Summer Training

at

Camomile Healthcare Ventures

MAY 10th to JULY 9th, 2021

Research and Analysis on a Year of Covid and its Impact on Telemedicine Landscape of India

by

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MBA Hospital and Health Management

2020-2022

Camomile Healthcare Ventures Pvt Limited

19 July 2021

Mr. Ankit Kumar Jha
IIHMR University, Jaipur

INTERNSHIP COMPLETION CERTIFICATE

This is to certify that Mr. Ankit Kumar Jha, student of Hospital and Healthcare Management (MBA) IIHMR University, Jaipur, Batch 2020-22, has successfully completed internship at Camomile Healthcare Ventures Pvt Ltd.

The duration of internship was 9 weeks from 10 May 2021 to 9 July, 2021.

The topic of the project work done is 'Research and analysis on a year of Covid and its impact on the telemedicine landscape of India'.

During the tenure of his internship, he was sincere, hardworking, enthusiastic and a keen learner.

We wish Mr. Ankit the very best for his future endeavours.

Sincerely,

Y.V. Raghava Rao.

Raghava Rao
CEO

Acknowledgment

This summer training project opportunity was a great chance for learning and professional development. I articulate my wholehearted gratitude to all individuals who have added to the summer training project and supported me in one way or the other during this period.
I would like to extend my best regards and deepest sense of gratitude to my mentor, Dr. Piyusha Majumdar, Assistant Professor, IIHMR University.

A sincere note of gratitude and affection to the IIHMR University for preparing me to work on assigned tasks and for providing me with opportunity to refine my talents at all levels.

This opportunity represents a major move further in the career growth. In order to attain my professional goals, I will take every opportunity to apply my newly gained knowledge and expertise to good use, and I will strive to progress on refining them.

Table of Contents

1. Acronyms/Abbreviations

1. GoI - Government of India
2. MoHFW - Ministry Of Health And Family Welfare
3. WHO - World Health Organisation
4. CDC - Center for Disease Control and Prevention
5. OPD - Outpatient Department
6. COVID-19 - Coronavirus
7. NITI - National Institution for Transforming India
8. EDS - Emergency Department
9. ICT- Information And Communication Technology
10. MCI - Medical Council of India
11. DAU - Daily Active Users
12. CAGR - Compound Annual Growth Rate
13. GP - General Practitioner
14. RMP-Registered Medical Practitioner
15. BoG – Board of Governors

Part -I

Observational learning

2.1 Background

"Camomile" is a herb consumed as tea that is renowned to give stress reduction, serenity, and excellent health. Camomile Healthcare's mission is to relieve hospital stress, improve efficiency, and assist hospitals thrive.

Camomile Healthcare Ventures began in 2016 intending to make healthcare more efficient and process-driven. To develop the tools, standards, and practices that will assist hospitals in becoming value-driven and patient-centric.

2.2 Introduction

Camomile is one of Asia's fastest-growing and largest healthcare strategy and implementation consultancy firms. Increasing horizons to provide appealing solutions to healthcare companies in new areas. assisting healthcare organisations and investors in creating market-driven and high-performance assets and assisting them in achieving their most critical goals Camomile is well-positioned to shape the future of healthcare, with over 150 years of expertise.

The senior management team has extensive expertise working with healthcare organisations and investors in India and Africa. Headquartered in India, the company manages projects all around the world.

The ability to grasp the demands and offer the needed solution on time is a key strength. Working with major organisations in the business, governmental, and social sectors, they have developed extensive functional and industrial knowledge. Working together to convert difficulties into opportunities, a passionate team strives to bring about the transformation that the healthcare sector needs.

Mission:

To help healthcare organizations make distinctive, lasting, and substantial improvements in their performance, by delivering them with the evidence they require to produce statistics-focused choices.

Vision:

To be the most well-known, forward-thinking, data-driven provider of end-to-end healthcare solutions in the market. We will enhance access, efficiency, and cost for healthcare delivery today and in the future by collaborating with our clients.

Values:

- Observe the highest ethical standards.
- Maintain an independent perspective.
- Deliver sustainable value and excellence to our clients.
- Conduct business with absolute integrity
- Advocate a caring meritocracy for employees, partners, and clients.

Camomile Healthcare saw the critical need for data-backed consulting services to assist in the creation of efficient hospitals that deliver patient-centric care. We established one of the top healthcare consulting firms.

Today, it is a prominent healthcare consultancy and transformation services firm that uses deep industry experience, cutting-edge analytics, technology, and strategy to develop real-world solutions for clients.

3. General Findings and Learnings

The internship began on May 10, 2021. During the 9-week internship at Camomile Healthcare Venture, I get hold of the opportunities to work on a range of projects under the guidance of various mentors. These projects were primarily worked on in cooperation with classmates from IIHMR University and interns from IIM, Calcutta.
These projects were both strenuous and beneficial to the overall learning process. The projects and the lessons are listed below.

- **Market research on critical medicine supply (COVID)**

The second wave of covid was at its peak in mid-May, and vital medications were in limited supply across the country. Initial research revealed a lack of prior planning, mismanagement in the supply chain, and a delay in receiving information about the availability of these medications in one's specific location. Critical medications include the following:

1. Azithromycin
2. Baricitnib
3. Dexamethasone
4. Fabiflu
5. Favipiravir
6. Ivermectin
7. Kaletra
8. Limce
9. Pantop
10. Remdesvir
11. Tocilizumab
12. Zincovit

Initially, research was done on the availability of these medicines in the Chennai region to tackle the finding i.e., delay in the information of availability of medicines. A dashboard was asked to be developed for the live updates of the medicines. This was again done for Bengaluru city and the same research and dashboard was built for it.

- **Post covid discharge complications and side effect management**

Due to this peak in covid cases, there were shortages of beds and turn around time of admitted patients wasn't constant. New findings of the virus were floating each day, this created uncertainty in the diagnosis of covid. Especially, new cases of black fungus along with new mutated variants. An individual recently discharged was at high-risk risk of contracting these and develop complications.

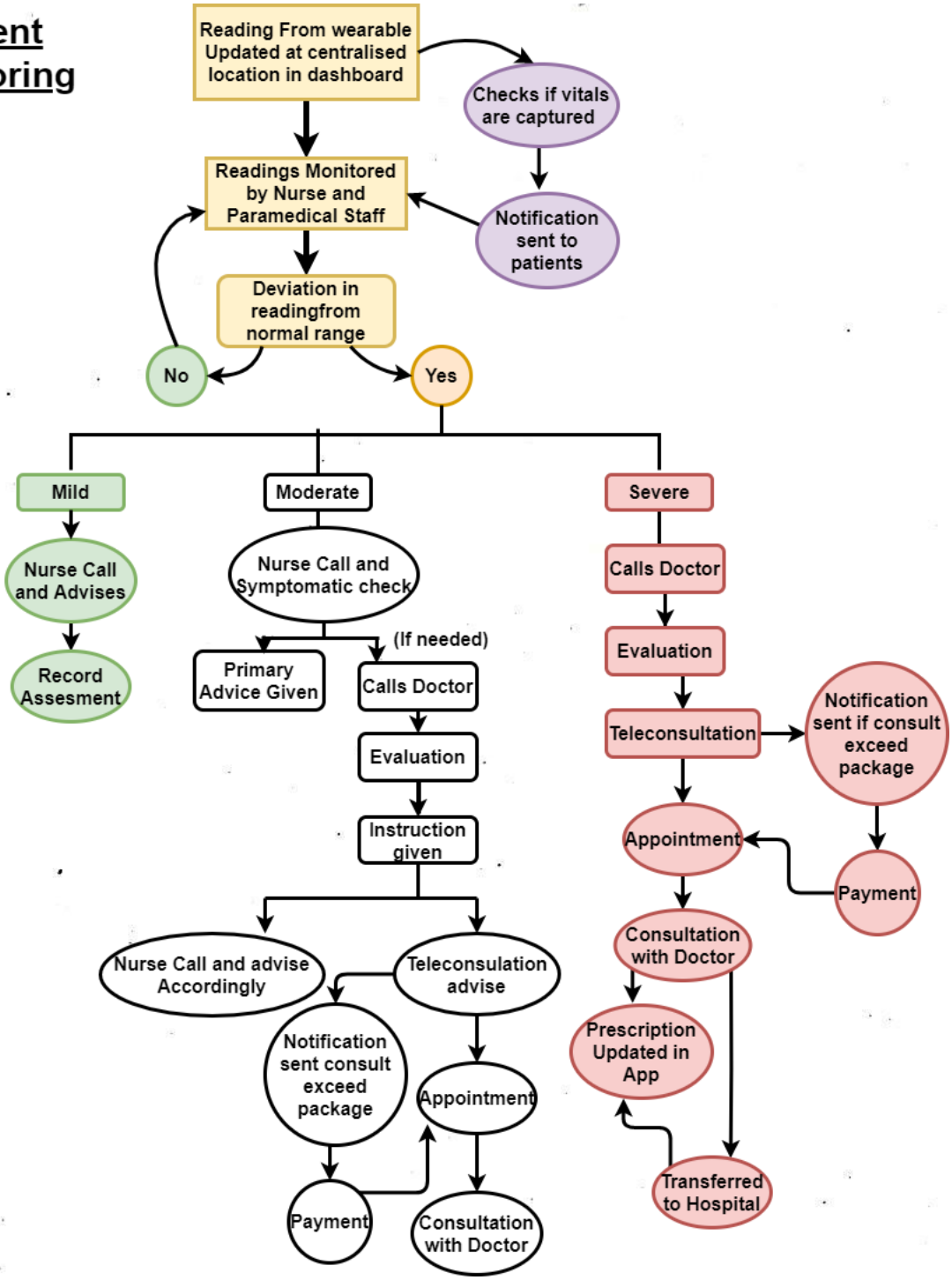
A measuring tool was developed to understand these complications and other side effects in individuals recently discharged with relevant demographics details, and any attempt to establish a correlation was done. Assistance was provided in response collection along with developing the tool. The response was collected through various mediums, floating forms over social media and in closed groups, and telephonic interviews were also conducted to get responses as early as possible.

