DIGITALIZATION OF HOME HEALTH CARE AMID COVID-19 IN INDIA: A REVIEW

Dissertation Submitted to

The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

By

Rituparna Das

Under the Supervision and Guidance of

Dr. Seema Mehta

2021

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TO WHOMSOEVER IT CONCERNS

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **Digitalization of home health care amid Covid-19 in India: A Review** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Rituparna Das
2.07.2021

CERTIFICATE

HEALTHARK

Date: 14th June, 2021

Whom So Ever It May Concern

This is to certify that **Ms. Rituparna Das** worked with Healthark Insights Wellness Solutions LLP as an Intern Consultant from 25th March 2020 to 25th June 2020. During her internship she conducted market assessment involving secondary research and basic excel modelling across Latin American, Russian and Saudi Arabian markets. She supported her seniors in preparing client deliverables in form of PowerPoint presentation and excel formats.

She has always shown responsible attitude towards the tasks assigned to her and completed them within time with utmost sincerity. She has been a good team player and was supportive to her other colleagues in the organization.

We wish her a bright future and success in her future endeavours.

Purav Gandhi

Sincerely,
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Founder & CEO
Healthark Insights

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CERTIFICATE

This is to certify that dissertation title **Digitalization of home healthcare amid Covid-19 in India: A Review** is a record of the research work undertaken by Rituparna Das in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

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ABBREVIATIONS

COVID-19	“Coronavirus Disease”
NCDs	“Non-Communicable Disease”
EMR	“Electronic Medical Record”
UHC	“Universal Health Coverage”
CKD	“Chronic Kidney Disease”
ICMR	“Indian Council of Medical Research”
OOP	“Out of Pocket Expenditure”
OECD	“The Organization for Economic Co-operation and Development”
COPD	“Chronic Obstructive Pulmonary Disease”
AI	“Artificial Intelligence”
m-Health	“Mobile Health”
CVDs	“Cardiovascular Disease”
IoMT	“Internet of Medical Things”
ECG	“Electrocardiography”
PMJAY	“Pradhan Mantri Jan Arogya Yojana”
VR	“Virtual Reality”
WHO	“World Health Organization”
NGOs	“Non-Governmental Organization”

ATNF	“Apollo Telehealth Network Foundation”
EY	“Ernst & Young’s”
PwC	“PricewaterhouseCoopers”
ICT	“Information and Communications Technology”
CTI	“Computer-Telephone Integrated”

Digitalization of home health care amid COVID-19 in India: A Review

1. 1 Health sector in India:

Healthcare sector in India has been evolving at a very high pace since the past decade. The healthcare industry has been shifting from the profit earning landscape to delivery of an accessible & affordable healthcare. Home healthcare has brought a significant change in the delivery of 3A's by the means of providing needs of the patient, including home medical care to non-medical assistance. "Home care may also be referred to as domiciliary care, social care or in home care. Care may be provided by licensed healthcare professionals who provide medical treatment needs or by professional givers who provide daily assistance to ensure the activities of daily living."

1.2 Home Healthcare:

It is the need of the hour considering the current burden of COVID-19, rising NCDs, unhealthy dietary food, and a greater number of people in the geriatric population.[1]

According to a review[5], home healthcare is growing at an enormous rate in the healthcare industry, with an expected growth of "66 percent" over the next 10 years with over "7 million" patients served each year. Homecare is designed on a method dependent solely on collaboration & communication.

With the modernization, patients have shown an increased inclination towards their health. The healthcare industry has always been focussed to enhance the patient preference & experience. Mostly, Home health care is comparatively less expensive, more favourable and it is as adequate as care received in a clinical setting.

`Medical', 'psychological', and 'social assessments', 'wound care', 'medication education', 'pain management', 'illness information and management', 'physical therapy', 'speech therapy', 'medication reminders', and 'empowerment for health

promotion and prevention' are all included in the home health services. Home care could also be proven beneficial for patients requiring post- hospitalization care.

As a model of acute care delivery, home health will gain traction. With future investment in new, less intrusive technologies that lessen the need for health management in hospitals, more sophisticated home health models will emerge, expanding the variety of illnesses that may be diagnosed and treated at home.

