

Usage and Importance of Digital Resources and Information Technology Through Telemedicine System During Pandemic Situation – An Awareness survey among the Faculty and Post Graduate Students of Malankara Catholic College ,Mariagiri.



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A b s t r a c t

Telemedicine generally means the use of Telecommunication and Information Technology is for delivering medicinal care to the patients. Telemedicine concept was initiated from around thirty years back. At the time of inception use of telephone, slow scan images are the tools used to enable the technology. The term Telemedicine refers the utilization of telecommunication Technology for medical Diagnosis, treatment and patient care. By using Satellite Technology and video Conferencing equipment to conduct a real- time consultation between two different countries medical specialists, this technology may be simple for health professionals during the Pandemic Situation.

Keywords: Digital Resources; Information Technology; Pandemic Situation; Telemedicine; Telecommunication.

1. Introduction

Today the Digital Resources and Information Technology plays a vital role in the field of teaching, research and learning process. It is assumed that the Arts and science students feel more dependent on the Internet and Telecommunication service for their class assignments and for the latest Information of their subject areas. During the pandemic situation. In these days College Teachers also use Digital Resources to updating their knowledge and online class room teaching is similarly same as the Telemedicine Technology. Most of the activities are same in online Teaching and Telemedicine Technology. Even though the telemedicine concept is in practice some years ago, enough awareness of that is not reached to all. In the pandemic situation fear of the disease spread and not enough transportation, people try to fulfill their medical needs even sitting at their home. At that time they have contacted the medical professionals through various electronic devices and fulfilled their medical requirements. By this method the common people entered the first step in the concept of telemedicine. This study deals with that experience elaborately based on a survey given to Faculty members and Post Graduate students of Malankara Catholic College Mariagiri.

2. About Malankara Catholic College, Mariagiri

Malankara Catholic College is owned and managed by the Diocese of Marthandam with the approval of the Government of Tamil Nadu, and is affiliated to Manonmaniam Sundaranar University, Thirunelveli.

The college was born out of the Educational Vision of the Most.Rev.Lawrence Mar Ephraem, the first Bishop of the Catholic Diocese of Marthandam, established on 20th July, 1998. Subsequent to his eternity on 8th April, 1997, the Most.Rev.Yoohanon Mar Chrysostom became the second Bishop of the Diocese of Marthandam on 1st July, 1998. Under his untiring inspiration coupled with the foresighted efforts of Rev.Fr.Prem Kumar, M.S.W, the previous Correspondent/Secretary; the polite behavior of Rev.Fr.Maria Arputham M.A, the former Bursar, the able guidance of the former Principals and the dedicated staff members, the college began to flourish. At present, the college stands as a land mark in the field of higher Education with the new dynamic Chairman and Manager, His Excellency the Most.Rev.Dr.Vincent Mar Paulos, the Bishop of Marthandam Diocese; an Eminent Correspondent/Secretary Rev.Fr.Jose Bright and an experienced Principal, Dr.J.Thampi Thanka Kumaran M.Sc(IITM)Ph.D. (University of Hyderabad).

In this institution 12 UG courses, 11 PG courses, 4 M. Phil Research wing, and 5 P.hD research wing are functioning.

2.1. Vision and Mission of the College

Vision : Transformation of Society through Human Resources.

Mission : Excellence in value based Education and Research for the development of human Resources.

Motto : "Learn to Serve"

Goals : To impart quality education through an innovative learning environment.

3. Literature Review

This word 'Telemedicine' is derived from the Greek and Latin Origin in a mixture of two words, 'tele and mederi', which means 'at a distance' and 'healing' respectively. Telemedicine has several definitions, mainly physicians examine patients at distance through the use of telecommunication technologies to deliver health care. (1)

In its earliest age smoke signals used by African villages to warn people in case of serious disease, to stay away from the village. People living in remote areas of Australia, in early 1990s used two-way radios to communicate with the Royal Flying Doctor Service of Australia.(2)

4. Objectives

Usage of Digital Resources and Information Technology through Telemedicine System are the main purposes to this study. The main objectives are:

- To identify the personal clinical visit during pandemic situation.
- To identify the easiest way to consult the medical professionals of various places and get diagnosis at the same time which enables low cost.
- To identify various purposes to chat/teleconferencing to medical professionals.
- To identify needed digital /electronic resources /technological devices to use telemedicine facility.
- To identify present and future usages of telemedicine facility.
- To identify impact of telemedicine facility.