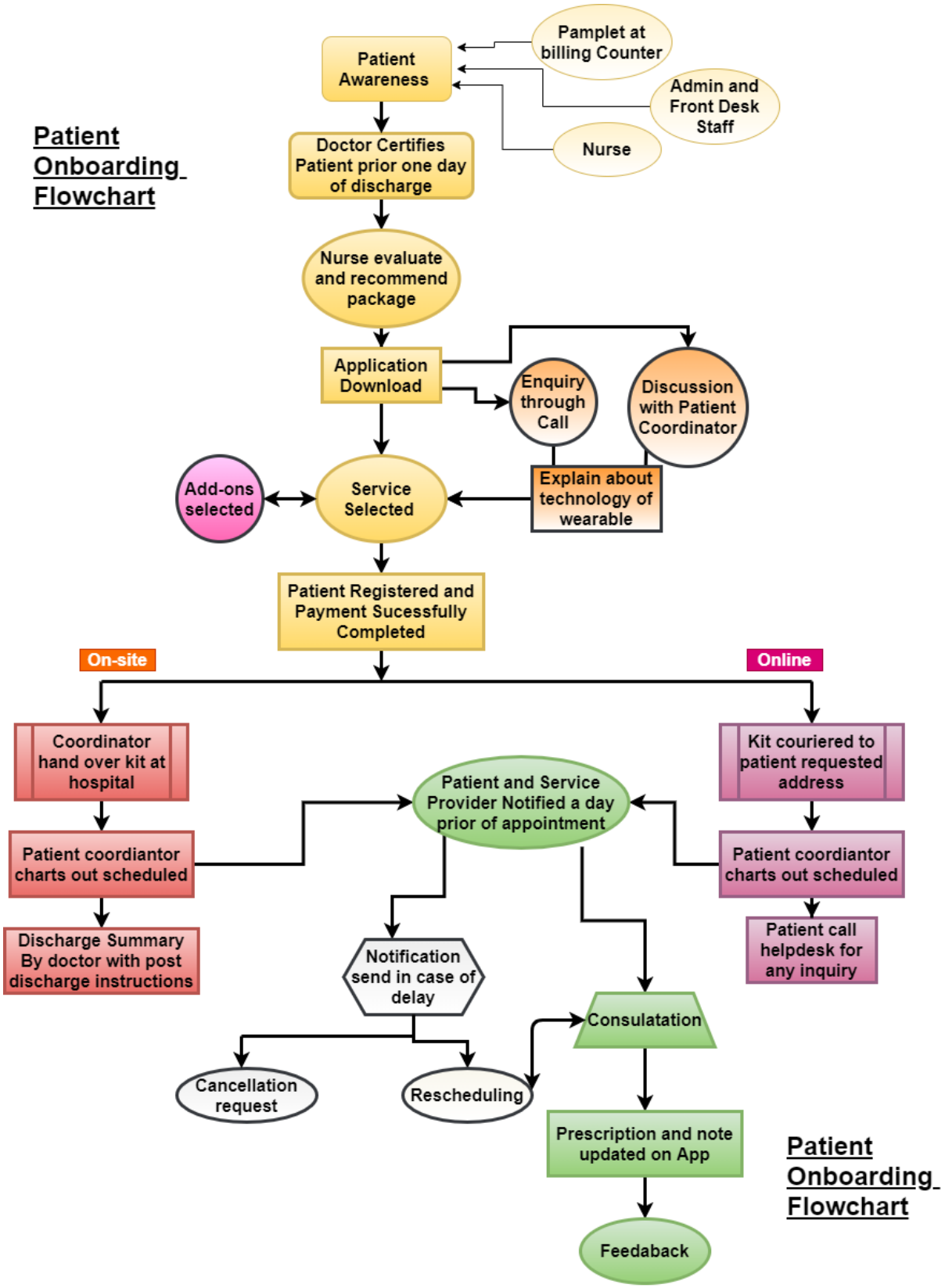
- **Patient onboarding and monitoring**

With the findings of previous research, an application was approved. The primary objective of it was to accumulate all the resources at single-junction i.e., online consultation, support group, medicine availability info, recreational activities, etc.

After Multiple brainstorming sessions, with some secondary research and utilizing knowledge from the patient delivery system. A plan was developed for the smooth functioning of monitoring and onboarding, and this was visually represented with the flow chart.

Patient Monitoring




Patient Onboarding Flowchart
Patient Awareness
Pamplet at billing Counter
Admin and Front Desk Staff
Nurse
Doctor Certifies Patient prior one day of discharge
Nurse evaluate and recommend package
Application Download
Enquiry through Call
Discussion with Patient Coordinator
Add-ons selected
Service Selected
Explain about technology of wearable
Patient Registered and Payment Sucessfully Completed
On-site
Online
Coordinator hand over kit at hospital
Kit couriered to patient requested address
Patient and Service Provider Notified a day prior of appointment
Patient coordiantor charts out scheduled
Patient coordiantor charts out scheduled
Discharge Summary By doctor with post discharge instructions
Patient call helpdesk for any inquiry
Notification send in case of delay
Consulatation
Cancellation request
Rescheduling
Prescription and note updated on App
Feedaback
Patient Onboarding Flowchart

- **Calling for Patient onboarding**

To receive feedback on the plan we developed, telephonic interviews were conducted in the Andhra Pradesh region. The primary objective was to receive feedback, understand perception and figure out room for improvement in our service plan.
The secondary objective was to convince individuals to sign up for the service and start service on a small scale as the pilot project incorporates changes and improves with time and provides better service.

- **Research on Patient engagement programs**

In Secondary research, various research papers and articles highlighted the level of anxiety and stress an individual goes through on a personal level after contracting covid and post-discharge while recovering from it. To reduce this and promoting mental health, engagement programs such as:

- Yoga and Medication
- Motivational Videos and Speaker Session
- An online forum for interactive sessions
- Stand-up comic sessions

These were initial recommended activities and relevant content was provided along with this for reference, after analysis of the targeted onboarded individual.

- **Maternity clinic survey**

An additional survey tool was created to better understand the decision-making process of pregnant women while choosing a hospital for delivery. Factors that influence their selection include their expectations from hospitals in terms of care and ambience, as well as service packages and their costs.

- **Hospital Brand Perception survey for maternity hospital**

A survey questionnaire was developed comparing four major hospitals (Maternity), om aspects such as Price, Reliability, Service. Hospitals were:

1. Apollo Hospitals
2. Fortis Hospitals
3. Motherhood
4. Cloudnine

Individuals were asked questions to understand the perception, preference, and trust as a brand over these hospitals. Respondents were based in Bengaluru only.

- **Social media content Creation**

Lastly, I was also given the responsibility of handling the social media handles of Camomile Healthcare Ventures. An opportunity to express creatively through social media creatives was provided for various occasions such as Yoga Day, Onam, Independence Day, etc. All the creatives were developed after extensive research and precisely keeping our target audience in mind and of the image of the organization.

Also, to increase traffic over the camomile LinkedIn page, research was done in a limited capacity and one of the recommended solutions was the utilization of Search Engine Optimization (SEO), learned in the marketing management module.

Part- II

Project Report

4.1 Abstract

On January 27, 2020, a 20 years old female went to the Emergency Department in General Hospital, Thrissur, Kerala, with a one-day history of dry cough and sore throat, this was the lone verified incident of Covid in India after the first incident in the world being observed in early December 2019. Since that first case in January, the contagious Coronavirus spread rapidly in the general population. After a day of "Janta Curfew" on March 22, 2020, the Government of India imposed strict Lockdown from March 24, 2020. On the next day 25th March, 2020, MoHFW issued the **Telemedicine Practice Guidelines**, 2020 under the Indian Medical Council Act, 1956 and which superseded the Indian Medical Council (Professional Conduct, Etiquette and Ethics Regulation, 2002. This allowed the registered practitioner to provide teleconsultation under a clear rule from GoI. In a Strict lockdown where citizens were reluctant and advised not to visit hospitals and were having the option to teleconsult for minor alignment. This study attempted to access the effect of this policy change especially considering the timing it was introduced. Its effect on the existing telemedicine landscape and understand future possibilities.

4.2 Introduction

"The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for the diagnosis, treatment, and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities"

- World Health Organisation(WHO)

"Telemedicine is the use of electronic information and telecommunication technology to get the health care you need while practicing social distancing."

