TELEHEALTH AND TELEMEDICINE, CHALLENGES, OPPORTUNITIES, AND ITS IMPLEMENTATION: AN EMERGING GLOBAL RESEARCH AGENDA

Muhammad Soaib Said[1*], Faryal Jahan[2], Muhammad Noumann Arif[3], Iqra Saleem Naz Babari[4], Maysoon Raed Bassam Alnajdawi[5], Ishfaq A Bukhari[6], Shafiq Ali Shah[7], Izharullah[4], Tayyaba Ghazanfar[8], Asif Mehmood Hashmi[4]

[1*]Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia
[2]Shifa College of Pharmaceutical Sciences, Shifa Tameer-e-Millat University, Islamabad
[3]Margalla College of Pharmacy, Margalla Institute of Health Sciences, Rawalpindi, Pakistan
[4]Department of Pharmacy, University of Poonch Rawalakot Azad Kashmir
[5]Discipline of Pharmaceutical Chemistry, School of Pharmaceutical Sciences, Universiti Sains Malaysia
[6]Department of Biomedical Sciences, Kentucky College of Osteopathic Medicine University of Pikeville, Pikeville, KY, USA
[7]Faculty of Pharmacy Superior University Raiwind Road Lahore, Punjab, Pakistan
[8]Akson College of Pharmacy Mirpur AJK , Pakistan

*Corresponding author: Muhammad Soaib Said
*Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences Universiti Sains Malaysia
Email: soaib_said@yahoo.com

ABSTRACT

Background: This paper discussed about telehealth, telemedicine, or e-health their challenges and opportunities, and their implementations in the healthcare system. This is a new system which is adopted during the 21st century. It provides a faster way to cure a patient's disease or improve health.

Primary objective: The objective of this study was to conduct a survey about the emergence of telehealth and telemedicine, its implementation, adaptation, awareness, and satisfaction in the community.

Method/design: A structured questionnaire including thirteen questions about telehealth, telemedicine, e-pharmacy, and e-health has been prepared and circulated among the general population through survey.

Setting: The study was conducted in Rawalakot and Islamabad.

Participants: 200 participants are involved in the study.

Intervention: The study was also conducted to communicate with larger community to give them awareness related to telehealth and its effectiveness.

Primary out commeasures. : The study was very helpful in educated and non-educated community of the specific cities.

Results: While conducting the research based on studies, it was found that about 55% people are aware of telehealth and 20% of people are using online services and 33.4% of people are satisfied with it and 50.5% of people said it is convenient than traditional health care system.

Conclusion: A significant opportunity to improve value-based clinical care, health promotion, and disease prevention is presented by the development of novel telehealth-related capabilities and their integration into care delivery systems.

Key words: Telehealth, Telemedicine, health care system, Traditional medicines

INTRODUCTION

Telemedicine is a practice of providing or its methods between a provider in one part of area and patients in another area, in assistance of a third-party health care provider or without that. Telehealth procedures are included in the definition of telemedicine. The telehealth acknowledge that the advancing technology has enabled provider to deliver health care to person who are physically distant from them(1).

So, telemedicine is the practical practice model that was used efficiently, can offer significant advantages to patient, such as high access to the health care service, the utilization of specialty expertise, quick approach to patient records and ability for lower health service cost, greater effectiveness and better overall service(2).

Telemedicine services & network offers a wide variety of therapeutic facilities in many different areas and in continuing medical education and preventive health also(3).

The phrase "telemedicine" is used broadly and supplemented by particular clinical designation, such as "technology" or "telepsychiatry" throughout a majority of lower and higher clinical specialty fields. Additionally, particular designation in this case, teleradiology and telepathy are given to diagnostic services like radiology and pathology respectively. Which can use this technology to acquire, store, transmit and retrieve information(4).

Although usage of telehealthmay be crucial part of HIT solutions, a body of evidence supports its usage has slow to develop. Telehealth is a transmission of clinical information and clinical expertise from one location to other, allowing suffers to receive care when and where it is needed(5). Even if the number of the telehealth programs is expanding the author said that there isn't enough prof of their cost effectiveness to make from claims how beautiful telehealth is(6).

Again, it should be highlighted that early definition of telehealth emphasized medical treatment as a safe purpose and rational. Nevertheless, Bennet and his coworker broadened the definition of telemedicine in 1978 and include the idea of telehealth in the process. In this broadened sense, telehealth encompassed "technologies that enhance the delivery of health care by facilitating the sharing of information in a more effective manner"(6).

