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at

Viveo Health India

Title- Evaluating Barriers to Adopt Telemedicine in Developing Countries

by

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ENROLLMENT NO- PG/19/062

UNDER THE GUIDANCE OF

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PGDM (Hospital and Health Management)

2019-21

International Institute of Health Management Research

New Delhi

Completion of Certificate from the Organization- Viveo Health India

The certificate is awarded to

Name- Dr. Prakamya Arora

In recognition of having successfully completed her

Internship in the department of

Sales and Marketing

and has successfully completed her Project on

Evaluating Barriers to adopt Telemedicine in Developing Countries

Date- 1st June, 2021

Organization- Viveo Health India

She comes across as a committed, sincere & diligent person who has

a strong drive & zeal for learning.

We wish her all the best for future endeavors.

Prasant Mohanty

Director

Viveo Health India Pvt Ltd

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Prakamya Arora student of PGDM (Hospital & Health Management) from International Institute of Health Management Research New Delhi has undergone internship training at Viveo Health India from 1st March to 31st May.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

Ms. Divya Aggarwal
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Mentor- Dr. A.K. Khokhar
Adjunct Professor
IIHMR, New Delhi

Certificate of Approval

The following dissertation titled “Evaluating Barriers to adopt Telemedicine in Developing Countries” at “Viveo Health India” is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for a award of PGDM (Hospital & Health Management)for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

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This is to certify that Dr. Prakamya Arora, a graduate student of the PGDM (Hospital & Health Management) has worked under our guidance and supervision. She is submitting this dissertation titled "Evaluating Barriers to adopt telemedicine in developing countries" at "Viveo Health India" in partial fulfillment of the requirements for the award of the PGDM (Hospital & Health Management).

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

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INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH,

NEW DELHI

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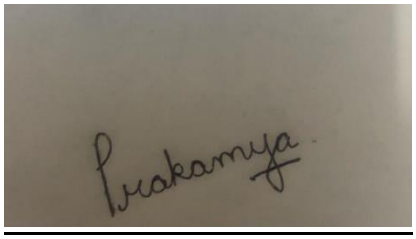
This is to certify that the dissertation titled Evaluating Barriers to adopt telemedicine in developing countries and submitted by Dr. Prakamya Arora, Enrollment No. PG/19/062. Under the supervision of Dr. A.K. Khokhar, for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 1st March to 31st May embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institutions of higher learning.



Signature

FEEDBACK FORM

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Dissertation Organization: Viveo Health India

Area of Dissertation: Evaluating Barriers to adopt telemedicine in developing countries

Attendance: Complete 3 months

Objectives achieved: Yes

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Suggestion for Improvement:

Suggestions for Institute (course curriculum, industry interaction, placement, alumni): There should be more sessions with Alumni's.

Prasant Mohanty

Signature of Organization Mentor (Dissertation)

Place: Mumbai

Date: 1st June 2021

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VIVEO HEALTH INDIA

One idea. One billion people.

Viveo Health started out as a big dream from the small country of Estonia. Over time, we realized we needed to broaden our horizons past Estonia since people all over the world are struggling to access healthcare. I'm proud to be able to wake up every morning and work together with amazing people who want to change the healthcare industry for good.

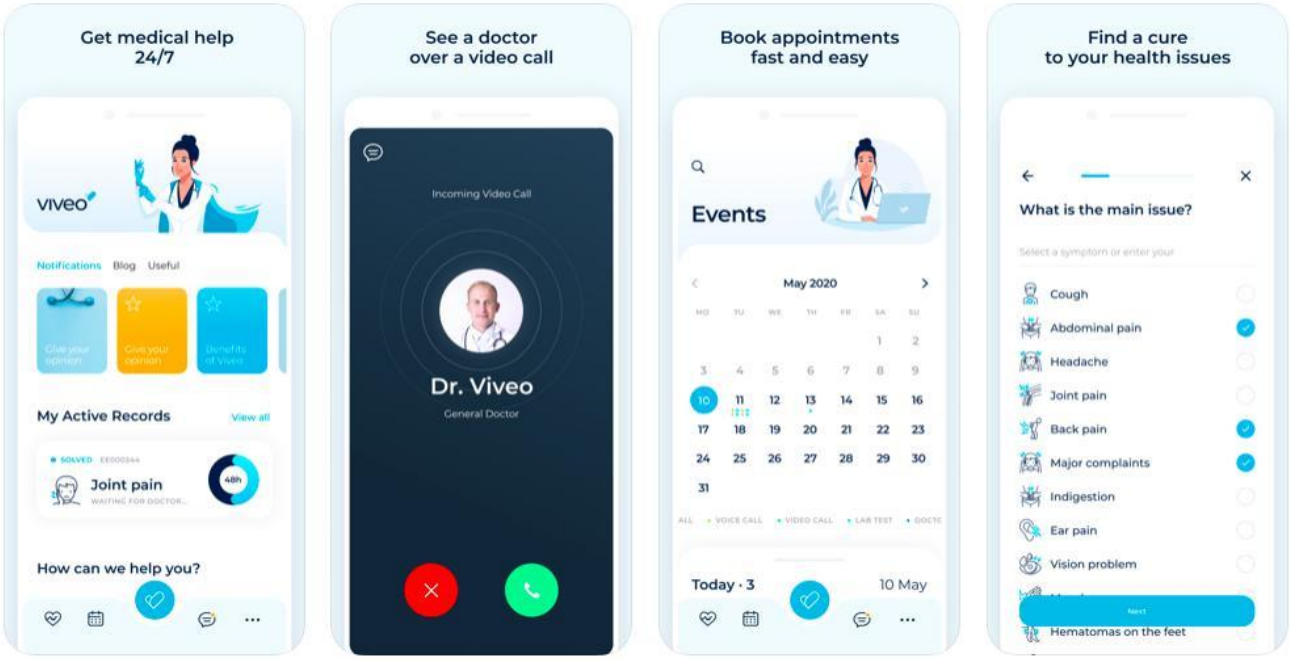
MISSION

To bring **healthcare** to one billion people by 2025.

VISION

To change how healthcare works, making it:

- Efficient
- Accessible
- Personalized
- Data driven
- Affordable



How does Viveo make my life easier and save my time?