- Centers for Disease Control and Prevention(CDC)

The numerous definitions underline that telemedicine is an open science that is continually developing, including new advances in technology and responding to changing health

requirements and situations in communities. As a developing economy, India is an adequate telemedicine contender, together with its vast population. The Indian administration is dedicated to delivering equivalent access to excellence health care at affordable costs and digital medical care is crucial to transforming the health system. Therefore, the integration of telemedicine into health systems reduces inequality and obstacles caused via distance. Additionally, it promotes the utilization of digital technologies and payment mechanisms to improve the efficiency and performance of healthcare institutions. The utilization of telemedicine facilities in basic health centres is emphasized to enhance the system and eliminate the rural-urban gap that exists in the Indian setting for timely and optimal treatment.

Many of the world's major countries were in lockdown mode to control the spread of the new Coronavirus illness (Covid-19 pandemic) while allowing only critical operations to continue. Last year, on March 24, 2020, the GoI, led by Prime Minister Narendra Modi, declared a countrywide lockdown for 21 days, which was later prolonged. During this time, patients' mobility was restricted, and all outpatient departments (OPDs) were closed, making it especially difficult to manage patients with chronic illnesses. MoHFW, in cooperation with NITI Aayog, released formal **guidelines for telemedicine** practice in the country.

These were designed to allow registered physicians to consult remotely in the Indian Medical Council's Supersession. The recommendations give details on many elements of telemedicine technology policies and instruments accessible to health experts, as well as ways to incorporate these technologies into health care supply. It also focused on ways speech, data, pictures, and information technology can be utilised in combination with other medical criteria, rules, guidelines, and practices while providing treatment.

The article refer to rationalization of thought and use of telemedicine where it is clinically acceptable, safe, and successful, and adds a beneficial modality to patient care. Telemedicine Technology, similar to any additional expertise, maybe misused. There are dangers, disadvantages, and limits that may be reduced with adequate training and the implementation of standards, procedures, and guidelines. This document was urgently needed since there was widespread concern regarding the use of telemedicine, and the lack of clear rules generated significant uncertainty.

4.3 Literature review

Ministry of Health and Family Welfare (2020) - In the aftermath of the epidemic, the regulatory body in super Session to Indian Medical Council released the first formal paper addressing standard procedures and practices to be followed by clinicians for effective patient treatment.

Ghosh et al (2020) - The study's objective is to demonstrate the relevance of telemedicine in managing chronic diseases like diabetes in patients who are under lockdown.
It was especially useful when patient-doctor movement was halted. The government's clear instructions also assisted. An overall feasibility analysis is presented.

Chauhan V et al (2020) - Telemedicine providers can remotely identify patients who may require additional escalation of treatment using customized techniques. Thus, telemedicine can assist in triaging patients to ensure that hospitals, emergency departments (EDS), and clinics are used appropriately. Telemedicine was used efficiently by one of Israel's medical centers to care for the 12 Israelis. Patients with covid-19 were acquired from a cruise ship that was confined in Japan for many weeks. Overall, telemedicine should be embraced and promoted to protect healthcare professionals and high-risk patients.

Dasgupta. A Soumya Deb. S (2008) - The telemedicine industry has advantages, such as access to remote areas, reduced patient transport time and costs; disease surveillance and program tracking and disadvantages such as medical professionals' perspective, fear, and anxiety for patients and literacy rates - suggests that an intelligent compromise should be reached between complete dependence on machinery and human intelligence. This can help save a person's life.

Kapoor. A et al (2020) - For screening and management of Covid-19 cases and non-Covid-19 cases the telemedicine was employed which decreased the burden on the hospital dramatically. The advancement of digital health approaches, such as integrated monitoring networks, telehealth technologies, innovative diagnostics, and therapeutic decision-making techniques, broader wearable systems for physiological parameters, and the creation of open chat platforms for public knowledge dissemination of Covid-19 have been supported by healthcare technologies.

4.4 Objectives

The main objective of this study was to discover the current knowledge, perceptions, and practices of telemedicine in Indian healthcare delivery due to its interesting aspect of changing healthcare. Weather It has resulted in a paradigm shift away from old approaches and toward innovative Information and Communication Technologies (ICT), allowing digital health for everybody and transforming the health system. The objective is also to identify the probability of an individual's preference for using these services in the future, as telemedicine becomes more prevalent. Especially after a year of the Covid pandemic, how people have reacted to the usage of telemedicine, and can it be new normal to continue living healthy lives.

4.5 Methodology

This is a research design of 116 Indians' perceptions, awareness, knowledge, and experience levels connected to telemedicine services, as well as different social-demographic factors. Using Google Forms, an online semi-structured questionnaire was created, along with a permission form. The questionnaire link was distributed to the general population of India via e-mail, WhatsApp, LinkedIn, and other social media platforms. Participants were automatically routed to information about the survey and notified approval after receiving and clicking the link. Then a series of questions came in a sequence, which the participants were supposed to answer.

It was a web-based survey. Participants with internet access could take part in the study. Participants had to be over the age of 18, able to comprehend English, and ready to provide updated permission. We received statistics from thirteen Indian states/UT. Age, gender, education, domicile, and area of residence were among the socio-demographic factors examined. The investigators created an online self-reported questionnaire that included questions on telemedicine awareness and online consultation.

Descriptive Cross Sectional study was done to measure public opinion on telemedicine services, and the results were analysed in the report. For statistics assessment, MS-Excel for record amplification, and afterward, IBM SPSS version 26.0, for explanatory and illative statistical assessment of data was sourced.

4.6 Findings

This is a research design on telemedicine service perception, understanding, awareness, and experience levels, as well as several social-demographic variables. There was a total of 116 replies. All the participants were over the age of 18 and Indian descent. Participants in the research were limited to those who could communicate in English and had admittance to the web. As a result, persons with a greater degree of education were involved in the research by default. The least educational stage recorded in this survey was Higher secondary. Graduation or above was the highest qualification held by more than 91.4% of the population. The participants' ages ranged from 18 to 45 years old on average. There were 65.5 % females and 34.5 % men among the participants. Participants came from 84.5 % of metropolitan regions, 10.3 % from semi-urban areas, and 5.2 % from rural areas. The contestants are from the country's Thirteen states or union territories, with Uttar Pradesh having the most representation, followed by Himachal Pradesh, Maharasthra, Gujarat, and Delhi. Approximately 67 % of participants had heard of the terms telemedicine, online consulting, and teleconsultation.

4.6.1 Part-1: Secondary Research Findings:

Due to the COVID-19 outbreak, the Indian Government has come up with telemedicine Practice Guidelines on 25 March 2020. MoHFW issued guidelines in cooperation with NITI Aayog and the Indian Medical Council of the Board (MCI) of Governors (BoG). The salient features of the guidelines were:

- Anyone registered in the State Medical Register or the Indian Medical Register under the Indian Medical Council Act, 1956 is eligible to practise telemedicine, according to the stated guidelines.
- All registered medical practitioners (RMP) must complete a required course created by MCI in the interior 3 years of the guidelines' adoption.
- RMP can advise patients using text, audio-enabled, or video solutions. Both the patient and the doctor must be aware of each other's identities. The doctor should verify the patient's identity by asking necessary information. The doctor should be sure of the patient’s age before prescribing any medication. In case of any doubt, the doctor can ask for age proof from the patient. The consent is implied if the patient is initiating the consultation.

- The doctor should not proceed until a physical exam is performed if a physical examination is relevant for the consultation. There are limits based on the sort of drug that can be prescribed, the type of consultations.
- The List B drugs may not be recommended until a follow-up session or in person. For example, over-the-counter medicines and medicines are included under List O and can be prescribed by any method of consultation. The Government also specified in the 1985 Medicines and Psychotropic Substances Act Schedule X and the Regulations, and any drugs and psychotropic substances not prescribed through teleconsultation.

Dr. H S Chhabra, Chief Coordinator and Editor of ElearnSCI.org stated that a real boost to teleconsultation was observed after the covid pandemic despite it being available in the public domain since 2017.

Rajat Garg, CEO and Co-Founder of myUpchaar, agreed that ehealth had been around for a while, but the Corona epidemic has brought it to the forefront. The convenience of receiving physician consultations and drug delivery without getting out of bed may be both appealing and soothing.

Saurabh Arora, Founder and CEO of Lybrate said, “As it is dawning upon people how unsafe it is to step out, pregnant women are opting to consult doctors online, resulting in a significant rise in virtual doctor visits on Lybrate.”

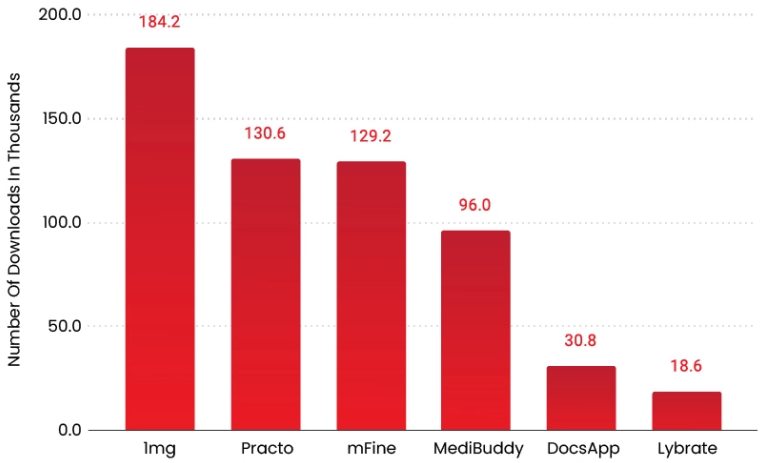
According to reports, In March 2020 itself, more than 50% of E-consultation was related to Covid mostly in the age group of 24-40 of which 30-35% were females.