Table 1.1 Home Health care companies, total funding and the services provided

Company	Founding year	Total Funding ($ million)	Services provided
Practo	2008	228.2	"Appointment bookings, check-ups, online consultations, nursing care"
Mfine	2017	48.8	"AI-powered telemedicine mobile app"
Portea Medical	2013	76.1	"Home health care: critical care, diabetic care, new born baby and mother care, physiotherapy, lab tests, nursing care"
Lybrate	2013	14.4	"Online and mobile-based platform that connects patients and doctors"
PharmEasy	2015	671.5	"Teleconsultation, medicine deliveries, and diagnostic test sample collection"

1mg	2015	204.6	"Online consultation, diagnostic tests, pharmacy, medical devices"
Medlife	2014	56.5	"Online medicines order & home-delivery of medicines"

Source: Crunchbase

1.3 COVID-19:

COVID-19 has devastated lives and altered patients' attitudes toward healthcare. During the COVID-19 outbreak, health systems worked hard to adopt virtualized treatment methods, which eliminated the need for physical interaction between patients and healthcare providers.

The COVID-19 pandemic has offered India with both obstacles and chances for growth. Many Indian start-ups have risen to the situation and hastened the creation of low-cost, scalable, and rapid solutions as a result of the crisis. Furthermore, the pandemic is fuelling the growth of telemedicine and the home healthcare business in India.

A specific segment of home health care; telehealth has facilitated care from a distance through its technology enabled health systems. It has significantly contributed in enhancing the healthcare delivery during COVID-19. Telehealth has personified/served mild to moderate symptoms of COVID-19 in an effective manner, while sitting back at home, although an initial form of care. According to current literature[6], Telemedicine also has a significant role in screening for COVID-19 symptoms and delivering routine needs and follow-up care.

A reduced-on site referrals indicated fear of COVID-19 infection among themselves in typical clinical settings. Also, there was a dire need observed to continuously monitor the moderate severe patients of COVID-19. There has also been a perception that, non-severe COVID-19 patients should be monitored on a regular basis, either at quarantine centres or at home. As a result of the increased demand, consumers are looking for new ways to remotely monitor their health.

1.4 Digital Technologies:

Digital technologies like cloud-based computing, AI, big data, IoT, chatbots, Virtual reality have proven to be effectively tackling the social problems. "During COVID-19, digital technologies have been extremely helpful in contract tracing, treatment of COVID-19, tele remote education, supply chains."[9]

While the use of technology to reach out to healthcare consumers through various telehealth platforms has been around for a long time. In developing countries like India, the growth of these services has been very slow and is unable to make a greater impact on the consumers due to restraints like low adoptability.

The hospital visits to see healthcare providers for an illness have always been prioritized when compared to tech-based platforms, such as telehealth to reach out to healthcare professionals for management of their health needs. The recent Covid-19 outbreak has completely altered the healthcare landscape. Since the corona-virus epidemic, doctors around the world have been inundated with calls from patients seeking information on symptoms and other features of COVID-19.

According to the ***pre-existing literature***, Lack of Awareness and right information among healthcare professionals and patients, institutional limits, lack of communication, and uncertainty regarding duties and responsibilities were all cited as challenges in home health care.

The large-scale adoption of the technology-based home health is till slow paced. However, the behaviour of today's consumer as well the health provider has become more acceptable towards HH, and predicted to grow in the near future.

The ***aim of this study*** is to assess the home healthcare market in India, and how digitalisation has transformed HH amid COVID-19. This study is also focussed to observe as to how Indian consumers have a changed behaviour towards the virtual visits, and technological HH during the pandemic.

2. Research Question

How has digital advancement in the era of COVID-19, brought a change in the home healthcare sector in India?

3. Research Objectives

- To assess the home health care market w.r.t to market growth, drivers and trends
- To analyze the digital transformation of Home Healthcare amid COVID-19
- To study the consumer behavior and preferences towards digitized home healthcare during COVID-19

4. Review of Literature

"Bhatia et. al" (2021) conducted a study on Telehealth and COVID-19. The author has aimed to study the various aspects of telehealth in India in terms of the facilitators or drivers for the telehealth initiatives. The study has briefed scenarios from a consumer's perspective before and post COVID-19. This article was beneficial in understanding the macro-economic, technological, social and other demographic factors in India. This study helped to understand the perceptions of consumers towards telehealth services, its growth drivers and restraints.