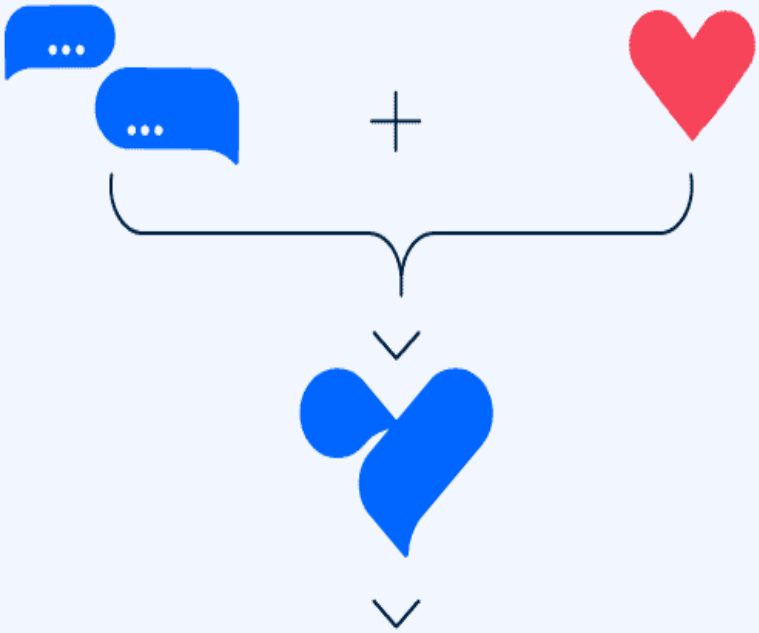
Our technology is your shortcut for a number of reasons:

- Instead of jumping between different softwares and spreadsheets, **you have everything you need in one place:** your calendar, invoicing and payments system, as well as your patients' health records and database.
- Instead of wasting time on commuting, you can **work from the safety of your home** or from anywhere you want — you just need to be online.
- Instead of personally contacting your patients to arrange appointments, follow ups and payments, you can leave it to **our smart scheduling system and built-in payment handling.**
- Instead of investing in various **cyber security solutions to avoid being hacked**, Viveo keeps you protected with its top encryption protocols — making it incomparably safer than e-consulting via standard email, text or video call

The Story Behind Viveo

Connecting people through meaningful dialogue

Bringing accessibility and inclusivity to healthcare



viveo

The name “Viveo” originates from *vivus*, the Latin word for life.

Our Personal Growth

2017
Viveo was founded

2 team members

2018

8 team members

2019-2020

35 team members

2 global offices

2021 | VIVEO TODAY

84 team members

8 global offices

Raul Källo
Founder, CEO

After a successful career in insurance business for **20 years**, Estonian Raul Källo decided to study the existing inefficiencies in healthcare

The result: creating a solution bundling all 3 needed services

- **virtual visits**
- **offline clinics**
- **private health insurance**

The Solution was then called **Viveo**, after Latin *Vivus* (lively)

Claims were reduced drastically

In 2019, founding team started to development a **proprietary telemedicine platform**

Our Uniqueness

ESTONIA FACTOR

Innovation, simplicity, & reliability

OUR PEOPLE

Global & experienced

OUR ECOSYSTEM

Over 200 clinics and healthcare providers

OUR SOLUTION

Fast, simple, secure

Global Presence

To help everyone, we need to be everywhere.

Consultation Setup Steps

1 Download the Viveo app

2 Fill out your details

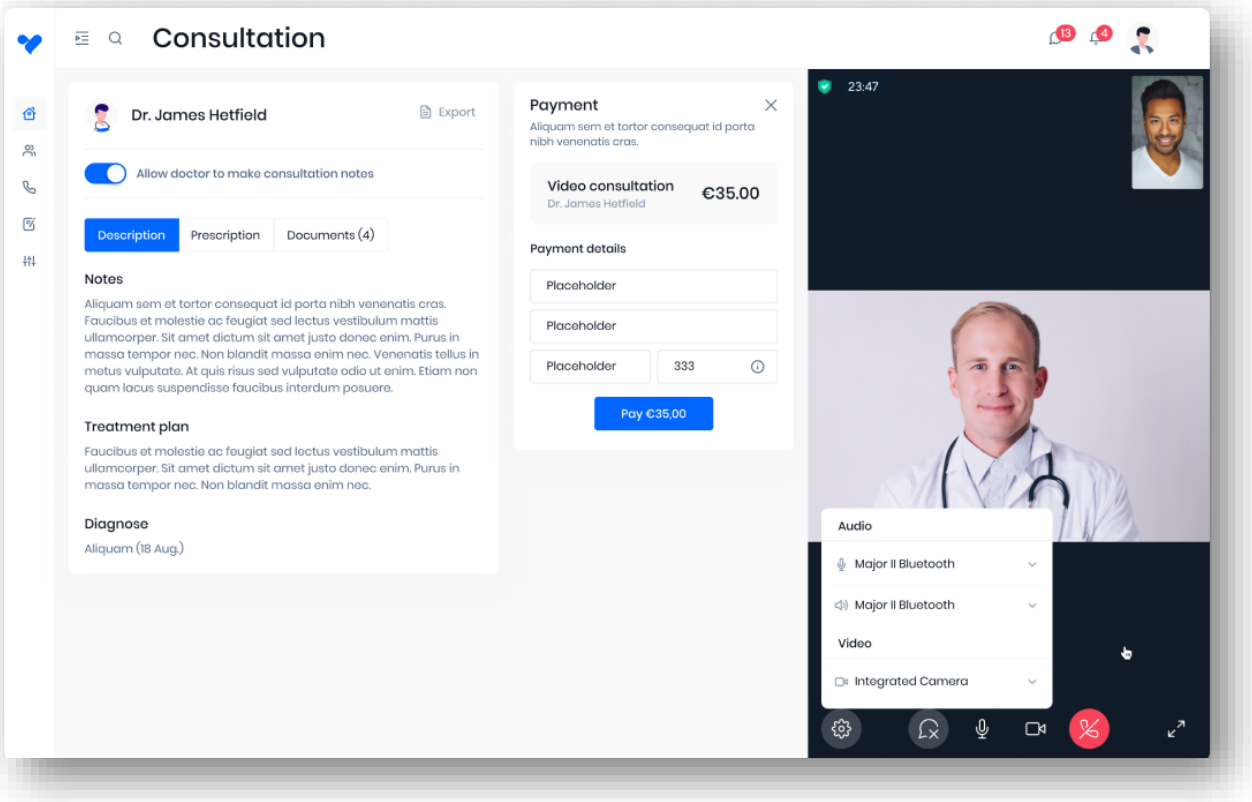
3 Choose a time for your consultation

4 Find a specialist that fits your needs

5 You’re all set for simple and secure health consultations

Viveo: a simple, convenient, and secure e-health platform

- With just a few clicks you can find a specialist and start up a remote consultation.
- Choose a doctor based on your schedule and skip the waiting room.
- Find and store all of your data and medical records safely in one place.



SECURE ENVIRONMENT

- GDPR Compliant
- Heavy duty data security
- End to end Video call and chat encryption

Viveo is FAST

Provide instant digital visits to your patients in just one click. Viveo has the fastest onboarding, which allows you to care for more patients in less time.

Viveo is SIMPLE

Access our user-friendly e-health platform from any device. No downloads are required. Viveo enables you to consult and treat patients anytime, anywhere.