As per latest Inc42 Plus study labelled “India's eHealth Market Opportunity Report, 2021”, The telemedicine industry is forecasted to increase $5.4 billion by 2025, increasing at a CAGR of 31%.

As per Kalagato's report noticing traffic of smartphone operators, E-drugstores such as PharmEasy and Netmeds noticed double increase in DAU in April 2021. Practo, which deals audio-visual sessions and digital prescriptions, nearly tripled its daily average users from less than 2.5 percent to more than 7 percent.

1mg Had The Highest Number Of Downloads In The Telemedicine Sector Post-Covid-19

Lybrate had the least number of downloads post-Covid-19



Note: Downloads are considered from Jan 1 to Feb 10, 2021
Source: AppTweak

Inc42 Plus

Who Stands Where In The Telemedicine Sector

Startup	Launch Year	Presence	Types Of Services	Number Of Healthcare Providers On The Platform
practo	2008	15 Countries	Teleconsultation, Online Diagnostics, Online Pharmacy	2,00,000
1mg	2012	1,000+ cities	Teleconsultation, Online Pharmacy, Healthcare Products, Online Diagnostics	15,000+
myupchar	2016	200+ cities	Teleconsultation, Online Pharmacy, Healthcare Products, Online Diagnostics	50,000+
lybrate	2013	80 cities	Teleconsultation, Health Information	1,00,000
doc:prime	2018	40 cities	Teleconsultation, Online Diagnostics	30,000+
mfine	2017	5 cities	Teleconsultation, Online Diagnostics	3,500+

Source: Industry Articles, Company's websites

Inc42 Plus

Government Initiative:

November 2019, MoHFW to enhance admittance to healthcare facilities and its reachability in the remote areas assigned Centre for Development of Advanced Computing (C-DAC) in Mohali, to develop a platform on 25th March 2020 when the MCI and NITI Aayog jointly published the telemedicine practice guidelines. These guidelines enable RMPs to offer health care remotely employing digital platforms. Soon after, on 13th April 2020, MoHFW department launched eSanjeevani, a platform that offers remote health services.

eSanjeevani completed 50 lakh consultations (by May 2021) with daily approximately 40,000 patients. The leading ten states with the maximum sessions through eSanjeevani and eSanjeevaniOPD portals are:

- Tamil Nadu (1044446)
- Karnataka (936658)
- Uttar Pradesh (842643)
- Andhra Pradesh (835432)
- Madhya Pradesh (250135)
- Gujarat (240422)
- Bihar (153957)
- Kerala (127562)
- Maharashtra (127550)
- Uttarakhand (103126)

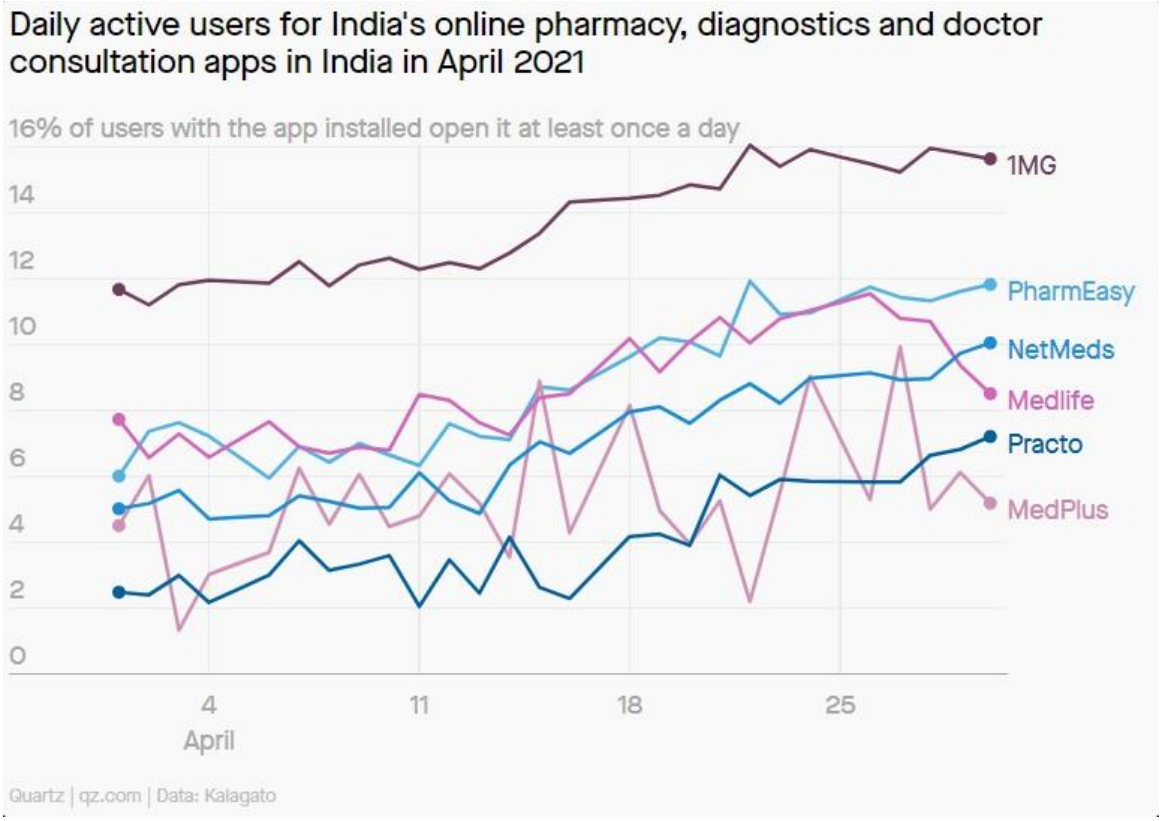
  Source: ANI 13th May 2021 release

The platform is available in the following two variations:

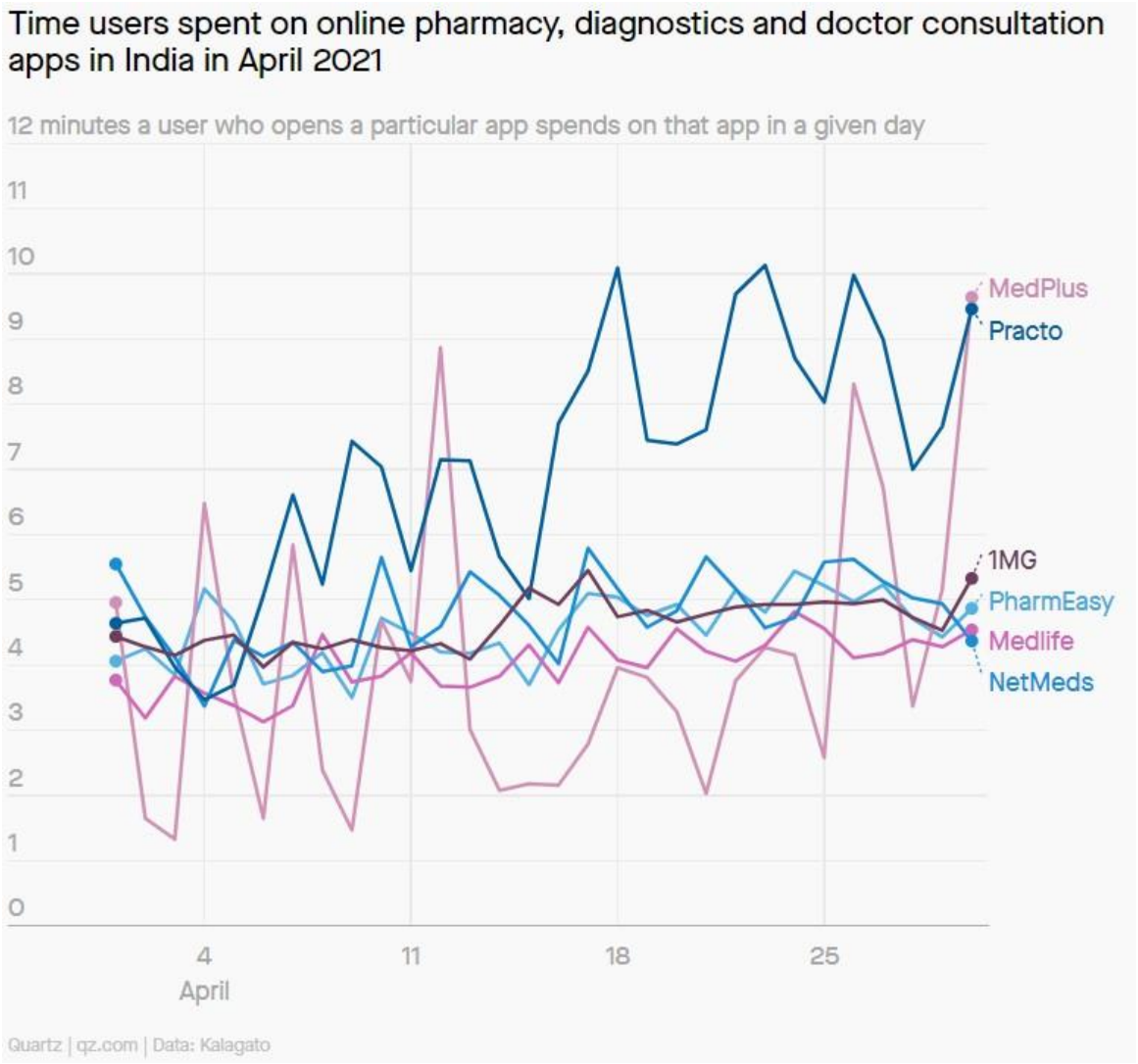
- Doctor-to-doctor teleconsultations, provided through eSanjeevani Ayushman Bharat–Health and Wellness Centres (AB-HWC): This is deployed in 6,000 HWCs and is attended by professionals and physicians in all over 240 centers. More than 20,000 medical assistant, physicians, and experts received training to operate eSanjeevani AB-HWC.
- Doctor-to-patient teleconsultations are provided free of cost through the eSanjeevaniOPD platform: eSanjeevaniOPD enables contactless consultations between a doctor and a patient. Approximately 8,000 doctors received training and were onboarded on eSanjeevaniOPD.