Another study that supported the growth of telemedicine services in India during the COVID-19, was conducted by "**Garg et. Al" (2020).** The author also summarized its impact on public health in "low-and middle-income countries. Barriers and challenges to adopt telemedicine were factors like socioeconomic determinants, digital literacy, linguistic barrier between the provider and patient and unawareness among the existent services. The study has also explored the possibilities through which the barrier could be reduced, like training, change management techniques, and improving personal patient to provider interaction.

"Agarwal et al." (2016) The author has assessed the importance of technology for patients to utilize the services through Home Health, and also studied the need and accessibility of home health provision among Indian Patients. The results showed patient preferences associated with the provider-patient communication via telephone call, video chat, etc.

A Study by "KPMG" on "**Healthcare 3.0 Re-imagining healthcare in the next decade"** (2020) has explored the drivers of change and trends that would be seen in the coming time. `The developing "digital disrupted business models", "consumer buying behaviour", and impact of digitalisation as levers of change in healthcare in India. The forces transforming future Indian Healthcare system, would be big leap towards UHC, system strengthening, and digital health

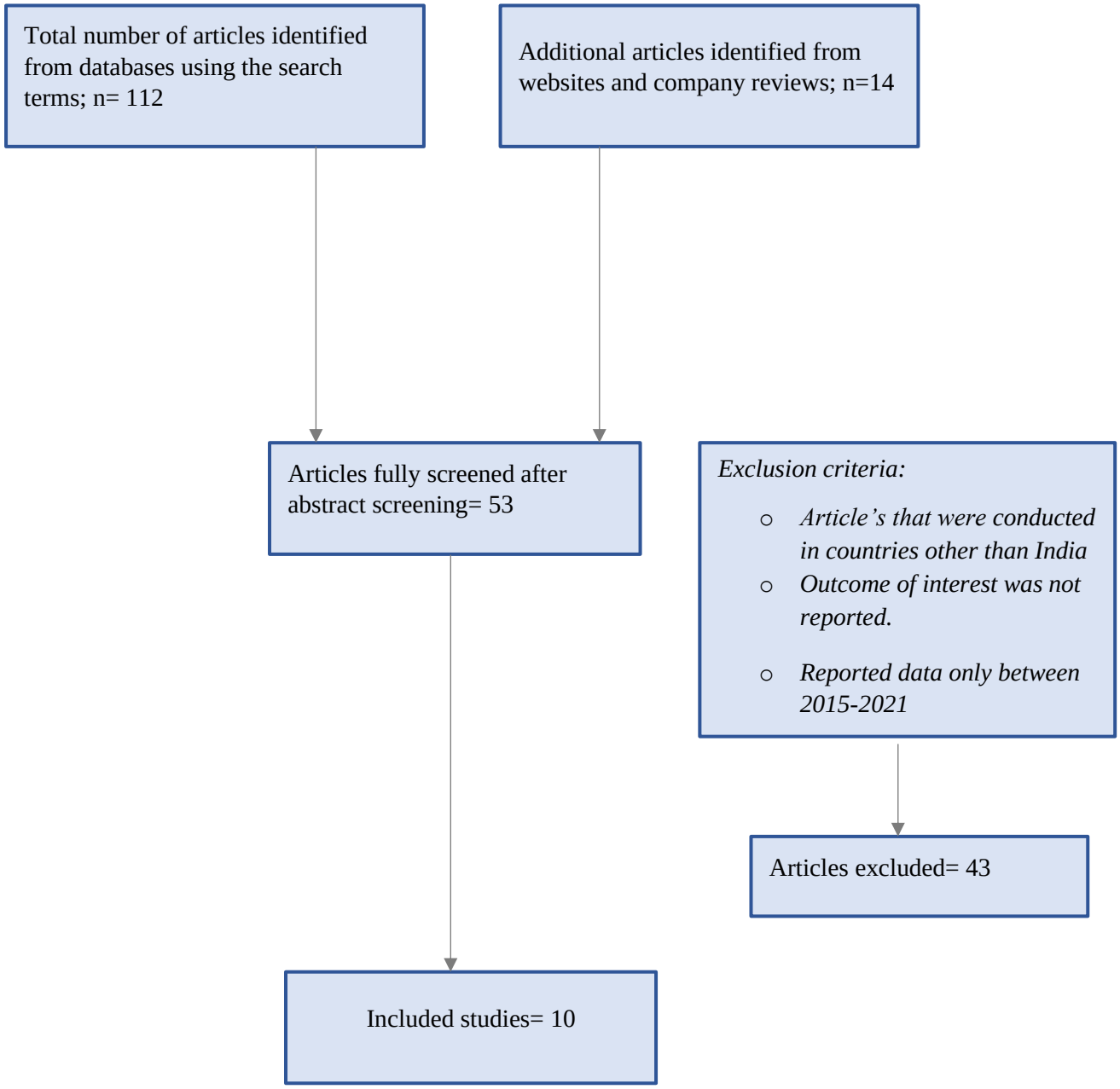
Lastly, a review article by "Ernst & Young" on "**Digital Enabled Home Health"** indicates the benefits of digital enabled home health and the speculated reasons why