5. Scope

Advanced studies of various countries may be used to all countries, in the field of medicine necessities of various Infrastructure buildings are lessened. Professionals of Electronics and Telecommunication field may get opportunities in the field of medicine.

The involvement of Electronics Digital resources and Telecommunication paves the way to increases the Research and Development of Telemedicine in future.

6. Types of Telemedicine

6.1. Store and forward Telemedicine

In this system medical data's like medical images, bio signals etc. are collected and then transmitting this data to a medical specialist at a convenient time. The presence of both the parties at the same time is not at the same time is not at all required. Dermatology, radiology and pathology are common specialties to asynchronous Telemedicine. A component of this transfer is a properly structured medical record preferably in electronic form.

6.2. Remote monitoring

This enables medical professionals to monitor a patient using various technological devices, remotely also known as self-monitoring or testing. Chronic disease such Heart Disease, Diabetes Mellitus, or asthma are primarily used for managing, by this method. This monitoring service may be cost effective but can provide comparable Health outcomes and supply greater satisfaction to patients.

6.3. Interactive telemedicine

This services provide interaction between the patient and the professionals. Which includes phone conversation and online communication, many activities and assessments can be conducted comparably in face to face visits, such as History review, physical Examination and psychiatric evaluations. This Telemedicine services is less costly them in-person clinical visit.

7. Working System Of Telemedicine

The Telemedicine application consists of mainly 3 components.

7.1. The Central Control Unit:

The central control unit is the nerve center of the telemedicine application. Generally sited at a large

tertiary hospital, it is manned 24 hours a day days a week, is fully IT enabled and capable of the following:

- * Replies by specialists to queries based on Electronic Medical Records (EMR) of patents, transmitted to them from the periphery.
- * Opinions on ECGs, EEGs, CATs, MRIs, X-Rays, Ultrasounds, image of pathological specimens, histological slides, skin, ear, nose, throat, eyes, fundus, etc transmitted digitally.
- * Live chat with Medical Professional on patient care.
- * Teleconferencing between patient to Medical Professional and Medical Professional to specialist.
- * Remotely monitored surgical procedures.
- * Monitoring chronic cases.
- * Counseling of selected psychiatric cases.

7.2. The Communication Link:

Depending upon various factors , communication between the central and peripheral units could be by telephone lines (analog, ISDN),mobile phones, satellite phones, fiber–optic cables ,wireless LANs, Satellite links,WiFi,WiMAX,4G etc.

7.3. The Peripheral unit:

This is the actual workhorse of the telemedicine application. Depending on requirements there could be anywhere from 50 to 500 (or more) of such units spread over a geographic location in consonance with the aims and objectives of the telemedicine system. A single unit would consist of a computer terminal (or a LAN) in communication (or capable of being in communication) round the clock with the central control unit. The software on this terminal (or LAN) would be capable of capturing and digitizing ECGs, EEGs, CATs, MRIs, X-Rays, Ultrasounds, images of pathological specimens, histological slides, skin ear, nose throat, eyes etc. All of these images along with the patient data in the form of an electronic medical record would be stored and /or transmitted, if necessary in real time, to the central control unit for necessary feedback. It would also be live chat and teleconference capable (3).

8. Telemedicine in Village Resource Centre

ISRO has also initiated pilot projects for integrating Telemedicine /Tele-health with the Resource Information database as well as Tele – Education Facilities at the village Resource Centre /Community Centre (VRC) to reach out to more rural areas of the country. The first of the pilot projects has been implemented in the state of Tamil Nadu wherein the nodal center operated by an NGO agency is connected to remote villages in three districts and more are to come in the future. One of the major advantages of Telemedicine technology has been the saving of cost and effort to the rural patients as they are not required to travel long distances for obtaining consultation.(4)

9. Vision of Dr.A.P.J.Abdul Kalam about Telemedicine

Dr.A.P.J.Abdul Kalam says that construct an internationalized quality hospital at Kudankulam with 500 beds and provide telemedicine facility for all villages. (5)

10. Significant Benefits and Healthcare & Uses of Telemedicine System

* For Those people living in isolated communities and remote regions The Telemedicine is extremely Beneficial and is currently being applied in virtually all medical domains. Patients live in Isolated and remote areas can get medical facilities by a professional specialist who can provide complete and accurate examination. And also the patient may not have to travel, irrespective of distance or time

* Experienced medical professional at a distance place can show and instruct medical e the patient need not wait, to get the medical facilities. Staff in another location through this system, more effectively, by which is used as a teaching tool.