Initially, the portal was intended to connect physicians from government medical institutions with employees from local health facilities for training. It was restructured as a non-profit healthcare portal just as Covid's cloud approached Indian borders, with the federal government introducing its latest incarnation in April 2020.

The concentration on online health services comes amid while India is seeing about 400,000 new Covid-19 cases daily basis, forcing lockdowns across over a dozen states. Several other states have certain restrictions on movement. Meanwhile, most hospitals and clinics have shuttered their outpatient departments and are postponing routine inpatient treatments and elective surgeries. Furthermore, several pharmacies are said to have run off from supplies.



Indians utilize programmes relating to healthcare more often, but spend considerably more time on them as well. In April, time spent on Practo and MedPlus online pharmacies rose by about 200%.



Although many Indians do not still have Internet connection and do not have personal gadgets, most of these services do not have any support. Another obstacle for many is the lack of working understanding of English. According to the Kalagato study, 90 percent of new internet users in India communicate in their native language.

Practo added support for 15 Indian regional languages in early April. Dolly Arjun, a Boston-based physician, established helpline particularly for economically unfortunate indigenous communities, and she has covered native language interpreters for patients in India. Furthermore, the hotline has been buzzing nonstop for BigOHealth, a Hindi-language app aimed at rural Areas, that were mostly unscathed by the first wave but then was seriously damaged by the latter.

Future, Research and Development Areas in Telemedicine:

- **Paramedicine Solutions**: Emergency responder play an important role in healthcare system since they are on the frontline of saving lives. To offer treatment more quickly, the hospital will use telemedicine technologies to connect paramedics with intensivists, cardiologists, and neurologists. Even before patients are put into an ambulance, paramedics will utilise such a technology to communicate with top specialists. Furthermore, paramedics will assist in determining whether a lower activity destination is more suited for the patient's needs. As a result, the usage of para-telemedicine will result in cost savings and will assist the team in avoiding needless travels.
- **Use of AI-Integrated Software**: Many sectors have been transformed by artificial intelligence, and healthcare is no exception. A growing number of healthcare providers will use AI-based software for a variety of objectives, ranging from detecting skin cancer from skin scans to detecting pulmonary nodules and chest X-rays. After obtaining basic information, such software may be used to determine the appropriate next steps or set of questions to ask a patient.
- **Cyber Security** : As telemedicine becomes more popular in India, data security will become a major issue for service providers. As a result, more research and development in the cyber security field is required in order to avoid database breaches and other types of hacking. Few cyber security products depend on artificial intelligence algorithms to detect suspicious behaviour in real time. It also enables system administrators to not only respond to issues but also to proactively prevent them. Since a data breach might result in enormous costs, service providers would be well to invest in cyber protection.
- **Insurance Coverage For Remote Health Areas**: Insurance coverage for tele-health services and remote patient monitoring will be of importance to governments seeking to cut healthcare costs while guaranteeing that their citizens receive care even in difficult circumstances.
- **Managing resources with digital technology:** With a lack of healthcare professionals in rural regions, healthcare centres equipped with technology can overcome service delivery gaps in underserved populations. Telemedicine services and a suitably qualified CHW or local community nurse can act as a mediator

between users and Doctor who appears on a laptop or mobile phone screen, in these centres.

- **Business model and bundling services:** To address the sustainability difficulties of servicing individuals at BOP, digital health businesses are combining digital health offerings, which are frequently a combination of telemedicine, microinsurance, and teleinformation services, among others. Other businesses are merging business strategies and creating solutions for various consumer segments with variable purchasing power. Such businesses provide services across the B2C, B2B, and B2G business models to minimise the problems that come with only serving BOP consumers, a less profitable and more difficult to reach market.

- To envision more diverse service options on the eSanjeevaniOPD platform, we benchmarked teleconsultation services given by eSanjeevani, Practo, and 1mg in India, Ping An Good Doctor (PAGD) in China, and Amwell and Teladoc in the United States. These platforms provide online consultations, e-health profiles, swift drug delivery, health management plans, appointment services, health check-ups, hospital referrals, second opinions, inpatient arrangements, and local or international medical services.

Services	Mode	eSanjeevani	Practo	1mg	PAGD	Teladoc	Amwell
Online consultation	Online	✓	✓	✓	✓	✓	✓
e-health profile	Online	✓	✓	✓	✓	✓	✓
Express drug delivery	Online	✓	✓	✓	✓	✗	✗
Health plans	Online	✗	✓	✓	✓	✓	✓
Appointment services	Offline	✗	✓	✗	✓	✓	✗
Health check-up	Offline	✗	✓	✓	✓	✓	✗
Hospital referral	Offline	✗	✓	✓	✓	✓	✗
Second opinion	Offline	✗	✗	✗	✓	✗	✗
Inpatient arrangement	Offline	✗	✓	✓	✓	✓	✗
Domestic/ overseas services	Offline	✗	✗	✗	✓	✗	✗

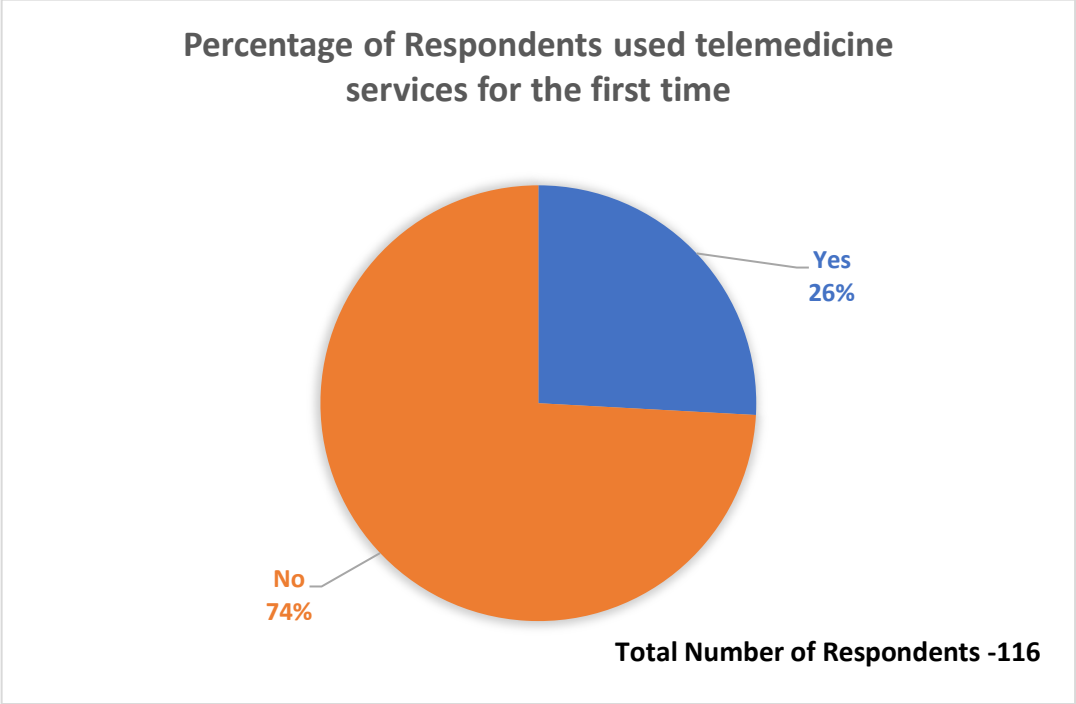
As the benchmarking survey indicates, there is an unrealized possibility to develop eSanjeevani into a world-class teleconsultation platform. This is made feasible by incorporating it into the wider healthcare ecosystem, which connects hospitals, clinics, pharmacies, labs, diagnostic centers, and doctors who provide in-person consultations. This might be explored through the GoI, National Digital Health Mission (NDHM).