it has become extremely important for the healthcare providers and private sector to contribute to the fast growth of this effort**.** This study has also given a detailed view of the conventional setting of a home-based model and the key determinants, benefits, risks and how could a conventional setting be converted into a digital enabled home health.

5. Research Methodology

- A ***Desk Research or secondary research*** was conducted using the existing literature to find out the research outcomes
- ***Type of research***: Quantitative assessment based on the secondary data
- ***Search strategy***: The search was conducted to identify research articles that reported the recent advances in the home health care in India. The key terms used were: - Home Health OR Digitized Home Health, Home Health trends, teleconsultations, COVID-19, perceptions of patients regarding HH, Virtual care, Value based care, technological advancements in HH, Trends AND drivers of HH market, Indian health care, Digital home, Hospitalization rate, COVID-19 impact. MesH terms were used for each database and the search was confined to English. In addition, articles and reviews were manually searched to locate any further relevant study which met the inclusion criteria.
- This study has been carried out using the data from the year 2015-2021. As the objective of the study aims to find the technological advancements in home health during COVID-19, the existing literature before 2015 have very few studies on the digitalization in home health.
- The following ***electronic database*** were searched to locate the Impact of technology in home health during COVID-19: Google Scholar, Science Direct, PubMed, Embase
- Other than the above-mentioned databases, data was retrieved from press release, news articles, company review articles, market reports, company publications and Crunch base
- Market assessment of home health models and digitized health care has been caried out. Parameters like market size, CAGR, drivers of growth, and current trends of the market has been used.

Figure 5.1 Flowchart for literature search process



6. Results

On the basis of the secondary research conducted using the search strategies mentioned in the methodology, ten studies have been utilised to find out the research outcomes. ***Table 6.1*** briefly depicts the literature authored and salient features of the respective studies used.

Table 6.1 Summary of the literature authored

Author	Objective	Study location	Methodology	Salient features
"Bhatia et. al" (2020)	Study on various aspects of telehealth in India in terms of the facilitators or drivers for the telehealth initiatives: before and post COVID-19 scenario	India	Empirical Study	According to the study, 'healthcare need of individuals', 'accessibility', 'technology use' and 'information seeking behaviour', and 'perceived ease of use of telehealth'
"Anthony et.al" (2020)	The author aimed to give recommendations & guidance to healthcare providers to tackle the COVID-19 using telemedicine services	-	Rapid literature review	The findings concludes that telemedicine services hiked and, few healthcare providers used the services in spite of the usage. The author has suggested that there is a need to provide training for a better care delivery
"Healthcare 3.0 Re-imagining healthcare in the next decade" (2020)	To determine the key factors of change and trends that India would observe	KPMG (India)	Study using existing literature	Development of 'digital disrupted business models', 'consumer buying behavior', and 'impact of technology' as levers of change in healthcare in India.