A wide range of health-related activities, such as patient and provider education, health services administration and patient care were suggested to be included in telehealth(7). The usage of telemechanic and related technologies permit, erase and perhaps improve hospital care as well as gathering and storing of patient's data are two fundamental features that telemedicine and telehealth however have in common(8).

In general, telemedicine should be considered in two situations: first, when there is no other option (for example, in remote emergency situations), and second, where it is superior to currently available conventional services (for example, teleradiology for rural hospitals). For instance, it is reasonable to anticipate that telemedicine will increase the quality, efficiency, and equity of access to healthcare. Although the quality of the study may be improved because there have been so few randomized controlled trials to far, it rapidly rose in the late 1990s(9).

METHODOLOGY
Study location

Data for research purpose was collected from university students and graduated peoples of Pakistan and AJK.

Study population
This study targeted 200 students from universities of Pakistan and received their responses. The domains covered were age, gender, Qualification, knowledge, views, experience, stratification on telehealth and telemedicine. This approach was quick and practical in terms of financial aspect.

Sampling criteria
Sampling of this study have following criteria:

Inclusive criteria
Students studying in any university of Pakistan, belonging to any department met the inclusive criteria.
Those who can understand English language were included.
Those who are interested to coordinate.

Exclusive criteria
School going students were excluded.
Those who didn't meet any inclusive criteria were also excluded.

Sample size
This survey is limited to university students of Pakistan only. The sample size for this study is 200.

Data collection
Firstly, approval from institutional review board is required. Then data collection for research purpose is done by survey method, in which questionnaire is prepared and distributed among students.

Data analysis
Data analysis is quantitative. For this purpose, findings from the study were shifted to software i.e., Excel where data is analyzed, presented in graphs showing percentages and frequencies.

RESULTS
This document reflects the strong reviews and perspective of a diverse group of students from different parts of country which are discussed as following.
There are 200 peoples which take part in this study out of which there are 51% males and 49% are females which is showed in Figure 1.
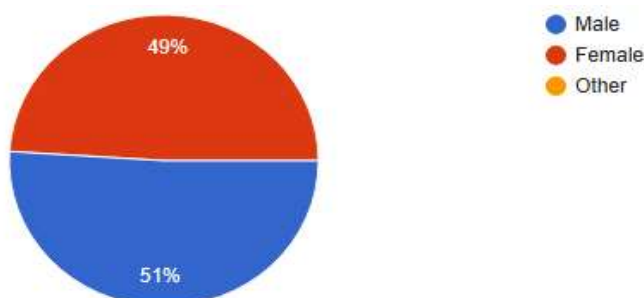

Figure 1: shows the male vs female ratio taking part in the study

Mostly young people responded in study in which 61% are the people between 20-25years, 26 % are between 15-20 years, 5% are between 25-30 years,4% are between 30-35 years and 4% are above 35 years which is showed in Figure 2.
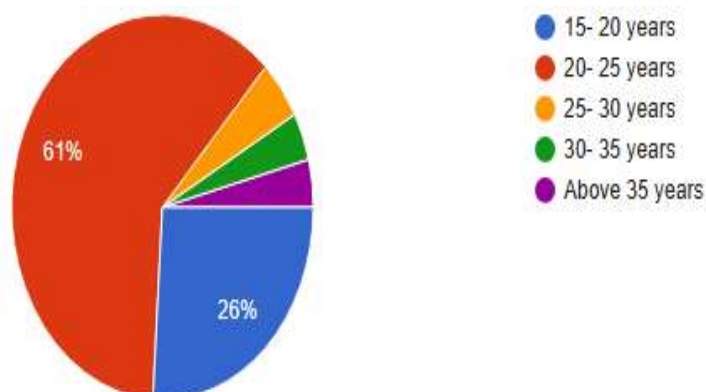