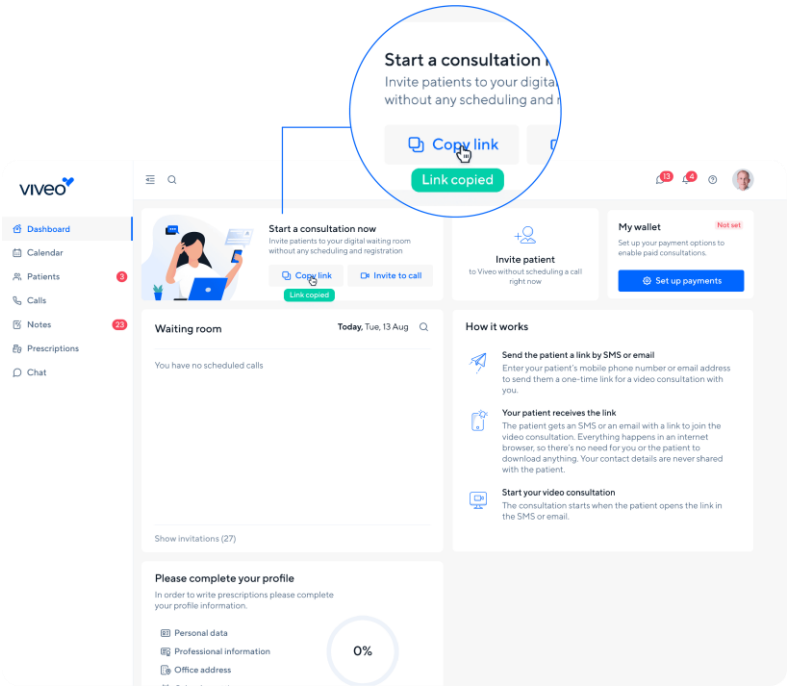
Viveo is SECURE

Keep all data, medical records, and personal details safely stored in one place. All transactions and payments are end-to-end encrypted

FEATURES

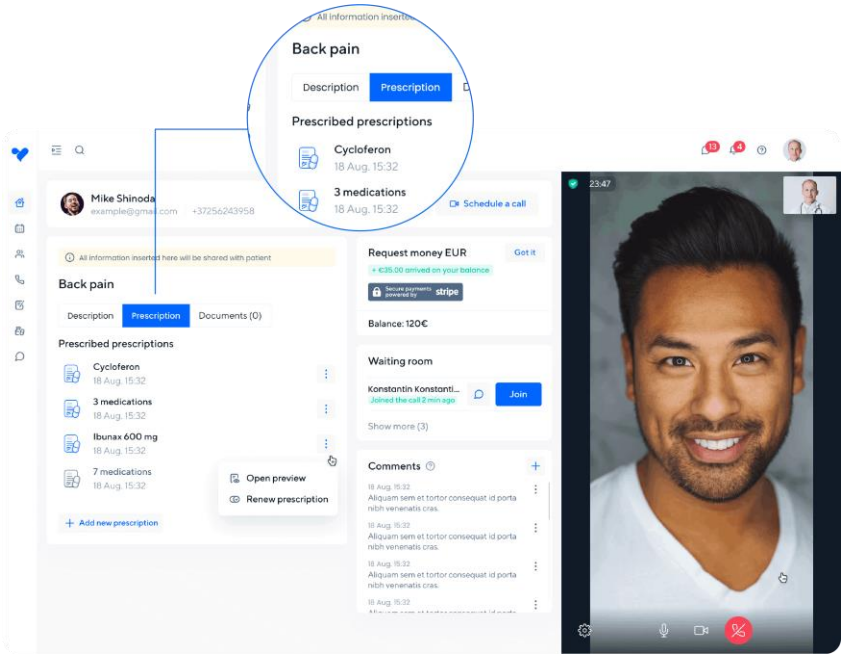
Digital Consultations

Manage your appointment schedule, patient data and medical records on one easy-to-use platform. Invite your patients to digital consultations by phone, video call or text, and start providing instant digital visits.



Digital Prescriptions & Chat

Take full advantage of our smart features like e-prescriptions and real-time chat. You can write digital prescriptions, notify your patients about new treatment plans, medications and appointments.



Collect Payments

Request and manage payments for your paid patient consultations with our built-in invoicing and payment system. All transactions are end-to-end encrypted and fully protected.

The Platform Provides Solution to

- **Doctors**

A complete e-health solution enabling doctors to digitally Consult with their patients.

- **Clinics**

Transform your traditional practice into a virtual clinic that fast, simple and secure.

- **Companies**

Create a healthy and happy workplace by offering employees unlimited access to healthcare.

Individuals

An easy-to-use solution for those who want to consult a medical specialist with just a click.

Collaborations

- Solar Energy Corporation of India Ltd. (SECI) is a company of the Ministry of New and Renewable Energy, Government of India, established to facilitate the implementation of the National Solar Mission (NSM). It is the only Central Public Sector Undertaking dedicated to the solar energy sector. The company's mandate has been broadened to cover the entire renewable energy domain and the company will be renamed to Renewable Energy Corporation of India (RECI).

- Edelweiss Broking Limited is an Indian Financial services company based in Mumbai, India. The company is a subsidiary of Edelweiss Group which was founded by Rashesh Shah. The company is registered with National Stock Exchange of India, Bombay Stock Exchange and MCX Stock Exchange.

- **ICMEA**, was founded in 2006 and is based in Corato (Ba) – Italy. Its core business is designing and developing innovative solutions to increase competitiveness in changing macroeconomic scenarios.
  ICMEA provides engineering services to several companies operating in the mechanical and energetic field, helping them to develop new products and finding smart solutions to improve performance.

- Sany Heavy Industry Co., Ltd. is a Chinese multinational heavy equipment manufacturing company headquartered in Changsha, Hunan Province. It is the 3rd-largest heavy equipment manufacturer in the world, and the first in its industry in China to enter the FT Global 500 and the Forbes Global 2000 rankings. Its founder and main shareholder is Liang Wengen.
  Sany is especially known for its concrete machinery, for which it is globally ranked No.

DISSERTATION REPORT

ABSTRACT

Introduction

Telemedicine is said to change the manner in which care is conveyed. Despite the fact that research broadly available on telemedicine hindrances in separated settings, a precise outline to sum up key logical commitments is absent. This paper plans to assess the deficiency with a deliberate survey of previously existing assessment.

Methodology

A structured literature review was undertaken from different databases which primarily include retrospective studies. This review only included articles that had been published in English language within last fifteen years. This literature review is performed to assess the available information on Barriers causing obstruction in implementation of Telemedicine in developing countries as well as the solutions that can be adopted to reduce these barriers

Research Topic

To determine the barriers which are causing hindrances to adopt Telemedicine in developing countries.

Result

Major obstructions for telemedicine execution were found and sorted relying upon the elements setting off the boundaries. These elements incorporate patient, medical care supplier, culture and illness (individuals related); wellbeing area, principles/rules, legitimate system, funds, organization and technique (measure related); also, technology (object-related). Suggestions are also given to remove the hindrances.

Conclusion

There is colossal tension on governments to give more reachable and quality medical care to its public. Only option and creative strategies like telemedicine can assist with satisfying this deficiency. These different hindrances referenced above are hindering the speed of extension of telemedicine. It is currently an ideal opportunity to limit the previously mentioned boundaries and the

constraints for the seamless development of a global telemedicine network for the growth of humanity.