				These factors would help achieve the UHC and health system strengthening
"Delivering digital enabled home health" 2020	The author determined the drivers that are equipped to deliver digital enabled health home care and the importance to fasten its's growth	Ernst & Young	-	"The conventional setting of a home care model, change drivers, and value-based reimbursements, and digital enabled home care: global outlook"
"COVID-19: A catalyst to change (2020)"	Author has analyzed the effect of COVID-19 on healthcare systems	Deloitte	Literature review	COVID-19 impacts and how these current crises will be reshaped by factors like economy, society, technology and sustainability"
"Changing consumer preferences towards healthcare services: The impact of COVID-19" (2020)	"To understand the consumer behavior and changing preferences and expectations from healthcare providers"	Deloitte (India)	"Survey based study" (Survey across 419 consumers)	"Key actions for health care professionals have been developed based on the analysis of the answers to promote consumer engagement and prepare organizations for the post-pandemic world,"
'Agrawal et.al (2016)'	"Assessment of the adoption of a home health provisioning system in India. Paper based and online survey was conducted for the study"	-	Paper based online survey	"Patient willingness for extra payment to access the HH services was likely due to information and communication technology (ICT) via computer, email, text messages, or telephone call
'Garg et. al' 2020	"Telemedicine adoption during pandemic and its	India	Review of existing studies	"Barriers and challenges to telemedicine adoption and the way forward"

"Telemedicine: Embracing virtual care during COVID-19 pandemic"	impact on public health in lower-middle income countries like India: A review"			
"Transformation of the patient journey in a virtual healthcare setup in the new normal" (2021)	"To brief the various initiatives taken by the Government of India and private healthcare providers in developing the virtual healthcare space while exploring global virtual healthcare trends and the leading practices that can be drawn from them"	PwC (India)	-	"Government initiatives towards strengthening virtual health, COVID-19 and disruption in the patient life cycle, and its challenges"

6.2 Home Healthcare market

6.2.1 Home Health: Market Size and Growth

"The in-home healthcare business model is bringing a revolutionary change in the India's healthcare industry." Home health includes nursing care, bed side assistance, Chemotherapy, Rehabilitation, Diabetes and CKD care, Physiotherapy, Mobility assist, Telehealth & Telemedicine, infusion therapy, etc. "*According to ICMR study* and ET, India accounts for 20 % of the global diseases, and out of which India constitutes just 6% of the global hospital beds, and 8 % of doctor and nursing staff."[13]

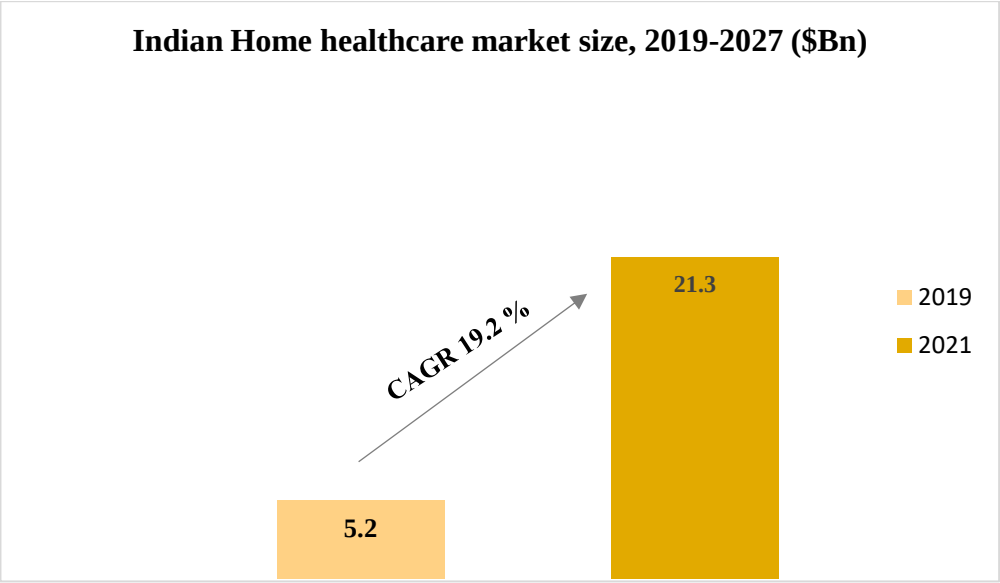
In India, the home healthcare can be elaborated with aspects like remote diagnostics, monitoring devices, home e-consultation services, mobility devices, medical supplies and telemedicine.