Figure 2: shows the age variation

In this study, 63% people are undergraduates,19% are graduates, 14% are FSc and 4.1% people have other qualifications and showed in Figure 3.
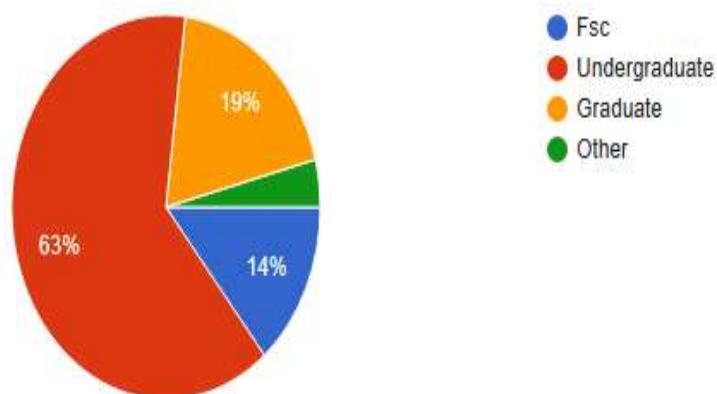

Figure 3: shows the qualification status of the participants

55% people do know about the telehealth, 30% of people do not aware of telehealth and 15% says maybe they know about telehealth shown in Figure 4.
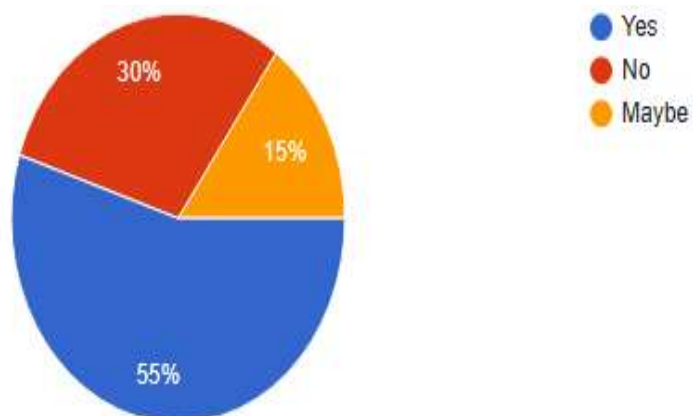

Figure 4: shows the ratio of people, having knowledge about telehealth

There are 57% of people which did not use telehealth services, 27% of the persons says they use any sort of telehealth services and 16% of people says Maybe they use telehealth services shown in Figure 5.
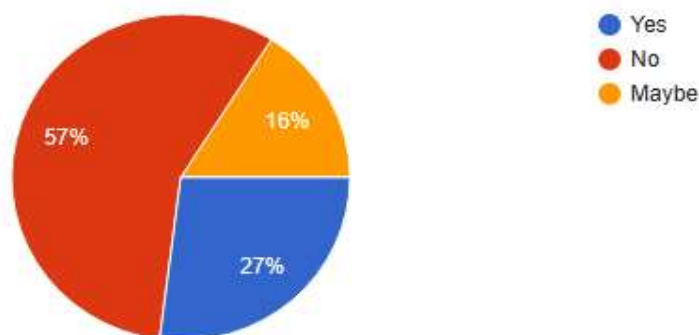

Figure 5: shows the usage of telehealth by the peoples

42% of people says they do not have tele pharmacy in their area, 16% of people say they have tele pharmacy and 39% says Maybe they have a tele pharmacy and 3% says they don't know about tele pharmacy which is shown in following Figure 6.
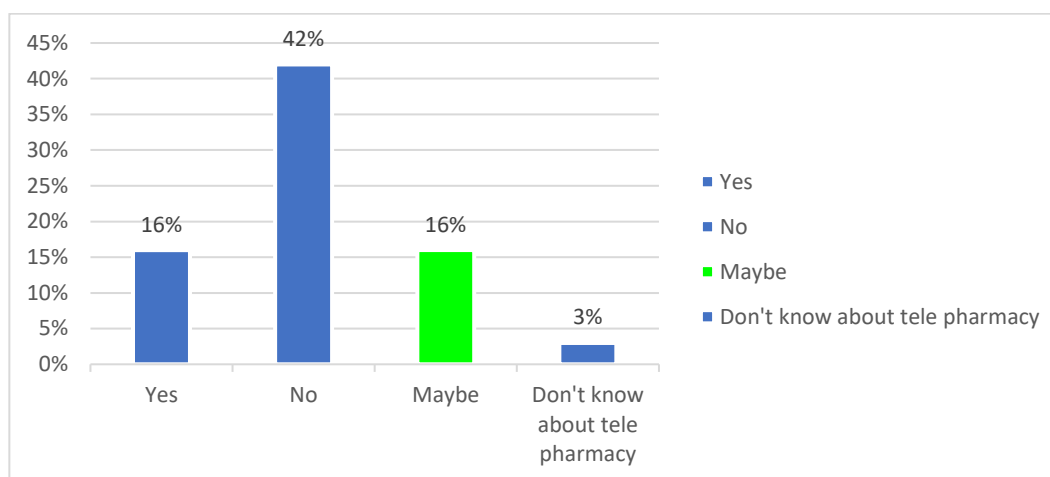