KEYWORDS

- Telemedicine
- Barriers,
- Teleconsultations
- Telehealth
- Healthcare
- Implementation
- Use
- Adoption
- Online Consultation
- Evaulation

ABBREVIATIONS

IT	Information Technology
ICT	Information, Communication and Technology
ISRO	Indian Space Research Organization
MCI	Medical Council of India
SOPs	Standard Operating procedures
ROI	Return On Investment
WHO	World Health Organization
mHealth	Mobile Health
telecomm	Telecommunication
HCFs	Healthcare Facilities
TOE	Technology-Organization-Environment
CPG	Clinical Practice Guidelines

Chapter- 1

Introduction

Introduction

The subject of utilizing telemedicine to address world medical problems warrants study, as does the distinguishing proof of boundaries to reception and potential systems to defeat those hindrances(31). Telemedicine expands admittance to general and concentrated medical care administrations, conveys care to rustic regions, offers suppliers more prominent adaptability in booking, and sets aside patients' time and cash in looking for care (1).

Telemedicine isn't new. It has been worked on utilizing electronic correspondence for quite a long time, and utilizing customary types of correspondence for any longer(40).

Regardless of this authentic foundation, telemedicine seems to have a polarizing impact on the medical services calling. Individuals are once in a while unbiased about it; they are either eager defenders or fervent rivals(6). The advocates accept that telemedicine addresses what's to come. It will prompt better expectations of clinical consideration just as diminished expenses. The rivals accept that it addresses a danger to the conventional specialist patient relationship and is a characteristically hazardous approach to rehearse medication(8,9).

The potential lawful and moral issues related with telemedicine are frequently waved as a 'cover' to help the view that the potential confusions of telemedicine imply that it couldn't be utilized to shape the premise of a clinical assistance(2).

With its utilization of ICT, telemedicine addresses an engaging angle in the computerized change in medical care(2,9,19). Telemedicine utilizes ICT to convey medical services administrations as well as clinical instruction over distance. It considers getting care particularly for people in therapeutically underserved regions.

The achievement of telemedicine drives is affected by various components identified with the actual drive itself and the surroundings where it should be executed, which can obstructs the advancement as hindrances if not thought about adequately(5).

"Hindrance" consequently is characterized as "a condition or impediment that keeps individuals separated or forestalls progress"(11).

Until far, a slew of research have addressed telemedicine roadblocks in a variety of methodological settings, or center around segregated clinical settings just as uncommon geographic regions(13). In any case, the vast majority of these investigations make various determinations, prompting a heterogeneous field of exploration, and, as far as we could possibly know, no synopsis of key logical commitments exists that unites earlier work(12,14).

Besides, the association between boundaries identified with individuals, cycles and items engaged with telemedicine execution stays obscure (17) . To address existing hindrances and conquer them effectively, information about the actual boundaries and conceivable help systems for tending to them is exceptionally significant (16).

Expanding populace of developing countries has sparked increased demand in medical treatment. Request of reasonable and quality medical care is expanding step by step. Fast interest at the worldwide level for medical services the board is expanding in the course of recent many years, expanding accentuation on medical services quality (25).

Evaluating the medical services and a major challenge has been enhancing the quality of care in most non developed nations (4, 22). Ordinarily, nature of general medical services has been disregarded and consideration is simply given to specialized angles than the relational segment. The expense of medical care has consistently been a significant issue (19).

Cash based consumption on medical care has expanded numerous folds. Disastrous wellbeing consumption is representing a danger toward a family's monetary capacity to keep up its fundamental requirements (23).

There are several obstructions to getting to medical care such as topographical access, accessibility, moderateness, and agreeability(21, 22). These obstructions become more dangerous to ladies, youngsters, old, and actually incapacitated populace. Despite the fact that the wellbeing administration arrangement and the topographical access have improved, nearby ladies may not utilize the administrations except if the offered types of assistance fulfill their needs in quality and social habits (31, 32, 33).

To overcome these obstacles, the medical industry is now adopting telemedicine solutions to expand the scope of its services available to the general public. The incredible improvements in ICT, especially, the online advances have opened up additional opportunities in giving better medical care to populace (44,45). Telemedicine is step by step coming up as a practical approach choice for the legislatures in non-industrial nations (34).

Telemedicine is the use of electronic communications and data developments to provide healthcare aid. (34,36). Telehealth is a term that refers to a more substantial use of technology in areas such as education, health promotion, preventive services, customer outreach, and other applications where electronic exchanges and data improvements are used to assist medical care administrations.. As indicated by World Health Organization , "Telehealth includes the utilization of broadcast communications and virtual innovation to convey medical services outside of conventional medical services offices" (25)

In a more extensive and broad way, WHO characterizes telehealth as: "The conveyance of medical care administrations, where distance is a basic factor, by all medical care experts utilizing data and correspondence innovations for the trading of legitimate data for finding, therapy, and avoidance of sickness and wounds, examination and assessment, and for the proceeding with

instruction of medical services suppliers, all in light of a legitimate concern for propelling the soundness of people and their networks" (38) .

Telemedicine is limited to utilization of Information Technology for therapy aw well as clinical consideration while telehealth covers more extensive region, Information Technology is utilized to empower surroundings. Albeit, these terms convey an alternate importance inside and out however in non-industrial nations, both these terms are utilized reciprocally (40,41).

mHealth helps in tolerant training, wellbeing advancement, sickness self-administration, decline in medical services expenses, and distant checking of patients and can improve medical care conveyance(46)

Loads of endeavors have been made by government (strategy creators, specialists, as well as overseers) to build a telemedicine network that spans their geological boundaries, however speed of advancement is moderate and acknowledgment of innovation to populace isn't getting. Tragically, the innovation that has been created to eliminate or limit the hindrances to the medical care looking for at present faces loads of boundaries itself and its improvement has not been occurring as it was normal by strategy producers and specialists (1, 4).

It was normal that telemedicine will lessen the weight of clinics, enduring of patients, cash based use, need of transport, emergency clinic dread, and set aside the time and cash of overall population (4, 10).

It was also envisaged that it would improve the quality of service and develop patient trust in the telehealthcare framework. (40).

We can't refute telemedicine's incremental progress, and there are some examples of overcoming adversity in numerous pieces of the world however the influence, which we have anticipated from telemedicine is as yet deficient.

At that point question emerges where is the issue? Why telemedicine isn't picking the speed and why it isn't getting famous among specialist co-ops also among the patients (6, 7)

Numerous telemedicine experimental runs programs have been dispatched in most recent thirty years. (9). The achievement for the most part occurred in the created nations however in the vast majority of the agricultural nations, accomplishment of telemedicine project's restricted.

There are numerous boundaries in the reception of telemedicine and selection disappointment is a big concern, which should be examined and investigated. As per an examination. Until we can't discover, enroll, break down, and comprehend the boundaries in the sending and advancement of telemedicine, we can't guarantee accomplishment of telemedicine program (44). Significant impediments such as those listed below are currently at work in the field of telemedicine implementation and activity-based telemedicine.

- Individual Related Hindrances
- Measure Related Hindrances
- Object Related Hindrances.