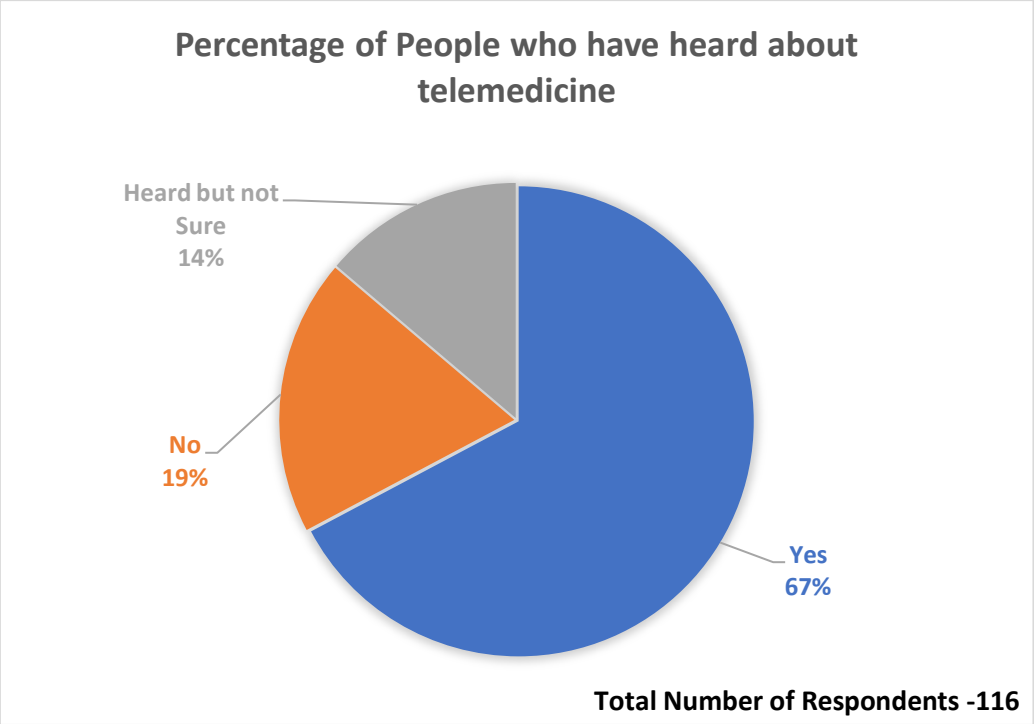
4.6.2: Awareness and Knowledge towards Telemedicine Services

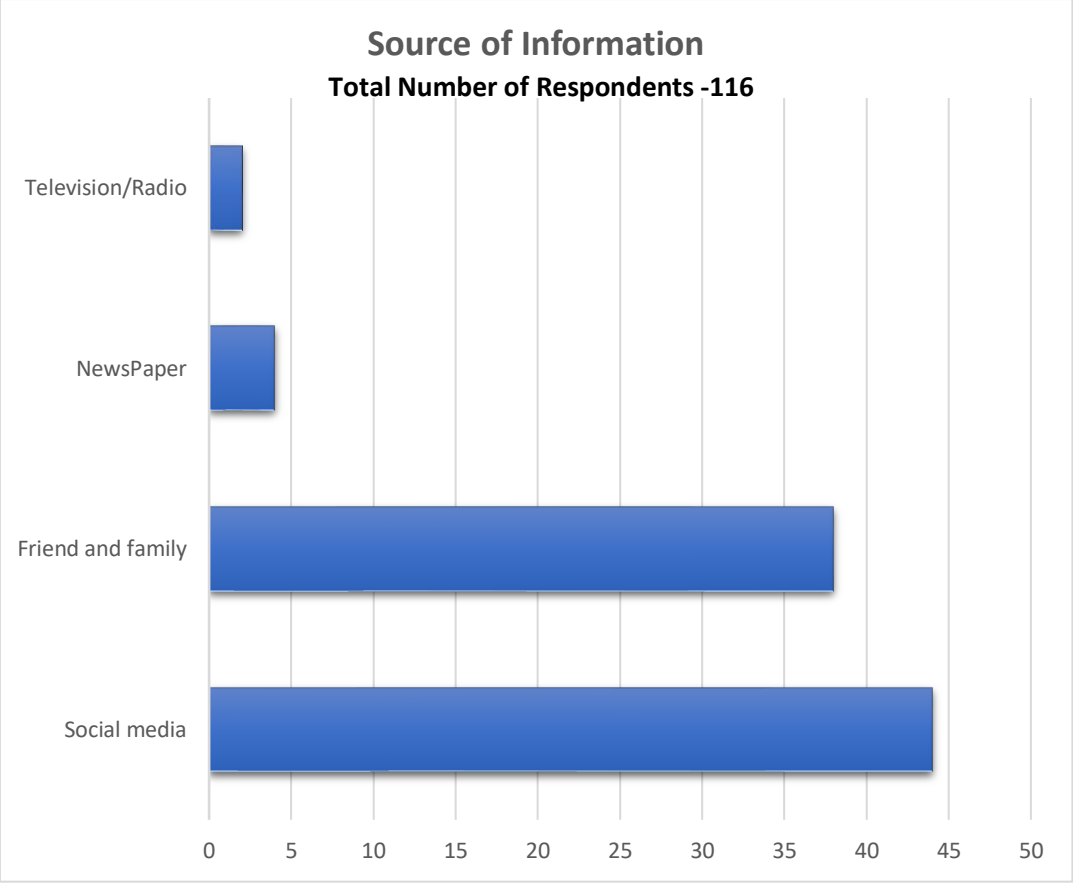
Of individuals here, 67.2% were aware of online consultation, where social media 62.1% played a pivotal role in spreading awareness about multiple lockdowns and word of mouth from friends and family 51.7% was significant.

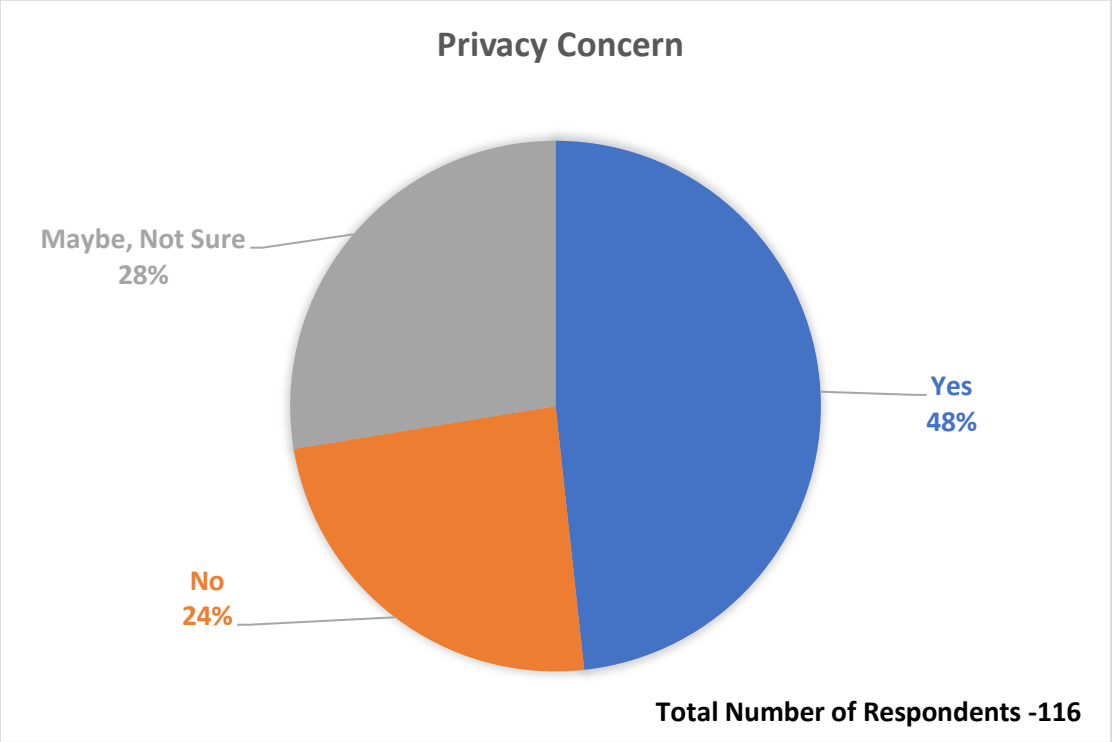
25.9% of individuals opted for online consultancy rather than visiting a hospital, and 37.9% expressed their interest in taking online consultation next time, and 46.3% would refer it, which is evident from awareness from friends and family. Also, 48.3% raised concerns about the privacy of their data and have concerns regarding it. Even with all this, this is a positive step and promising for the industry.

Looking at their experience of the session, most of them consulted with general doctor 32% via Private online players 18% such as NetMeds, Practo, etc. major challenges were Poor diagnosis, they were keen to meet them personally and lacked personal touch in diagnosis 17%, whereas 5% was not comfortable and 2% face connectivity issues. However, more than fifty half percent of individuals never took online consultation, which remains potential clients in the future.