Home health care allows for more personalized care, which aids in the development of trust and a collaborative approach to recovery, as well as faster and more effective healing due to the convenience of being in a less stressful environment, fewer health risks, undivided attention, and a reduction in the need for prolonged hospitalization, all of which is a cost saving alternative for the patient.

"Indian home health is currently sized at 5.2 billion, currently growing at a CAGR of 19.2 % which will reach 21.3 billion during the forecasted period 2019-2027"[14]

Home healthcare is a boon in current situation because of the ongoing pandemic, as it will improve the patient safety as well as cost effectiveness in cases of mild to moderate COVID-19 cases. Another factor that will be emerging in the near future is the evolution of smart consumers pertaining to healthcare. The main focus of the healthcare providers and systems lies in the interest of the consumer's or patients experience and satisfaction

Figure 6.2.1 **Indian Home healthcare market size, 2019-2027 ($Bn)**



Source: Grandview research

6.2.2 Market Drivers

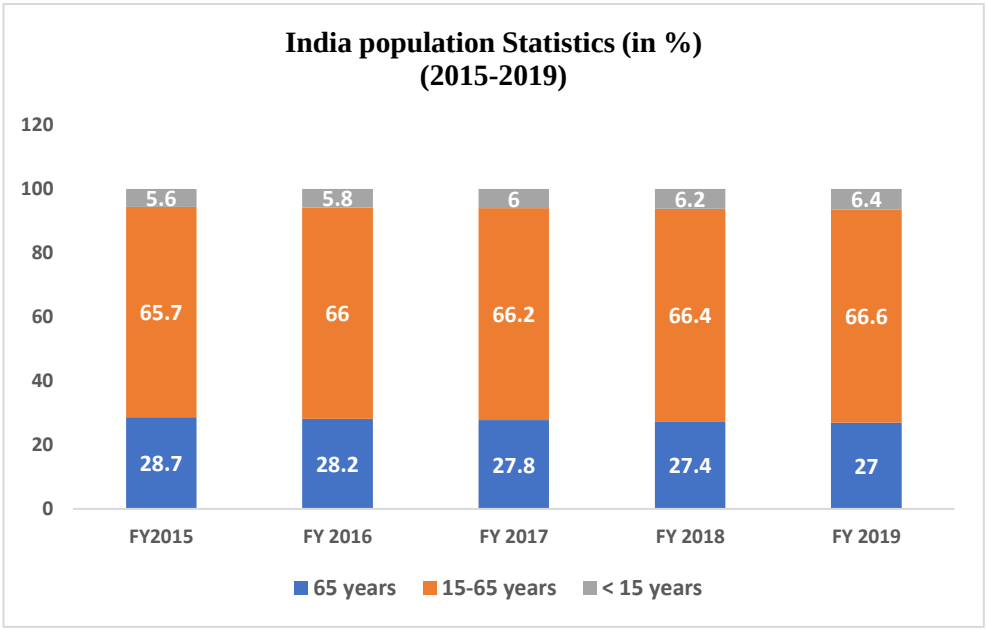
The market drivers of home healthcare include:

- ***Affordability:*** Home healthcare is an extension of hospital services into the patient's home, providing individualized care from a trained healthcare personnel. It is a cost-effective option with effective clinical outcomes, since patients save approximately 20-50 percent on an average when compared to traditional hospital treatment, depending on the services used."[15]
- ***Personalized care:*** The adoption of various technology-based care has resulted into increased personalized care among the patients. Today's consumer is more informed, aware and demands personalized data
- ***Nuclear family structures:*** In the past few years, the traditional joint families have been reconfiguring into nuclear families, which has increased the demand for home health care
- ***Increased hospitalization rate:*** "A study by economic times, revealed that home healthcare has the potential to replace up to 65% of unnecessary hospital visits in India and reduce hospital costs by 20%."[13]. As there is an increased hospitalization in the past few years and in the current times, the burden of providing convenient patient care is rising. Home health is expected to reduce the hospital expenses and OOP by 15- 30 % for mild- moderate disease severity

.