Despite the fact that research broadly available on telemedicine obstructions , a precise outline to sum up key logical commitments is absent (39). This paper plans to assess the deficiency with a deliberate survey of previously existing assessment. Major obstructions for telemedicine execution were found and sorted relying upon the elements setting off the boundaries. These elements incorporate patient, medical care supplier, culture and illness (individuals related); wellbeing area, principles/rules, legitimate system, funds, organization and technique (measure related); also, technology (object-related). Suggestions are also given to remove the hindrances(43, 44).

Chapter 2 -Aims and Objectives

Aim

To determine the barriers which are causing hindrances to adopt Telemedicine in developing countries.

OBJECTIVES

-To examine the various major challenges faced in implementing telemedicine in developing countries.

-To identify the solutions to remove the hindrances.

-To identify if there is any relationship among the barriers identified.

Chapter 3

LITERATURE REVIEW

A large number have dread of negligence related Legal issues prevent them from effectively participating in and developing telemedicine programmes. (8, 9). Misbehavior risk is a significant obstruction in the act of telemedicine administrations (6, 19).

Affirmation and certification obstructions additionally dis-encourage specialists. There is no open strategy End-users can benefit from telemedicine since it ensures the safety, privacy, and confidentiality of patient data during teleconsultations. (30).

There are powerless administrative structures identified with repayment in government just as in private areas against the teleconsultation administrations (20, 21).

There is absence of consistency in telemedicine guidelines across the world. Without clear administrative arrangement and rules, doctor has misgiving and dread to rehearse telemedicine (26, 40).

. These gatherings don't consider telemedicine as another order or another part of medication (3).

Controllers consider that Online Consultations presents difficulties as well as accept that it is new and doubtful. There is no lucidity what to be directed. Empowering administrative climate’s needed so as to guarantee suitableas wellas satisfactory conveyance of medical care administrations (41).

Once telemedicine framework is sent and is set, at that point the telemedicine programme will require undertaking champions to carry it out. Doctors, Information Technology champions, and patients are the three major bosses. (5).

Accomplishment of any telemedicine program relies upon these heroes yet doctors are not many in agricultural nations, so a large portion of the sent telemedicine program bite the dust not long after their steering (9).

There are additionally inadequacies in the preparation and occupation direction of these physicians (1).

In agricultural countries, there is a scarcity of motivated, focused, and visionary telemedicine pioneers. These forerunners are telemedicine's brand ambassadors, carrying the telemedicine banner high even in the face of adversity. Whatever telemedicine work we discover in these developing countries is due to the individual efforts of these telemedicine champions. (17).

Worry and dread toward telemedicine must be taken out through giving the information about telemedicine (22).

Telemedicine is a hybrid framework that encompasses both clinical and Information, Communication and Technology components for a thorough understanding of telemedicine arrangements and delivery. (18, 20).

There’s genuine absence of specialized people, To smooth functioning of telemedicine framework, prepared specialized labor is required (16, 29)

There is absence of specialized heroes in the field of telemedicine in agricultural nations, particularly in the field of medical care and just deliberate bosses to a great extent are noticeable (28).

It is reality that numerous doctors and customers can't fix the specialized issues emerging from PC framework and ICT organization. Thus, for an appropriate and smooth working of telemedicine framework, we need

prepared and master labor to build up a steady and constant correspondence during teleconsultation (44).

Lamentably, there is a huge absence of such prepared people in the framework in the greater part of the non-industrial nations. There are not very many foundations in agricultural nations, which prepare and foster this extraordinary gathering of specialists. It is exceptionally hard to track down an individual who has gone through preparing in Medicine and in Information Technology (47).

Because of fast headway of telemedicine innovation, many best in class offices and gear (programming and equipment) become old and obsolete. A composite and cumbersome specialized framework may yield frustrating assessments until it turns out to be more universal and easy to use. (39, 40)

Individuals who work with old ideas get demotivated and dissatisfied, and they lose enthusiasm in providing services types of assistance through old innovation framework. Government likewise thinks that its hard to supplant, which is effectively because of bunches of budgetary necessity for more current innovation (22, 34).

A large portion of the telemedicine applications require a rapid Internet data transfer capacity to run as planned. Tele-medical procedure, ongoing tele-ophthalmology, continuous tele-radiology, and urgent needed consults are a few instances of such applications (21, 31).

Problematic and Low-bandwidth Internet is a barrier to the smooth delivery of telemedicine administration. (7).

For constant teleconsultations among suppliers and customers, there is a requirement for dependable and rapid Internet accessibility (4). Web inclusion is still bottleneck in many agricultural nations, particularly in provincial and far off regions.

Most rustic regions don't have the monetary cash-flow to autonomously put resources into a broadband organization that would give high velocity Internet to their occupants. Media communications ("telecom") organizations are the essential suppliers of rapid Internet, however they do not put much money in provincial regions in light of the fact that such speculations are not as beneficial (9).

Questions have been voiced up over different issues like whether a proper patient-supplier relationship has been set up, absence of a satisfactory actual assessment of the patient, precision of the patient's set of experiences given oneself detailing of the patient over a telehealth association, and not gathering state clinical board authorizing prerequisites. There is no legitimate structure to secure specialists just as customers for online solution (12, 15).

The vast majority of the specialists fear Consumer Protection Act because of negligence related issues. There is an absence of SOPs/rules for the telemedicine practice. Legitimate issues encompassing patient protection, wellbeing, security, and classification additionally assume imperative part in teleconsultation (19, 21).

Almost no data exists on the degree of misbehavior responsibility and telehealth. Clinical negligence related lawful issues ought to be distinguished and tended to for smooth act of telemedicine (29).

Exceptionally complex, protected, secure, and fast teleconsultations have decreased the distance boundary in medical care chasing and have improved the medical services access. To stay away from misbehavior in telemedicine, medical services experts ought to be explicitly prepared for telemedicine as they accomplish for their regular OPD Consultations (4).

Helpless accessibility of specialists and well trained doctors raises legitimate ramifications and warrants permitting of telemedicine providers. The duty of

authorizing to telemedicine suppliers falls under the domain of the state authorizing gatherings or sheets of a specific country. These approaches overseeing telemedicine and doctor licensure shift broadly the over the nation (19, 30).

Informed Consent before teleconsultation - Need for an earlier composed or verbal educated assent for any telemedicine conference and treatment distorts telemedicine as an alternate type of administration, as opposed to as a valuable service that improves screening and treatment administrations (14).

Medical services suppliers need to have an unmistakable comprehension of what their lawful and moral obligations are. Also, patients should get the security of sufficient guidelines of care and realize that the individual to whom they are entrusting their wellbeing has the appropriate education and training (18).

The absence of obvious legitimate framework, rules, and principles obstructs the telemedicine to improve medical care access and medical care quality through ICT (10).

Disappointment will undoubtedly occur if suppliers and clients are not considered while fostering the telemedicine stage. For instance, in Madhya Pradesh, India, ISRO and high level heads at ministry level chose to carry out telemedicine arrangements across the state however it flopped seriously as there were no doctors at ground level. Doctors were not given sufficient training for the new technology and people as a client didn't know about the advantage of the stage (7).