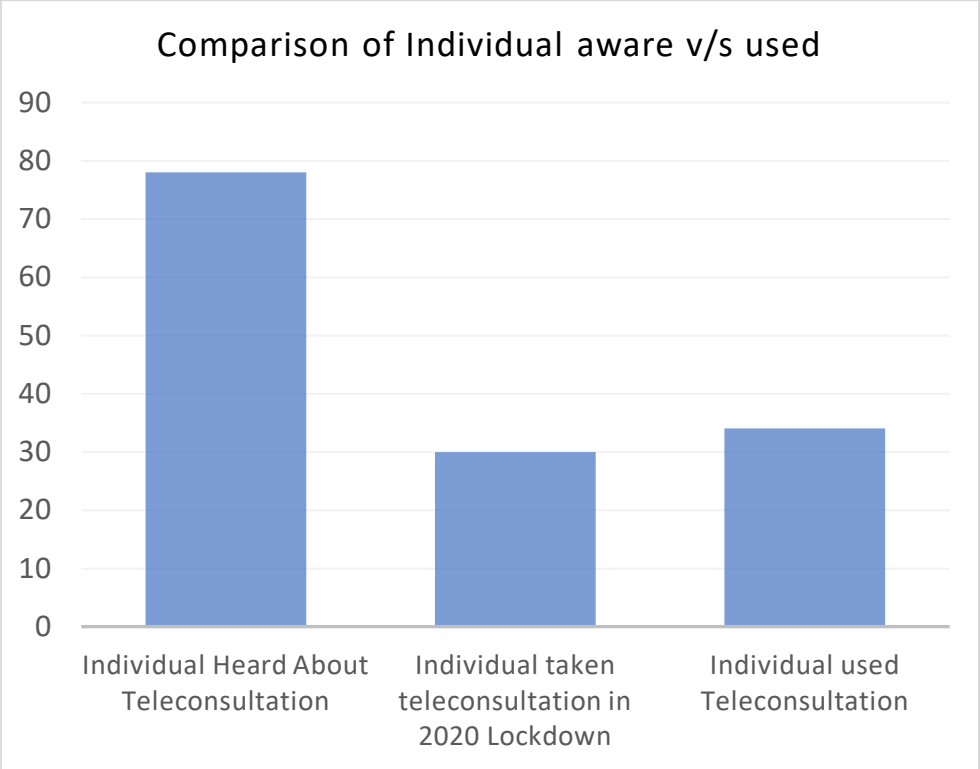

Percentage of Respondents used telemedicine services for the first time
Yes
26%
No
74%
Total Number of Respondents -116

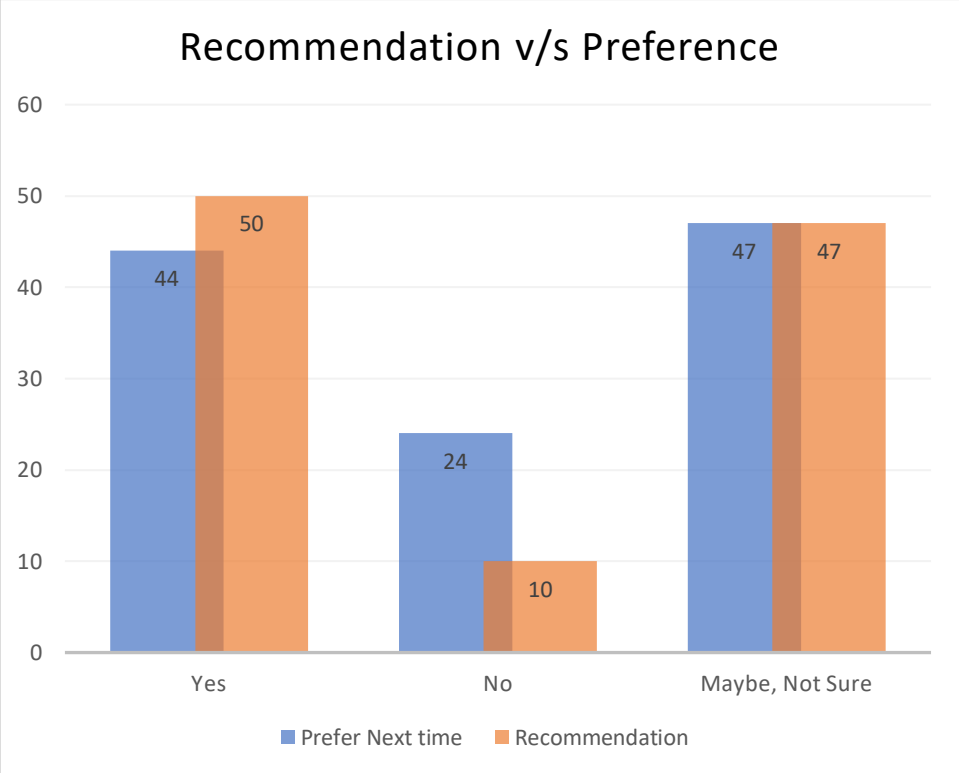

Percentage of People who have heard about telemedicine
Heard but not Sure
14%
No
19%
Yes
67%
Total Number of Respondents -116

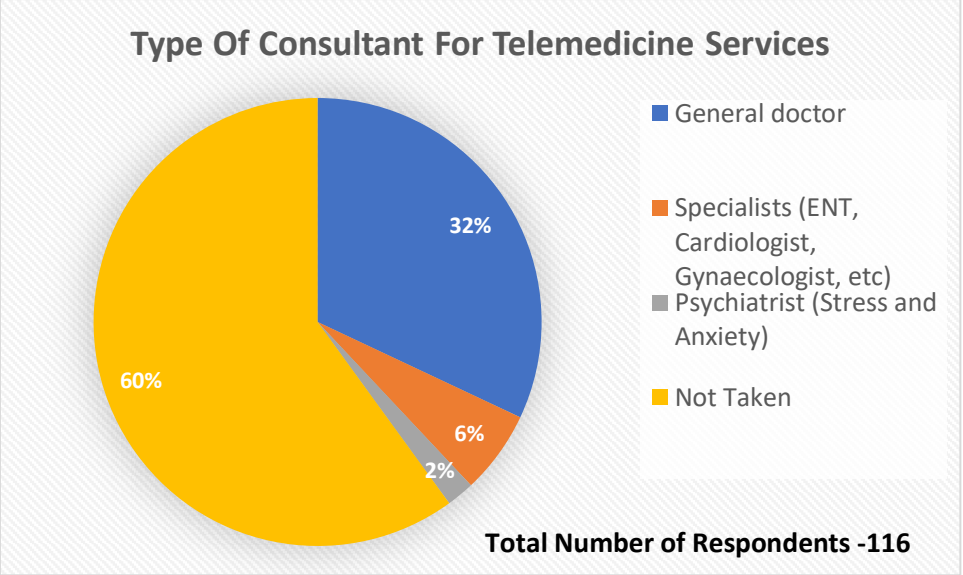

Source of Information
Total Number of Respondents -116
Television/Radio
NewsPaper
Friend and family
Social media
0
5
10
15
20
25
30
35
40
45
50

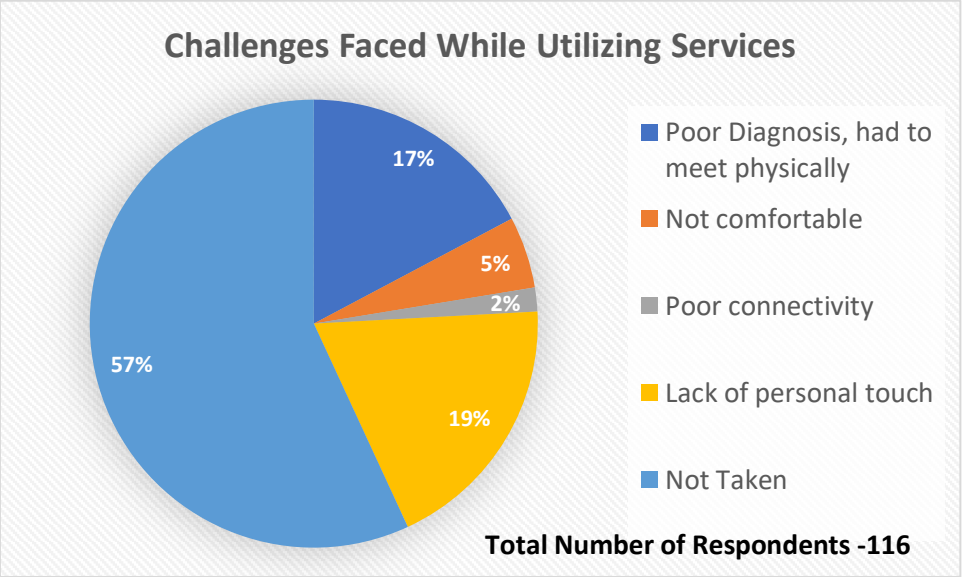

Privacy Concern
Maybe, Not Sure
28%
Yes
48%
No
24%
Total Number of Respondents -116