* It increases efficiency through better management of chronic deceases and it reduces travel times, also reduces cost of Healthcare.

* This Tele monitoring program include subjective questioning of patients Health and Comfort, in addition. This system can keep the patient in touch with the medical professional, who can question the patient over phone or monitoring software. By which the professional can make decision about the patient based on subjective and objective information.

* Uses of Tele monitoring devices include Blood pressure, Blood glucose, Heart rate, Hemoglobin etc. By the Tele monitoring system the patient has necessary monitoring about and vital sign, is capable of providing Information.

* The professional may check these statistics and determine the best course of treatment, on the severity of the patient's condition.

11. Methodology

The investigator personally visited to collect data from the respondents. The questionnaires for the users of telemedicine were filled up by the Faculty and Post Graduate students of Arts and Science College. A total sample of 25 Faculty members and 25 Post Graduate Arts and Science Students was taken up for the present study.

For sampling, random sampling process was followed for data collection. The sample was random in the sense that the faculty and post Graduate students were randomly selected from various PG departments in Malankara Catholic College Mariagiri. Taking at least five Faculty members and five Post Graduate students were selected randomly from each Departments such as Biotechnology, Biochemistry, Microbiology, Geology & Chemistry. 50 questionnaires were distributed among the Faculty and Post Graduate Arts and Science Students of the Malankara Catholic College. Under this study all questionnaires were received back duly filled in.

12. Analysis

Table 1. Frequency of regular hospital visit before pandemic situation

Hospital visit before Pandemic Situation	Frequency	Percentage (%)
Daily	2	6
Once in a week	8	16
Once in a month	15	30
Once in a year	25	50
Total	50	100

Note: n=50

The question was asked to find out the frequency with which respondents visit the hospital before pandemic situation. A total of 2(4%) indicated that they visit the hospital for their health before pandemic situation every-day, 8(16%) of them reported that they visit once in a week, 25(50%) visit it once in a month, while 15(30%) respondents reported that they visit the Hospital once in a year. This indicates that most of them visit the Hospital at least once in a month regularly.

Figure 1. Frequency of regular Hospital visit before pandemic situation

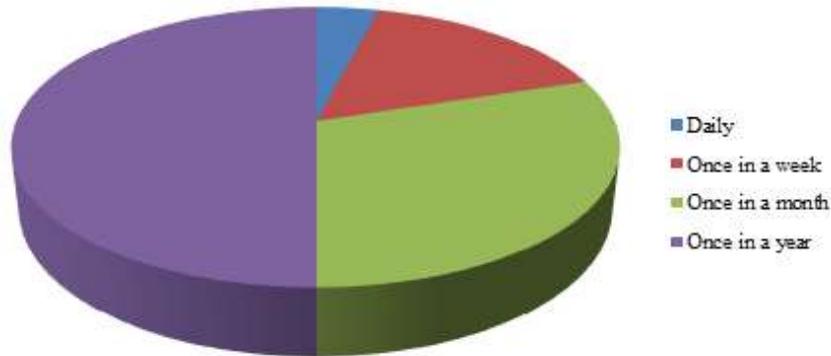


Table 2. Amount of time spent on the hospital visit

Amount of time	Frequency	Percentage (%)
7-9 hours	6	12
5-6 hours	9	18
2-4 hours	14	28
Less than one hour	21	42
Total	50	100

Note: n=50

Table 2 shows that the maximum number of respondents of 21(42%) spent the amount of time for their regular hospital visit is less than one hour, 14(28%) spent the time for their hospital visit 2- 4 hours, 9(18%) spent the time for their hospital visit 5-6 hours, only 6(12%) respondents have indicated that they spent the amount of time for their hospital visit 7-9 hours.