Figure 6: shows the existance of telepharmacies in participants' areas

In this study 42% of people confirm that they do not have tele laboratory services, 11% have these services, 28% are not sure about it and 19% does not know about tele laboratory services which are shown in Figure 7.
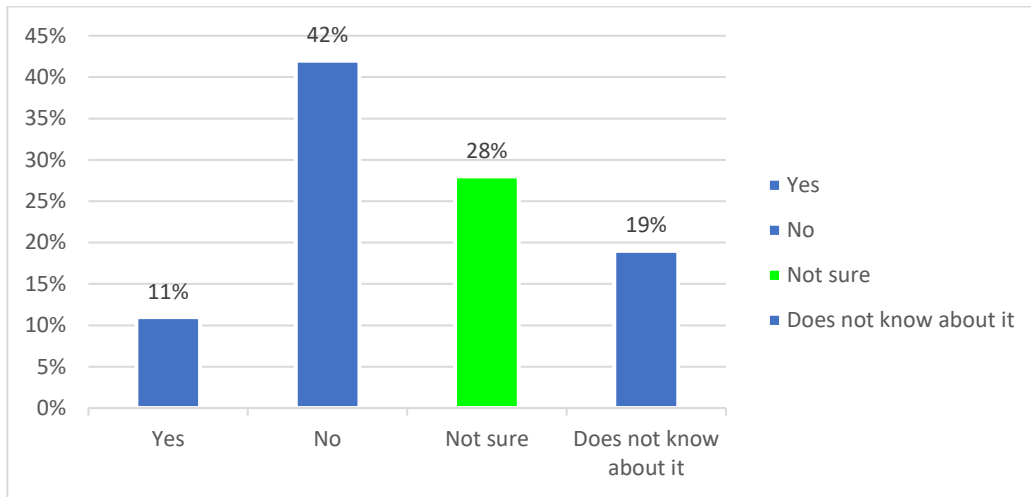
Figure 7: shows the existence of telelaboratories in different areas

In this study, 74% of people says they don't ordered medicine through online apps, 20% of people says they use online apps to ordered medicines and 6% of people say they don't know about it are shown in Figure 8.
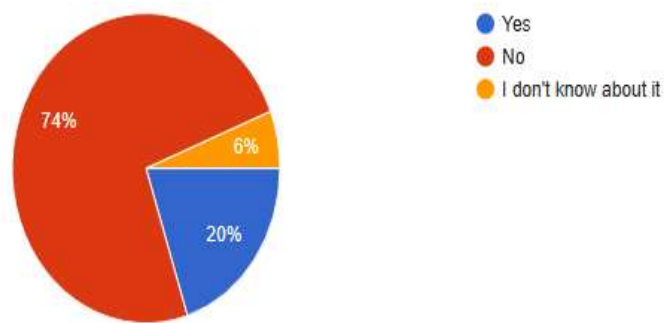

Figure 8: shows the usage of mobile apps, by the participants, to order any medicine

Only 33.4% of people are satisfied with the current telehealth services provided to them, 14.1% of people unsatisfied with these services and 52.5% of people has no idea about it and shown in Figure 9.
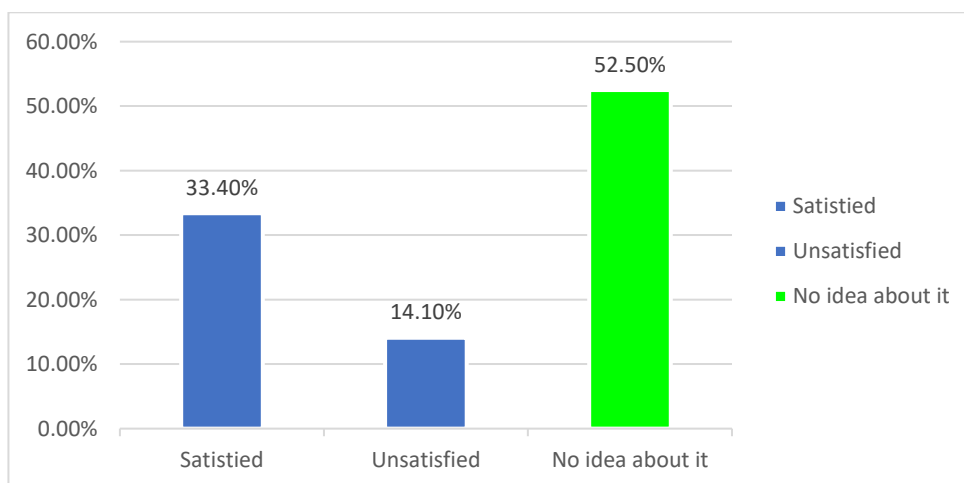