Notwithstanding, despite mounting evidence of the benefits of telemedicine, there are still several roadblocks and challenges to its appropriation. Its appropriation is regularly called as a failed project in light of the fact that 75% of them are deserted or 'flopped by' and this rate increments to 90% in agricultural nations (14). The writing has explained that there is neither one-

size-fit-all structure nor best-practice answer for all ICT advancements or for all nations. The obstacles and difficulties encountered in receiving and implementing one ICT advancement in a given country/association may not be comparable to those encountered in receiving and implementing a similar ICT advancement in another country/association or in a similar nation/association. (14, 16, 18).

In order to receive a specific Information, Communication and Technology development, most countries/associations will most likely face some common barriers and challenges. (e.g., telemedicine) with a huge level of variety (20).

Notwithstanding, every country/association will have its own extraordinary arrangements of boundaries and difficulties identified with its unique circumstance and surroundings (e.g., full scale monetary, culture, construction, social and political circumstance, likely clients (e.g., acknowledgment, disposition), methodology and plan (e.g., norms, cycles), and ICT advancement needs (e.g., hardware, foundation, speed, ease of use (2, 4).

A portion of the obstructions and difficulties that may restrict one ICT advancement in a particular nation/association may presently don't exist, may halfway decrease, or may turn into a chance for another ICT development, or nations/associations. Subsequently, a definitive accomplishment of receiving and carrying out telemedicine in a given country or association is guaranteed if these hindrances and difficulties are enough tended to (9, 11).

An obstruction recognized in the literature and furthermore this investigation is that a few specialists have an inclination for the previous approach i.e. in person consultations .This is normally ascribed to more aged General Practioners.It is shown in an investigation that while a few group have an inclination for the conventional methodology which can be related with life experience, others 'simply don't have any desire to become familiar with the innovation and might not have the learning style fit to telemedicine', yet others discover these to be troublesome abilities to dominate(44, 46).

One study showed that a few specialists 'need trust in the capacity of telemedicine to convey a skillful assistance' and hence lean toward the customary methodology. Like this, another member said that 'some [doctors] are less agreeable and certain of making a sensible analysis around there' (34, 35).

A statement from one study caught a critical obstruction that is reliable with an inclination for the customary methodology: 'it is simpler to finish a Patient Transit Scheme application than to arrange a video-meeting' (37).

Telemedicine isn't new. It has been worked on utilizing electronic correspondence for quite a long time, and utilizing customary types of correspondence for any longer. Notwithstanding this recorded foundation, telemedicine seems to have a polarizing impact on the medical services calling. Individuals are infrequently nonpartisan about it; they are either energetic advocates or fervent adversaries (36, 37, 38). The advocates accept that telemedicine addresses what's to come. It will prompt better expectations of clinical consideration just as diminished expenses. The rivals accept that it addresses a danger to the conventional specialist patient relationship and is an inherently dangerous approach to rehearse medication. The potential lawful and moral issues related with telemedicine are frequently waved as a 'cover' to help the view that the potential entanglements of telemedicine imply that it couldn't be utilized to frame the premise of a clinical assistance (1, 9).

Absence of repayment is a critical obstruction to utilization of telehealth administrations. For example, each state has its own set of rules and regulations regarding the types of administrations that can be reimbursed by Medicaid. According to the National Telehealth Policy Resource Center, only 9 states reimbursed the three main telehealth modes in 2018: live video, store-and-forward, and remote understanding observation. (36, 37).

Moreover, Medicare rigorously manages the kinds of suppliers who are repaid for giving telehealth administrations. Be that as it may, numerous states don't

repay locally established telehealth administrations, or just repay administration gave through home wellbeing offices, making obstructions to utilizing telehealth to arrive at patients at home (16, 18).

Notwithstanding restricted repayment arrangements, country programs have additionally depicted an absence of lucidity about existing guidelines. For instance, one report portrays diminished supplier interest in nonconcurrent telehealth because of an absence of clearness about the repayment strategies (19).

Chapter-4

METHODOLOGY

❖ A systematic literature search was performed on following databases:

- Medline
- Science Direct
- NCBI
- PubMed Central
- Scopus

❖ This search included 15 articles which were written in English language and published within last fifteen years (2005-2020).

❖ Some other sources were also searched for the study purpose are:

- Research Gate
- JAMA Network
- Google Scholar
- Lancet journal
- Material referenced other in the publications

- **Inclusion criteria:**

To provide a structured review eligible studies included on the basis of following parameters:

- Articles published within last fifteen years(2005-2020)
- Articles published in English language
- Retrospective studies
- Purpose of the study is to determine the Barriers in adopting Telemedicine in developing countries.
- Articles in which there's Solutions, Suggestions, Recommendations or Advices are given to reduce the barriers of adopting Telemedicine.

- **Exclusion criteria:**

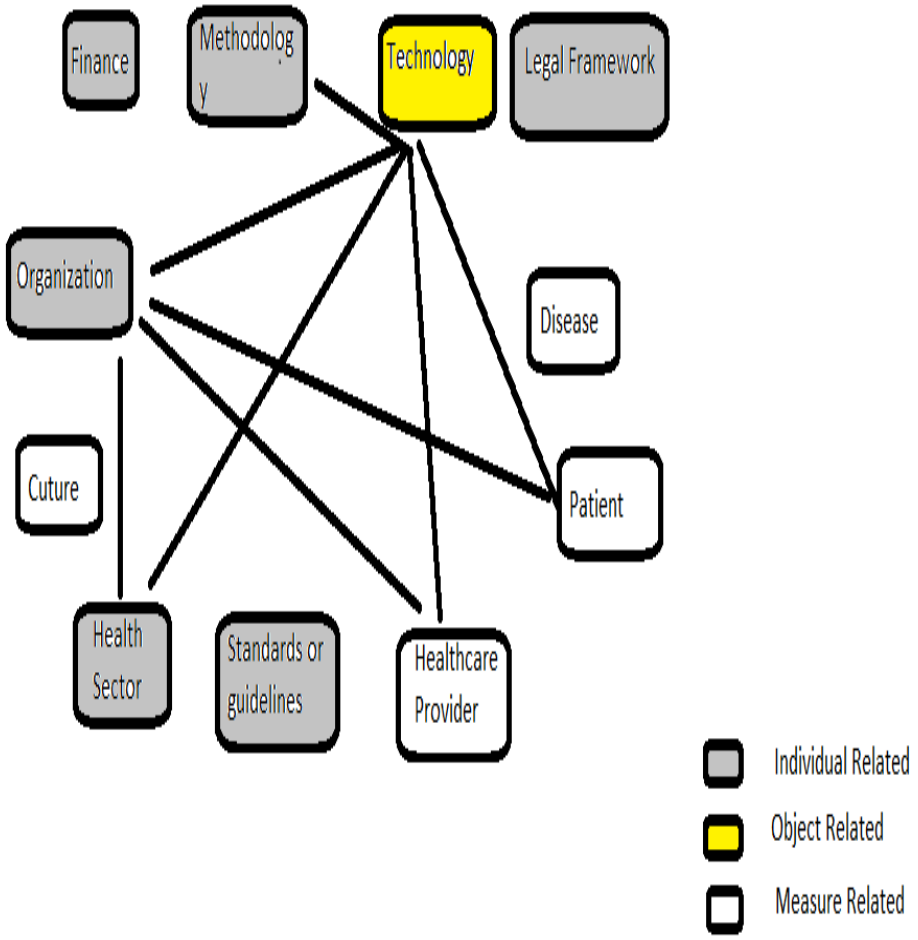
Studies excluded from this literature review on the basis of following parameters:

- Articles published before 2005.
- Studies talking about barriers to adopt telemedicine worldwide
- Studies talking about barriers to adopt telemedicine in developed countries
- Studies who doesn't say anything about the solutions to reduce the barriers
- Studies which did not clearly describe their results
- Editorial articles and review articles

- Total 45 studies were identified in this literature search and after applying the series of inclusion and exclusion criteria only 15 articles were found to be included in this review.