Figure 2. Amount of time spent on the Hospital Visit



Table 3. Distance to the location of the hospital used

Distance to the location	Frequency	Percentage (%)
Within 1km	5	10
Within 5km	7	14
Within 25km	20	40
Within 50km	15	30
Above 50km	3	6
Total	50	100

Note: n=50

Table 3 shows that only 3(6%) respondents use the hospital location above 50km, 5(10%) within 10km, 7(14%) within 5km, 15(30%) of respondents used the hospital location within 50 km, and the majority of the respondents of 20(40%) used the hospital location within 25 km.

Figure 3. Distance to the location of the hospital used Frequency

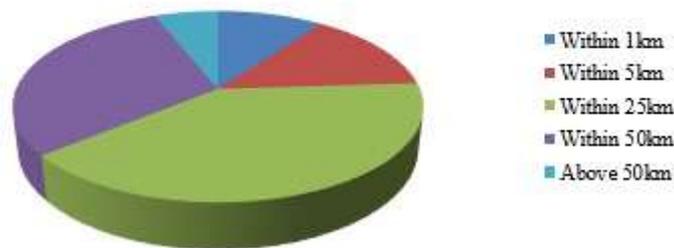


Table 4. Reason to visit hospital

Reason to visit hospital	Frequency	Percentage (%)
For self	18	36
For their parents	14	28
For their siblings	5	10
For their children	13	26
Total	50	100

Note: n=50

Respondents were asked to indicate the reason to visit hospital .It is found that most of the respondents of 18(36%) visit the hospital for self. A total of 14 of them (28%) indicated that they visit the hospital for their parents, 13(26%) of respondents visit the hospital for their children and 5(10%) of them for their siblings.

Figure 4. Reason to visit hospital

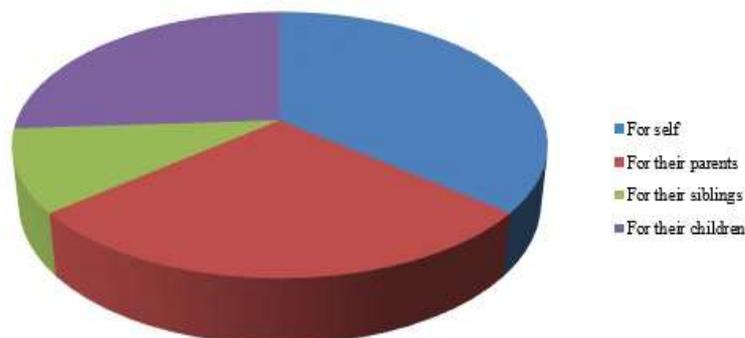


Table 5. Types of health problems for visit hospital

Types of health problems	Frequency	Percentage (%)
For common illness (fever, headache etc.)	15	30
For Diabetic mellitus	5	10
For Obesity	3	6
For Respiratory diseases	9	18
For Ophthalmic diseases	10	20
For ENT diseases	8	16
Total	50	100

Note n=50.

Another question was related to the types of health problems for hospital visit. Table 5 shows that among the health problems most of the respondents 15(30%) visit the hospital for common illness (fever, headache etc...), 10(20%) of respondents visit the hospital for ophthalmic diseases. Hospital visit for Respiratory related disease comes next, this is being for hospital visit by 9(18%) respondents. Next in order come for ENT disease with 8(16%) respondents. For diabetic mellitus with 5(10%) respondents and for Obesity with 3(6%) respondents.

Figure 5. Types of health problems for visit hospital

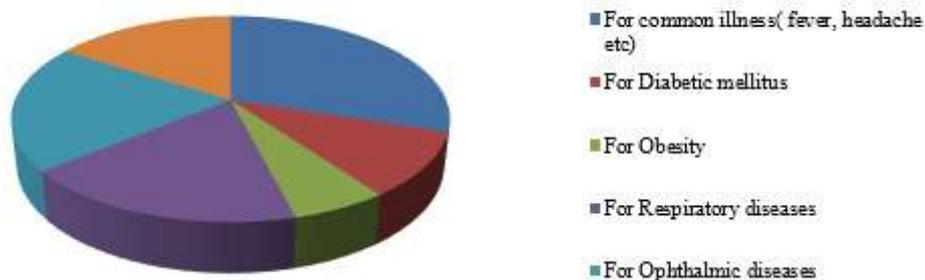


Table 6. Ways to get medical advises in the pandemic situation.

