning package to be a complement to face-to-face teaching. However, in the present study the physiotherapy students perceived that e-learning could be used as an alternative to classroom teaching which demonstrates the difference in opinion among the medical and physiotherapy students. This difference in opinion may be due to the level of practice required in both fields. Though both medicine and physiotherapy are practical-based professions, the level of practice required in medicine is much higher than that in physiotherapy, which may lead to a difference of opinion. (19) The students in the present study reported very few technological difficulties, which can be considered as a positive factor as the success of any e-learning program depends on technological accessibility and the possession of a good Internet connection. (20) The students in the present study also reported no difficulties with the downloading and installation of the software or application or using of the application which can also be considered as a positive factor since students require technological skills like basic and advanced computer using skills, multimedia management skills, online management skills and time management skills to use any e-learning program. (20) As reported by Ghanizadeh et al, technical problems like poor connection are the most important limitation related to internet use among medical students. In the present study, though, the students did not report

such issues. The present study was conducted in the Gujarat state of India, and most of the students resided in urban areas where the internet connection and data network are much better than other locations of the world, leading to better connectivity and higher usage. (16) Similar conclusions were made by Goh and Clapham who postulated that the relevance and strength of the content provided and the learning outcomes are essential elements of a successful e–learning program. Not only this, but also, the correct technical infrastructure like good user interface, design, broadband speed, Information technology facilities, technical support etc., and the overall learning strategy are also key elements that determine the success of an e-learning program. (21)

Regarding benefits of e-learning over classroom learning (students could choose multiple responses), 1399 students (69.1%) felt they could stay at their comfortable environment and learn, 896 students (44.2%) found e-learning to be time saving, 591 students (29.2%) found it to be environment friendly as it is paperless, 510 students (25.2%) thought it offered repeatability, flexibility and convenience, 407 students (20.1%) felt less dependable on anyone,345 students (17%) said they were introverts and hesitated asking questions in class and e-learning provided them an opportunity to ask questions without any hesitations, 398 students (19.7) found it to be money saving, 349 students (17.2%) found a consistency of knowledge with e-learning and319 students (15.8%) felt that e-learning offers personalization and it seems like a personal one-on-one session than a group class.

Regarding disadvantages of e-learning (students could choose multiple responses) 759 students (37.5%) felt it may lack focus as sometimes the infrastructure becomes too convenient and attention may get diverted, 759 students (37.5%) found the lack of physical presence a disadvantage, 692 students (31.1%) found concerns over the lack of security with many sites, 512 students (25.3%) were not comfortable with communicating in writing, 495 students (24.4%) thought it was more objective rather than subjective, 362 students (17.9%) said it was difficult to judge the authenticity of the resource person and the content, and 286 students (14.1%) thought that language barriers may exist. A majority of 1509 students (74.5%) responded that it becomes difficult for a profession like physiotherapy to use e-learning since the learning is more practical based than theory based. The lack of human interaction has been cited as an important factor for a better performance in education. The student needs to interact with peers and teachers in order to accomplish assignments and score better. With a socially isolated environment, the student faces lack of motivation and has to find internal resources of motivation and stimulation. (22)

The perceived advantages and disadvantages of e-learning by students influence their attitude towards e-learning greatly. Advantages like schedule flexibility, reduced costs and being time saving whereas disadvantages like technical inexpertise, unavailability of certain technologies and lack of human interaction have already been cited by past authors. (22) The present study also found the lack of human interaction as a disadvantage but in a crisis like the COVID-19 pandemic where human interaction needs to be restricted and there are no other available alternatives, e-learning can be used as a viable option.

Warneck et al reported various benefits of using an e-learning package. They reported benefits in participants' confidence and their style and structure of consulting skills after using the e-learning package. They also recommended the use of e-learning in a more blended learning environment where e-learning may support face-to-face teaching while also allowing flexibility in the delivery of medical education. (19)

1748 students (86.3%) students found e-learning to be a possibility in India whereas, 277 students (13.7%) did not think so. This preference of the physiotherapy students can be regarded as an indication of changing times as the students are becoming more aware of the changes that digital technologies are bringing to the education sector by impacting the learning process, along with the entire world. It is convenient for the students to make such a choice as they are well equipped with the use of technology. The availability of digital resources and the fact that the students are already using digital technologies for the purpose of learning have also impacted this perception regarding the possibility of e-learning being an option in a developing country like India. (23) Similar findings were concluded by Rhema and Miliszewska through a study conducted among students of Libya. They concluded that students have a positive attitude and willingness to engage in e-learning which may suggest great potential for future e-learning initiatives in Libya. (18)

A few students (26%), however, also thought that e-learning cannot replace the classroom lectures. This is in accordance to the findings of Ghanizadeh et al, who also concluded that 75.1% students believed e-learning to be a complementary method of teaching in medical education rather than a stand-alone method. (16)

Another study by Chowdhury et al found that computers and the internet are rapidly becoming a vital component of medical education in several parts of the world as they can help in improving the quality of care, enhancing the use of evidence based treatment and maintaining an updated knowledge. (24)

A study conducted in Punjab University, India also concluded similar findings that students have great knowledge about the latest tools and models of e-learning. They have a high rate of internet access. The study also suggested that the education sector can now think of applying e-learning as an education format for students. (25)

In spite of the students showing such great interest and having positive reviews about e-learning, it can never be forgotten that physiotherapy like the other medical and paramedical subjects is a practical based field of profession where clinical practice is equally important to theoretical knowledge. With e-learning, the theoretical aspects of the subject may be covered, but it becomes rather difficult to inculcate the same experiences that one may have with a practical face-to-face exposure.

In the future, other elements that can give impact on e-learning expectations could be considered, like the content of the lecture or course or the qualities and experience of the teacher, as it can contribute to the successful implementation of e-learning. Students' satisfaction can be measured. One cannot assume that the mere existence of e-learning activities and materials supporting a face-to-face experience of learning will improve the quality of the experience. How students perceive and use the activities and materials represent one of the keys to unlocking the full value of e-learning in the student learning experience at university. Future studies regarding the actual knowledge gained from an e-learning program should be conducted.

The study included a large number of students from all the different academic years from all over Gujarat. But, the perception of the students about the quality of lectures available was not assessed.

Conclusion:-
E-learning is an up and coming area of education in India. With the tech-savvy nature of the modern day students and the availability of all required digital resources, e-learning is now becoming prevalent in India, particularly in recent times. The study concluded that the majority of the students find e-learning to be a possibility in India. Staying in their own comfortable environments is deemed as the main benefit of e-learning whereas the practical aspect of the profession of physiotherapy may limit the application of e-learning in the field of physiotherapy education.

Acknowledgements:-

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