Chapter-5

FINDINGS


Finance
Methodology
Technology
Legal Framework
Organization
Disease
Cuture
Patient
Health Sector
Standards or guidelines
Healthcare Provider
Individual Related
Object Related
Measure Related

All classifications were alloted to the three overall subjects "individuals", "Object" and "Measure". The subsequent classes are: patient, medical care supplier, culture and sickness (individuals related); wellbeing area, norms/rules, lawful structure, funds, association and approach (measure related); and Technology (object-related) A few boundaries are identified with more than one class as they are set off by different elements. The interdependencies between the elements (where obstructions are identified with higher than 1 factor) are appeared lines interfacing the elements (4).

Particularly the interfacing lines between organization, teachnology and health area, just as the association among patient and medical care supplier, are verification that the elements are exceptionally interrelated. Since certain snags are brought about by people, their associations, and the actual innovation, the investigation shows that neither of these two gatherings of hindrances can be seen freely (19). Furthermore, patients and 4,444 medical services suppliers face similar issues as they are both potential client gatherings. In addition to other things, these client gatherings are likewise influenced by specialized and hierarchical issues: hierarchical requirements, like a work lack or restricted specialized help, can hamper the acknowledgment/appropriation of individuals and accordingly hamper the accomplishment of telemedicine programs (16).

Variables identified with lawful structure or culture, every one of these elements may not help the execution of more elevated level telemedicine, and there are no snags for different classifications, so they are not interrelated. This doesn't imply that they won't contrarily affect client acknowledgment or authoritative status (1, 7). For instance, if specialized doubt is important for the applicable culture of a rustic local area, individual acknowledgment will likewise be ruined. Moreover, absence of monetary help has become a central issue in the execution of telemedicine in provincial networks (10).

There are numerous hindrances in the acquisition of telemedicine and acquisition failure is a significant issue, which should be talked about and investigated. Following vital hindrances are as of now working in the field of telemedicine implantation and activity (3).

Individual Related

Finance

Despite the fact that telemedicine can be utilized to expand admittance to mind and diminish the expense of care yet that is for the most part valid for the client's perspective. Story is unique on the off chance that we look from the side of suppliers or medical care associations (21).

For building up a telemedicine unit, it needs heaps of monetary speculation. It turns out to be more hard for the non-industrial nations to assign colossal spending plan for the interest in telemedicine. Setting up and operating a "Telemedicine Unit" necessitates purchasing the equipment required to set up the framework at both the supplier and customer's end (in the clinic, centre, or drug store); maintaining the hardware; training the doctors and nearby medical care workers on the innovation; and compensating the doctors(29).

There are a variety of expenditures associated with providing teleconsultation, such as Internet and power installation, pay for care employees, and other recurring costs, to name a few.. Cost brought about in buy, establishment, and support of telemedicine administrations (telemedicine and correspondence gear) are high and don't give legitimate profit from speculation (ROI), so there is less monetary advantages to the experts, which prompts the liquidation and conclusion of numerous wellbeing offices in country networks and furthermore

forestalls further telemedicine extension to networks requiring specific administrations (27).

Legal Framework

Telemedicine rehearses has killed numerous physical and emotional boundaries to medical services chasing however have raised numerous lawful and moral issues, which are typically not experienced during conventional medical care conveyance (25).

Lawful contemplations are a significant deterrent to telemedicine uptake. There is no legitimate system of e-remedy, advanced solution, or versatile based SMS remedy. Advanced remedies are not endorsed and acknowledged by MCI or some other administrative power. Internet endorsing arrangements shift across the nations and across the states inside nations (26, 28)

Standards/Guidelines

There is an absence of explicit standard working techniques (SOPs)/rules for the telemedicine practice (34). Lawful issues encompassing patient protection, wellbeing, security, and classification additionally assume indispensable part in teleconsultation. Next to no data exists on the degree of negligence responsibility and telehealth. Clinical misbehavior related lawful issues ought to be recognized and tended to for smooth act of telemedicine (45).

Organization

The lack of a proper organisation structure to deliver telemedicine services is the most significant impediment to the advancement of telemedicine services in any country. It requires a coordinated effort with all potential partners at each level of the medical care conveyance architecture because it is a half-and-half order (30, 40).

In the growth of telemedicine, a lack of cooperation between partners without a clear method creates a bottleneck (47).

Health Sector

Absence of healthcare provider: doctors - A large portion of specialists don't know about the most recent data innovation and discover trouble to utilized current IT contraptions. There is absence of telemedicine specialists in medical services areas (38).

Nursing staff: lack of para clinical champions - Telemedicine health administrations are also assisted or provided by nursing staff, but their involvement in telemedicine isn't recognised. If they are properly prepared and directed, nursing professionals can play an important role in the growth of telemedicine.. (1).

Methodology

Methodological barriers include

- missing clinical assessment,
- evidence of cost-viability and
- absence of unwavering quality

<u>Measure Related</u>

Culture and Disease

Social and culture milieu of the local area and society of a specific nation likewise makes loads of obstructions in adjusting, using, and supporting telemedicine administrations.

The absence of ICT proficiency, mindfulness, language boundaries, and cultural deficiences between the specialist organizations and patients and so forth are additionally main considerations, which forestall further turn of events and extension of telemedicine network in non-industrial nations. In addition, social

and illness related issues impact all individuals included, as socially improper correspondence or then again unique requests for bunch treatment (40).

Health care provider and Patient

Resistance to change

An absence of help to more current ICT instruments hosts been seen from the two gatherings (suppliers and clients). A few investigations have uncovered that the protection from change has been accounted for toward telemedicine from suppliers (doctors) just as from clients (customers/patients) for fresher innovation (1, 44).

ICT education

In agricultural nations where general education isn't even satisfactory, we can envision the mindfulness level of populace toward ITC proficiency. Helpless mindfulness toward present day advancements and their utilization in conveying medical services is by all accounts a major boundary in non-industrial nations (8).

Individuals in non-industrial nations are very little mindful about the advantages offered by telemedicine. Indeed, even doctors are shy of IT information and not refreshed. Helpless mindfulness level makes fears and obstruction toward ICT innovation and make obstacle in the reception and improvement of telemedicine (7). Age likewise assumes a significant part. Numerous more seasoned doctors don't feel great managing ICT innovation. A few patients, especially more seasoned patients, are reluctant about the new innovation.