- ***Rising geriatric population:*** India has been witnessing a tremendous increase in the old age population. A collaborative home health care programs are needed for these people to provide them with better primary, and palliative care. The demographics in the figure 6.2. 2 suggests that in the near future a greater number of people will fall in the category of old population. Home health care services must be specifically planned and coordinated packages of care geared to assist the elderly in receiving the services they require while remaining in their own homes.

Figure 6.2.2: India Population Statistics (in %) (2015-2019)



Source: OECD & Data labs

- ***Increasing incidence of chronic diseases:*** The disease burden of chronic diseases is rising in India. Hospitals are under a lot of pressure to deliver services at their facilities, especially in critical care. According to government and private hospital statistics, around 40% of hospital patients have chronic conditions such as "heart disease", "Diabetes", "Stroke", and "(COPD)". Thus, there is a drastic need for effective home health services as the burden of chronic diseases are escalating, in order to facilitate affordable patient care.[1]

6.2.3 Market Trends of Home Healthcare:

The most crucial emerging trends of HH are: -

- ***Increasing consumer compliance and willingness towards home healthcare:*** The consumer behavior has transformed over time with an increased willingness to access affordable care without the restraints of time, place, and commute.
- ***Rising willingness to get an insurance coverage:*** Previously, the home health services were not covered under general health insurance in India or by the private insurers. However, with the wake of COVID-19, it was observed that patients suffering from chronic diseases couldn't get access to hospital beds as the number of operating beds were consumed by the COVID-19 patients. Hence, the patients who are accessing home health services, have shown a growing willingness to be covered under the insurance
- ***Digital revolution or technological advancements in the healthcare industry:*** The adoption of technology-based health care in India will revolutionized the home health business model. The detailed impact of technology on HH are discussed in detail in section 6.3 and 6.4.

6.3 Digital Transformation and in Home Healthcare

Digital technology has led the world to the cusp of evolution, in proving digitalized health care to the patients. The digital health or technology is one of the major factors that will drive the home healthcare industry amid and post COVID-19 era. Also, there has been a significant change observed in the government, being more captivated towards the implementation and development of digitized healthcare in India. *COVID-19* has elevated ***digital technologies*** *leveraged in* ***home healthcare*** *like* ***Telemedicine, Teleconsultations, AI Based Care Platforms, And Remote Patient Monitoring***

Advancements in the technology like connected devices, wearables, remote diagnostics and monitors, AI has enabled the healthcare providers to keep a better track of their patients remotely at home. Emerging technologies like telemedicine and innovative diagnostics is also predicted to a major driver for the home health industry in India.

The **current business models of home healthcare** are focussing upon the integration of various digital technologies into the conventional models. The internet adoption among the Indian population and smartphone users are growing at a high pace. Hence, a patient has an access of information at one place, which allows them to make an informed decision about one's healthcare needs. The providers are supporting a fast-paced integration of these tech-based services into the home healthcare, so that the consumers can access **doctor consultations 24*7, remote diagnosis, and medicines delivery** at their door step.

6.3.1 Digital technologies used in home healthcare:

- ***Telemedicine services*****:** The technology will drive the demand in telemedicine services, and would be equipped with latest 5G connection. The upcoming telemedicine services (via telemedicine apps/devices and centres) would be highly acclaimed among the smart consumers. "*According to Statista, In India, Telemedicine services will witness a market size of approximately 5500 million US dollars by the year 2025."*[16] "Tele-home health care one of the segments of telemedicine, monitor patients from a central station with the help of a Computer Telephone Integrated (CTI) system for 24-hour vitals monitoring."
- ***m-health*****:** In the recent times, healthcare delivery is encouraged in the form of m-health among many consumers.