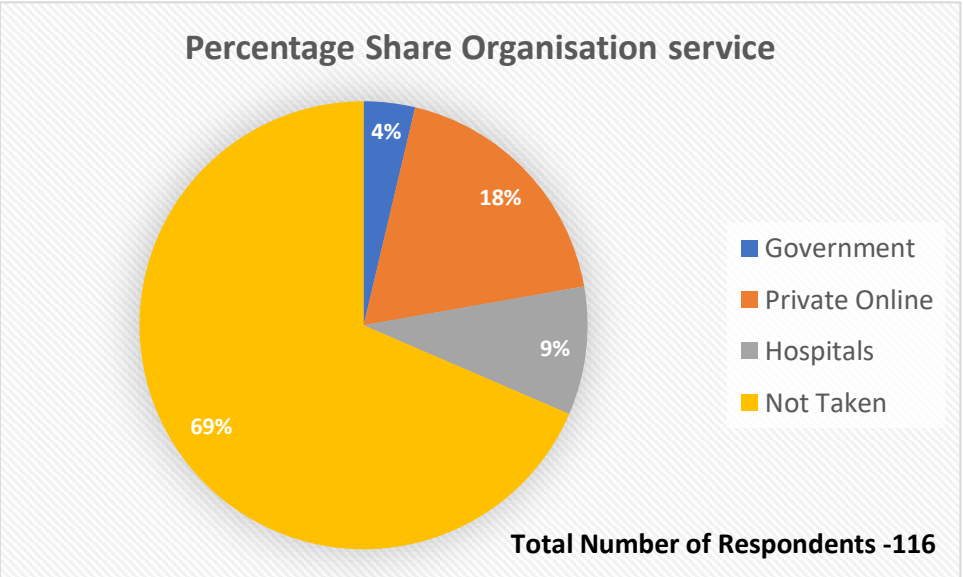
Total Number of Respondents -116






Type Of Consultant For Telemedicine Services
32%
6%
2%
60%
General doctor
Specialists (ENT, Cardiologist, Gynaecologist, etc)
Psychiatrist (Stress and Anxiety)
Not Taken
Total Number of Respondents -116


Challenges Faced While Utilizing Services
17%
5%
2%
19%
57%
Poor Diagnosis, had to meet physically
Not comfortable
Poor connectivity
Lack of personal touch
Not Taken
Total Number of Respondents -116


Percentage Share Organisation service
4%
18%
9%
69%
Government
Private Online
Hospitals
Not Taken
Total Number of Respondents -116

4.6.3: Cluster analysis of responses

Total Number of Respondents -116

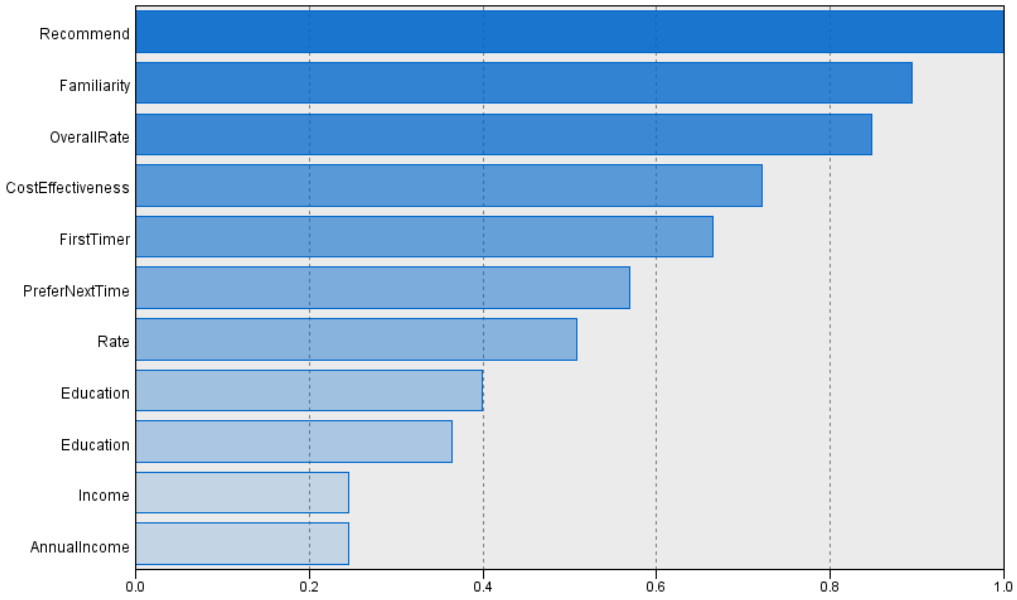
Clusters

Input (Predictor) Importance

1.0 0.8 0.6 0.4 0.2 0.0

Cluster	1	2
Label		
Description		
Size	60.3% (70)	39.7% (46)
Inputs	Recommend 3.37	Recommend 2.13
	Familiarity 2.86	Familiarity 2.04
	OverallRate 3.77	OverallRate 2.74
	CostEffectiveness 3.46	CostEffectiveness 2.35
	FirstTimer 1.43	FirstTimer 1.00
	PreferNextTime 2.29	PreferNextTime 1.48
	Rate 3.51	Rate 2.74
	Education 2.83	Education 2.35
	AnnualIncome 5-10 lakh (62.9%)	AnnualIncome 5-10 lakh (78.3%)
	Gender Female (74.3%)	Gender Female (52.2%)
	Area Urban (91.4%)	Area Urban (73.9%)
	Privacy 2.26	Privacy 2.13

Predictor Importance

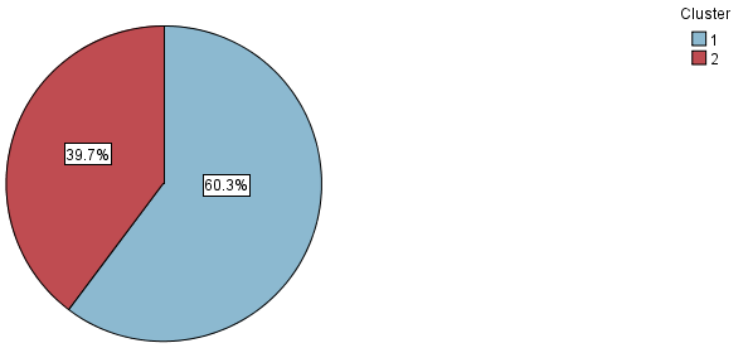


Least Important

Total Number of Respondents -116

Most Important

Cluster Sizes



Size of Smallest Cluster	46 (39.7%)
Size of Largest Cluster	70 (60.3%)
Ratio of Sizes: Largest Cluster to Smallest Cluster	1.52

Model Summary

Algorithm	TwoStep
Inputs	12
Clusters	2

Cluster Quality

Centroids

		Education		Familiarity		FirstTimer		Privacy	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Cluster	1	2.83	.450	2.86	.352	1.43	.498	2.26	.811
	2	2.35	.766	2.04	.868	1.00	.000	2.13	.909
	Combined	2.64	.638	2.53	.727	1.26	.440	2.21	.850

Rate		PreferNextTime		Recommend		OverallRate		CostEffectiveness	
Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
3.51	.880	2.29	.887	3.37	.904	3.77	.837	3.46	.912
2.74	.743	1.48	.658	2.13	.806	2.74	.743	2.35	1.016
3.21	.909	1.97	.894	2.88	1.056	3.36	.945	3.02	1.095

Cluster analysis made two clusters,

While comparing the mean of the First and second clusters, the first cluster consists of people from urban areas with higher income, education than the second Cluster. Most of the cluster members in cluster 1 are females, due to all these advantages cluster 1 individual were more aware, used teleconsultation more post march 2020, their experience was also better and they found their respective session cost-effective, which ultimately resulted in a

favor of using these services next time and recommending them in their friend circle. Both faced the same amount of concern over the data privacy of online platforms, still, they were optimistic and were ready to make this new normal.

5. Discussion and Recommendations

- As sexual harassment of female doctors on the pretext of taking advice is a major issue, as no proof of identity is asked in the registration process and a simple OTP verification process is employed. One way to address this issue is implementing Aadhar verification and match patients and doctors algorithmically based on gender.
- Telemedicine systems rely heavily on a stable internet connection, sessions that are disrupted are likely to fail. A capability to record symptoms through text/voice note can be included to ensure the session's success.
- More than half of the population is still digitally excluded in remote areas which results in the poor execution to underutilization of teleservices. Its reachability can be ensured by government in collaboration can create community-based local centers equipped with tablets and mobile (panchayat offices) devices self-help groups.
- Awareness of telemedicine can be generated to lessen the burden of OPD hospitals. Those visiting OPD should be informed about teleservices. Many of them can take follow up treatment from their respective locations.
- Patient privacy, database management, and confidentiality must be also preserved through awareness of telemedicine services. These activities will encourage people to telecommunicate.

6. Conclusion

The foundation of telemedicine may be observed at the beginning of the twenty-first century, but its dawn did not come until this Covid outbreak. This was due to a variety of factors, most of which were political willingness that is evident over the course of time on a policy level. There was a dearth of laws and regulations governing telemedicine operations, but with this pandemic, the GoI issued long-overdue guidelines, which provided a similar boost to the digital health sector as demonetization did to online payment services.

History is repeating itself, and private players like Practo, 1mg, and others are seeing high demand for their services.

Not only did the GoI establish standards for telemedicine practice, but it also took efforts to ensure that these services are available to financially deprived members of society. In 2021, a year after the emergence of covid, not only private players but also the government-backed platform eSanjeevani are offering services across the country. Though there are obstacles such as language barriers, reachability, awareness, and availability, the most major concern is harassment with female doctors, which must be rectified.

With events such as the auction of 5G bands and investments in satellite internet, current 4G technology will become more affordable, and with the collaboration of private companies such as Jio and Google, access to devices and the internet will be extended to a larger segment of society, particularly those living in remote areas. All that is needed is to improve present services on a policy and execution level, as well as to raise awareness and encourage people to utilise them. More such cooperation, good moves in the right direction, and policy execution will enable the coexistence of telemedicine services with hospital services and their maximum extensibility.

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