Numerous medical services experts are not open to working with PCs and present day contraptions and consider innovation additional work for them (36). They additionally dread that telemedicine may prompt occupation misfortune or a decrease in their bedside presence.

Object Related

Technological boundaries

Innovation itself is turning into a boundary in the advancement of telemedicine in developing nations. Because of the Significant expense of changing the previous technology, most stakeholder can't afford it(4).

Many developing nations have Inadequate access to Information and Communication Technology (ICT) such as PCs, Internet connectivity, printers, and power for the proper execution and operation of telemedicine programmes (9).

Web access and electrical supply are different issues identified with non-success of telemedicine network in country and far off areas [4,5]. One of the significant obstacles to viable conveyance of telemedicine solutions for country and far off areas in agricultural nations is deficient and lacking ICT framework (5).

Solutions to Remove the Hindrances

Individuals related obstructions:

The requirements and assumptions for the end client, be it patients or medical care suppliers, ought to be considered inside the arranging interaction of each telemedicine development. In this setting, thinking about the person as a feature of a bigger cultural design, for example the meso-layer of the execution measure, is pivotal (16).

Thusly, when arranging telemedicine intercessions, family members of the patients just as the expert organization of medical care experts have to be important for the client focused plan measure. A survey by proposes a need of such measures (22).

However, as the immediate social climate can fill in as mechanical help while battling with the utilization of the application , this is particularly significant (34).

Aside from that, being some portion of a local area is of imperative significance for individuals living in a rustic region. Telemedicine arrangements permitting for social help on account of sickness can help satisfying this need . Subsequently, acknowledgment research likewise needs to put focus on local area and social impacts (19).

Measure/Process related obstructions:

Paying admiration to existing provincial constructions and individuals associated with them is a critical angle in defeating hindrances to telemedicine execution and demonstrates that neither individuals nor cycles can be seen independently (16, 17).

Particularly for medical services suppliers, a consistent reconciliation of telemedicine innovations into their work measures is significant. Rules for analysis and treatment accordingly need to join telemedicine measures (13).

Since proof on the appropriateness of advanced mediations, particularly for the therapy of ongoing infections, is still scant (20).

Verbally process strategies and normalized appraisal devices for ease of use ought to consequently be utilized as a feature of the configuration measure. Preparing to improve eHealth education for both medical services suppliers and patients could likewise be a fundamental and accommodating advance in effectively tending to a portion of the boundaries. Inside associations just as entire districts, an organized execution plan for telemedicine is basic (20).

Governments need to give an administrative arrangement of laws and guidelines which considers financing, repayment of use of telemedicine and responsibility in instance of misbehavior. Particularly financing plans are of high significance in provincial regions. Another part of a locale focused execution methodology is a reasonable correspondence of telemedicine advantages to all partners (14).

Object related boundaries:

The telemedicine innovation being referred to moreover must be created by considering individuals included and existing cycles. It must be fitting for the local and nearby foundation and satisfactory by patients and medical care suppliers (31).

Can an all-encompassing telemedicine approach for rural and underserved areas be successful at that time? We hope that by adopting the suggestions provided – which are independent of any particular country or societal structure – the obstacles identified can be effectively overcome, resulting in a more effective telemedicine campaign. (39)

Chapter-6

DISCUSSION

Telemedicine has impacted practically all parts of medical care and numerous examples of overcoming adversity have detailed telemedicine's role in improving medical care accessibility, lowering costs, and improving the quality of care (44).

Telemedicine could be a significant apparatus in accomplishing medical services coordination and decreasing medical services incongruities. In spite of such a lot of advancement, it still can't seem to become vital piece of medical services framework (17, 18).

Accomplishment of telemedicine possibly depends when it becomes basic piece of medical services conveyance framework and not as an independent venture (1, 9).

Moreover, as the boundaries are profoundly interrelated, a holistic way in defeating the hindrances is fundamental. Particularly the patient must be studied to his/her immediate and roundabout circle of people, with a unique spotlight on his/her individual innovation evaluation (8).

As recently depicted, particularly the singular attributes and abilities of patients and medical services suppliers, cycles of preparation and subsidizing just as an adequate local framework are (quantitatively) the main boundary classes recognized (7, 17).

Just if boundaries are found in mix with others, an improvement of the execution interaction is a reasonable objective (1).

Chapter-7

Conclusion

There is colossal tension on governments to give more reachable and quality medical care to its public. Only option and creative strategies like telemedicine can assist with satisfying this deficiency. These different hindrances referenced above are hindering the speed of extension of telemedicine. These different hindrances referenced above are hindering the speed of extension of telemedicine. It is currently an ideal opportunity to limit the previously mentioned boundaries and the constraints for the seamless development of a global telemedicine network for the growth of humanity.

Chapter- 8

Recommendations

- Positive tactics and procedures at the state and national levels are required for the smooth operation and improvement of any framework. These defined norms, principles, procedures, and conventions are critical for a telemedicine system to perform smoothly and securely, ensuring that the public receives high-quality medical care. Many non-industrial countries are struggling to keep up with the rest of the world, There is no clear and standardised telemedicine strategy, resulting in chaos when it comes to developing telemedicine-related administrations, programmes, and smooth execution.

- Normalization of both equipment and code, as well as training rules, would aid programme managers in overcoming difficulties of interoperability, compactness, and security.

- A public-level coordinated effort between the Division of Health and Family Welfare and the Department of Information Technology should be made to promote a public telemedicine network. Although there are examples of such a concerted effort and the presence of a telemedicine division in just a few non-industrial countries, such as India, it is shaky, broken, and unfounded

- A lack of organised association is another impediment to transforming telemedicine-related vision and political will into focal-level methods. In the absence of such an agreement, outlining a programme to attain those political wills becomes impossible. It's difficult to execute and evaluate projects that aren't explicitly time-bound and result-oriented. Precise arranging of execution of such telemedicine programs, its simultaneous checking, and last assessment requests heaps of prepared HR.

- Preparing is an import part of ability advancement and the associations ought to foster a preparation timetable to prepare wellbeing experts for smooth conveyance of telemedicine administrations. It is vital to give preparing to all administration

officials routinely. Without legitimate information on IT of government officials, e-administration venture won't ever see the genuine substance of the undertaking.

- There is a need to incorporate not many sections identified with telemedicine in Medical training educational program to sharpen and situate growing specialists to get familiar with the specialized piece of this control.

- In the Ministry of Medical Education, as in the Ministry of Health Care, a separate telemedicine instruction secretariat and directorate should be established to advance the advancement of telemedicine..

- Worry and dread toward telemedicine must be taken out through giving the information about telemedicine.

- we need prepared and master labor to build up a steady and persistent correspondence during teleconsultation.

- Licencing of Telemedicine- Authorizing guarantees that doctors meet scholarly and clinical ability norms for the telemedicine practice. It shields public from unfit and inadequate doctors and medical care scholarly. Authorizing additionally assists with upholding proceeding with principles.

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