Ways to get medical advises	Frequency	Percentage (%)
Guidance from their regular consulting medical professional	10	20
Advice of medical professional in television	13	26
Message from social medias	16	32
Articles in news paper	7	14
From healthcare magazines	4	8
Total	50	100

Note n=50

Table 6 says that ways to get medical advices in the pandemic situation is various types. The ways to get medical advices in the pandemic situation mainly come from 5 types. 16(32%) of respondents get medical advices from social media. 13(26%) of respondents are get the advice of medical from television shows. 10(20%) of respondents get guidance from their regular consulting medical professional which takes a minimum of slot time to get their needed information. Another 7(14%) of respondents report that they get the needed medical information from newspaper articles and the respondents of 4(8%) only get the medical information from health care magazines.

Figure 6. Ways to get medical advises in the pandemic situation

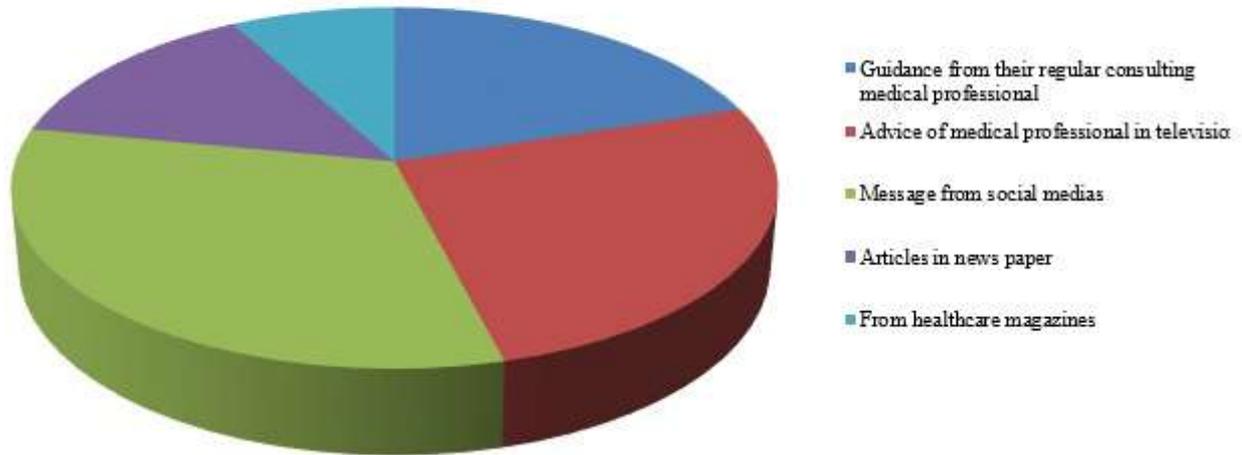


Table 7. Types of medium used by the respondents to communicate their regular consulting medical professionals in pandemic situation.

Types of medium used	Frequency	Percentage (%)
Through audio call	20	40
Through video call	15	30
Through Email	5	10
Through chat with messages	10	20
Total	50	100

Note n=50

Table 7 exhibit that a majority of the respondents of 20(40%) communicate to their regular consulting medical professional through audio call. 15(30%) of respondents communicate to their medical professionals through video call. 10(20%) of respondents through chat with messages and only 5(10%) of respondents communicate to their medical professionals through email.

Figure 7. Types of medium used by the respondents to communicate their regular consulting medical professionals in pandemic situation

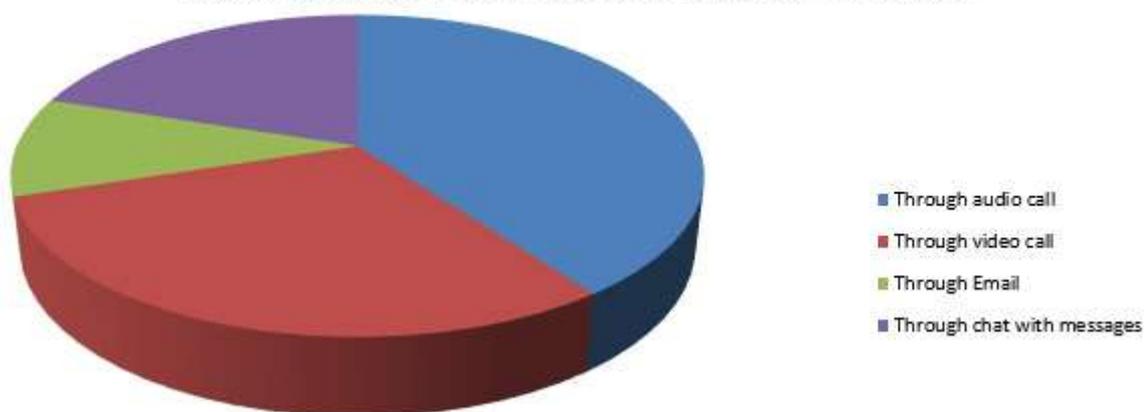


Table 8. Medium used to send medical reports to their regular consulting medical professionals in pandemic situation