Figure 9: shows the satisfaction ratio of peoples to current telehealth services

When we asked people that can telehealth or tele medicine directly or indirectly reducing the spread of diseases from physical distancing and 50% agrees with it ,13% of persons disagree with it, 37% of people say maybe it is reducing the spread of infection are shown in Figure 10.
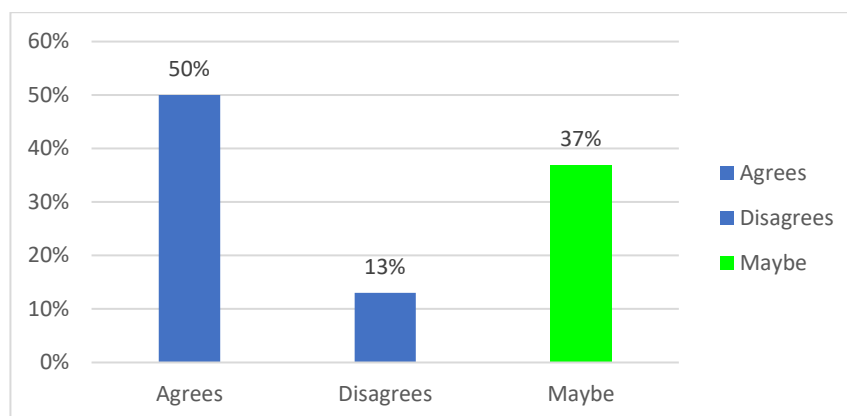
Figure 10: shows people's views on telehealth, about disease prevention by keeping physical distancing

42% of people agree that the telehealth and telemedicine are effective in pandemic condition, 16% strongly agree with its effectiveness, 33% are neutral, 6% of people disagrees about it and 3% of people strongly disagrees with it and shown in Figure 11.
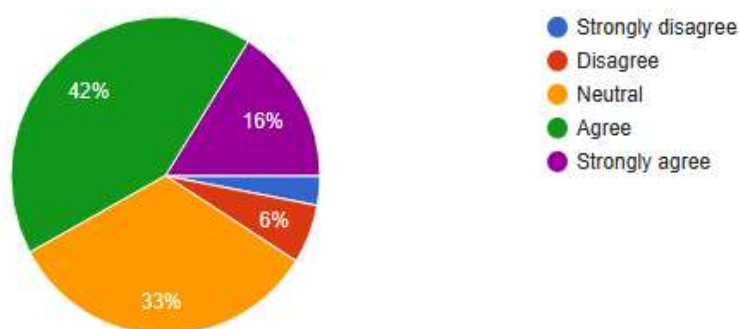

Figure 11: shows people's views on the effectiveness of telehealth in pandemic situation