Medium used	Frequency	Percentage (%)
Through Email	17	34
Through WhatsApp	33	66
Total	50	100

Note n=50

Table 8 shows that most of the respondents 33(66%) use to send medical reports to their regular consulting medical professionals in pandemic situation through WhatsApp and the remaining 17(34%) of respondents were used to send through Email.

Table 9. Problems faced while contacting the medical professional through electronic devices.

Problems	Frequency	Percentage (%)
Network related problems	20	60
Electronic device related problem	30	40
Total	50	100

Note n=50

Table 9 shows that most of the respondents 30(60%) faced the problem while contacting the medical professional through electronic devices is network related problems. Another 20(40%) of respondents faced electronic device related problem while contacting medical professional

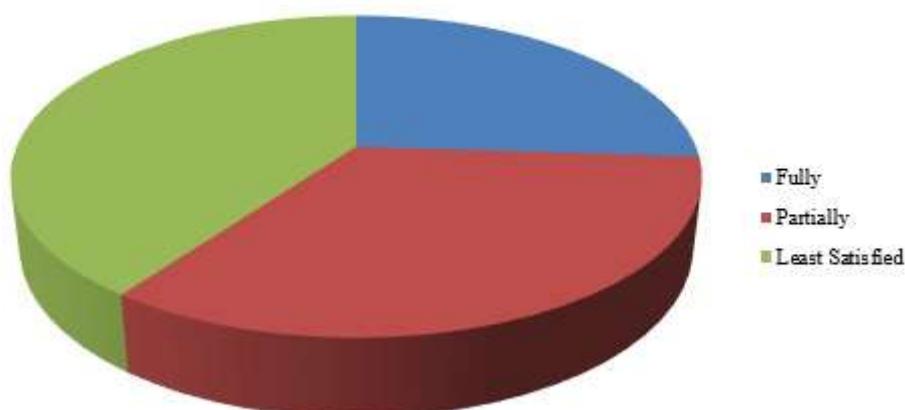
Table 10. Satisfaction of consultation to the medical professional through electronic media

Satisfaction of consultation	Frequency	Percentage (%)
Fully	13	26
Partially	17	34
Least Satisfied	20	40
Total	50	100

Note n=50

Table 10 shows that most of the respondents of 20(40%) least satisfied their consultation through electronic media. 17(34%) of respondents partially satisfied and the remaining 13(26%) of respondents only fully satisfied for their medical consultation through electronic media

Figure 10. Satisfaction of consultation to the medical professional through electronic media



13. Suggestions

Based on the survey findings of the study, the following suggestions are put forward to improve the use of Telemedicine system for common people.

* In this telemedicine system transportation expense, traveling huddles and Hospital expanse are very much less, but in the areas where are remote and low network coverage, this system can't be implemented effectively. And hence there should not be any area which is not covered by the network, then only everybody have its use.

* Moreover the users of this Telemedicine system must have at least some knowledge in the electronic devices to handle. Also the hospitals must conduct seminars to make awareness at least to their regular consulting patients, how to contact the medical professionals and fulfill their needs, at those times when they can't come to the hospitals directly during the pandemic situation.

14. Conclusion

This Telemedicine system is in Voyage, in one form or another, for over thirty years. In short a nurse or medical professional providing medicinal advice over telephone is Telemedicine system. The recent activity on Telemedicine Application employ advanced image as well as audio capabilities. This Telemedicine Technology now range to sophisticated integrative Teleconferencing system. In this Telemedicine system special interests in these Advanced Technology is increasing Significant about Telemedicine remains same. This Telemedicine system plays a vital role during the pandemic situation, and this became an unavoidable medicinal Technology in future also.

15. Acknowledgements

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