55% of people agree that tele medicine services are faster than traditional system, 5% disagrees with it and 40% of people has no idea about it and shown in Figure 12.
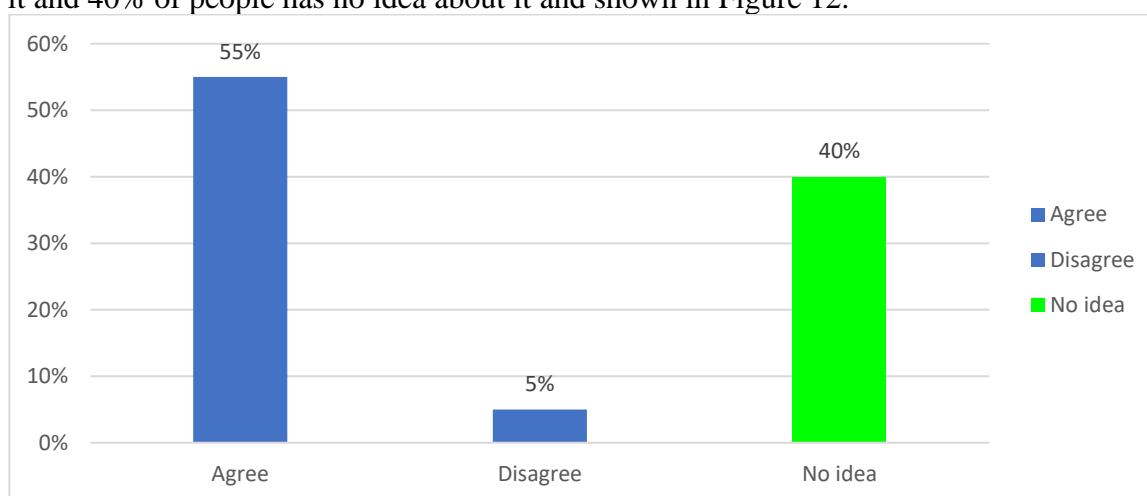

Figure12: shows participants views about effectiveness of telehealth over traditional system

50.5% of peoples say that telehealth or telemedicine is convenient than traditional health services, 7.1% of people disagrees with it and 42.4% of people says maybe it is convenient and shown in Figure 13.
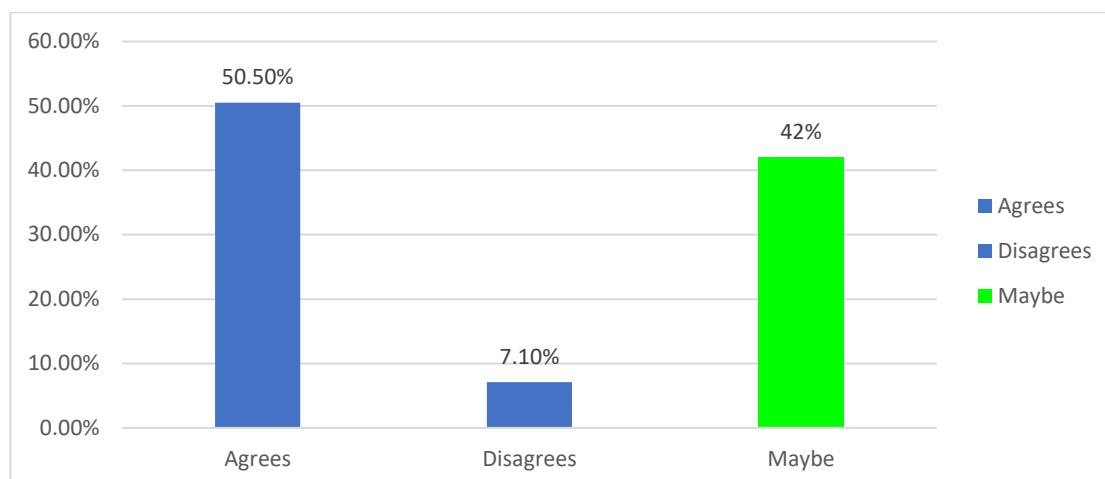
Figure 13: shows ratio of people's convenience of telehealth over traditional system

DISCUSSION

We have conducted a study on Emergence of telehealth and telemedicine, A global research agenda and its implementationin which we ask some questions about the people's knowledge about telehealth, their usage of these services, to which extant they are satisfied with these services and their improvements in future. In our study we find that the more male population took participate then female in this study which is 51% and 49% respectively which indicated that males are more attracted towards telehealth services(10).

The person who responded to our study are mostly young persons whose age are between 20-25 years. So young people are more attracted towards telehealth. Which is also seen that more young persons are using telehealth services in America whose ages are above 18(11).

But majority of the people that is 51% in our study denied that they never use any type of telehealth or telemedicine service. Majority of persons doesn't have tele pharmacy or tele laboratory in their area that is about 42% for both. Only 30% of the people say they are using telehealth services. But the persons who are satisfied with these services are only 33.4% and people are unsatisfied with these services that are 14% and 52.2% has no idea about it. So, there is far more betterment, and more awareness is required in people regarding the use of theses telehealth services(12).

In year 2022 (Don A. Bukstein, Jacqueline Eghrari-Sabet et al.) conducted a study in which 27% of people used telehealth service before COVID19 pandemic but in our study 42% of people said that the telehealth services are very help full in pandemic conditions like covid 19. And 50% of people said they consider these services are very effective in reducing spread of disease. Which is very encoring review for current telehealth or tele medicine services provider. But on the contrary the persons who uses online telehealth or telehealth services that are 20% only 33.4% satisfied with their services and remaining population does not agrees with it(13).

On the use of telephone to reduce unnecessary physical visit in 1910 a tele spectroscopy and in the 20th century NASA used remote monitoring system to measures attenuates physiological functions. The space technology applied further bring advancement in this field(14).

In 2016 WHO conducted a telemedicine survey and found that Pakistan did not have any law and regulations regarding the use of telehealth service. But regardless of this there has been a spike in the interest and use of telehealth in Pakistan according to our present study. Advances in telehealth services are in many areas including gap services coverage, urgent services, and mandated services. Progress has been made in confronting traditional barriers to the proliferation of telehealth. Mobile health is currently undergoing expensive growth and could be a disruptive innovation that will change the face of health are in the future(15).

In 1905, Dutch physician and inventor Einthoven used the prefix "tele" for the first time in a medical setting. He used the term "tele cardiogram" to describe a successful telephonic transfer of

electrocardiographic images. The term "teleognosis" was created in 1950 by inventor Coolcy and radiologist Crershan Cohen to refer to the transmission of crodiographs over wire or radio circuits. It is an acronym for the three terms tele, roentgen, and diagnosis. Jutrans introduced the phrase "tele fluoroscopy" in 1959. The last two terms failed to gain any popularity and were abandoned by users(16).Exciting prospects to improve value-based clinical care, health promotion, and disease prevention are hindered by the newly emerging telehealth system(17).

Using health organizations is a key strategy for realizing the aim of universal health. Additionally, it is accepted in undeveloped nations. The primary goal is to reduce the cost of healthcare, but e-health must be incorporated into the current healthcare system in terms of both service and policy. The ability of e-health to function successfully and efficiently globally will, in fact, be impacted by policy decisions(18).

A strong enrollment and education plan is required to optimize the patients' spending across a heterogeneous patient population because telehealth will be a novel idea for the majority of patients. To encourage the use of telehealth, improve patient satisfaction, and show a health system's return on investment, evaluation of results is crucial. Large health systems can collaborate to navigate this uncharted territory in a way that enhances the patient experience and makes the present care paradigm more effective(2).

By utilizing the internet and its powerful computational resources, next-generation telehealth tools and technologies have the potential to significantly improve healthcare for medically underserved populations by increasing access to services, improving health literacy, and growing the health care workforce through online education and training. Success depends on community education, cultural sensitivity, and end-user customization(19).

CONCLUSION

Continuous improvements and development in the field of network information technologies and peoples demand have evolved a new telehealth system, as the internet have taken the control of today's world and this is also taking control over medicines and in medical field which can revolutionized our health system. The integration of new telehealth capabilities into healthcare systems presents an exciting opportunity to enhance value-based clinical care, promote health, and prevent diseases. However, the implementation of telehealth also poses several challenges that need to be addressed. One crucial aspect for the success of e-health is effective communication training and teaching. Money and technology is also the major factors and is the problem of developing countries. Developing countries have old technology and they can not update their technology sector due to lack of money which can limit the telehealth and telemedicine services. Collaborative efforts among large health systems can play a vital role in facilitating the implementation of this telehealth system in healthcare settings. It is the responsibility of our healthcare professionals and also the government sector to improve the telehealth system likewise as it is in most of the developed countries. By expanding the use of telehealth, healthcare providers can improve patient outcomes and optimize the delivery of care. Artificial intelligence knows a days further brings improvement in this field as it is used in diagnosis of pulmonary tuberculosis and many more in this modern era. This comprehensive approach not only enhances the quality of healthcare but also demonstrates the potential for transformative advancements in the field. Though traditional system is still in practice but if we follows the modern system of healthcare it can not only saves our time but can also is more accurate and can also control the spread of diseases in pandemic situation , by keeping the peoples apart and maintaining the physical distancing between them. So, telehealth have lots of benefits and today's world is adapting this system and brings advancement in it day b day.

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