India is the third largest smartphone market in the world, it would be challenging for the healthcare providers to shift from a conventional healthcare delivery to mobile based delivery of health. In the post COVID-19 landscape, m-health will be increasingly used in the doctor consultations, booking appointments, e-pharmacy, maintenance of health records, and monitoring of patients

- ***Internet of medical things (IoMT)*: "**IoMT" is a "network of medical devices that feed vital data in real time and software application, which analyse and communicate with health systems". Connected medical devices such as "ultrasound", "thermometers", "glucose monitors", and "ECGs", used for tracking patient's health, "smart beds" in hospitals, medication dispensers at home that automatically feed the data into cloud ecosystem, shows the intensity of IoMT in India's healthcare industry.
- ***Digitization of EMRs:*** *According to KPMG 2020*[17]**,** the private sector in India shares almost 75 % of the outpatients and more than 60 % of inpatients, but there still lacks collaboration in the medical records. GOI has initiated schemes like PMJAY, which include private establishments for sharing the patient's health information. Hence, the private health players have to maintain an extensive health record of the patients that can be further linked to patient's health records
- ***Remote-Patient Monitoring:*** During the pandemic, remote patient monitoring has been a boon for heart patients. The remote patient monitoring refers to as keeping a track of the patient remotely using connected device. For example: Remote monitoring of heart patients using the cardiac devices enables the doctor to directly monitor the patient's condition using a small monitor at home, while saving costs and reducing the number of physical visits to the hospitals.
- ***Virtual Consultations/Tele-Consultations:*** "Virtual consultation is basically a video conference between a doctor and a patient from the comfort of their respective homes." Since the past two years, the virtual consultations or on call doctor consultations have been increased. COVID-19 has accelerated the usage of online consultations as people were scared to step out for getting treatment. Also, a greater number of consumers demand to receive all the medical data on their mobiles at the comfort of their homes. Virtual consultations have also increased the penetration of health insurances

6.3.2 Traditional models of HH vs Digital enabled HH: -

The traditional models of home care include nursing homes, physiotherapy, home diagnostics, mobility assistance, Nutritional support etc. More of the traditional home health models are based on the long hours of nursing facilities at home. Nursing care at homes are a bit similar than the clinical hospital setting with respect to acquiring infection. In the home setting, the residents are in a continuously interacting with each other and share same spaces for all the daily activities. Similarly, in a hospital the nurses are at a higher risk of getting infected because of the daily contacts with patients. Hence, these are the few challenges faced in a traditional home health model.

On the contrary, Digital enabled home health care is a viable solution amidst the COVID-19 crisis as it will keep the vulnerable and older people at a distance. As the health system in India is majorly focused upon the chronic diseases, growing older populations, the coronavirus has strongly influenced the healthcare and pharmaceutical industry to tackle the challenges by expediting the **adoption of digital technologies into the home-based model.**

Digital technologies have the potential to stimulate an impact based on two aspects: moving the site of care to anywhere, at any time, and shifting the care model to preventive, personalized, and participatory care. However, in order to implement at a large scale efficiently, more time and effort would be required.

Healthcare organizations must invest in new 'technology-enabled home health care' models to fulfil rising citizen needs. These models must prioritize delivering solutions that are tailored to the demands of end users and how best technologies can be customized in their homes.

According to the figure 6.3.1, the Indian consumers would witness a new paradigm shift from the clinical hospital setting to a more personalised care, which offered physical care, wasn't cost effective and created a lot of stress among the patients. On the other hand, the new models of HH would incorporate a more "connected consumers", "personalised treatments" and "connected healthcare providers". With the current ongoing situation of COVID-19, the implementation and adoption of the digital technologies in HH is growing at a quite fast pace.

Figure 6.3.1 A Conventional HH model vs Digital enabled HH

Source: PwC analysis

- **Benefits of digital enabled home healthcare:**

  *The digital enabled home care has benefits like***:**

- Facilitates the assistance for safe living at home
- Provides the monitoring of vital signs
- Reduces the hospital admission and inherently focuses upon mobility, remote diagnostics, chronic pain management, medication compliance
- Cost effective care: The health at home has the ability to improve predictive monitoring, which will reduce the cost of delivery of care up to 19-30 % when compared to inpatient care.

- **Risks & Challenges digital enabled home healthcare:**

- Information breach: The users have the right to ownership of their personal information. And, it is the responsibility of the tech and IT management to adhere to the individual's right under data protection law
- Trust in digital technologies
- ***Challenges in the adoption*** of digitized home healthcare are ***listed below***:

1. **Technological challenges during care delivery**
2. **Attitude and behavior barriers of consumers towards Digitized home health**
3. **Legal and regulatory barriers**
4. **Financial challenges and no reimbursement of home health in India**

6.3.3 Digital Transformation of HH amid COVID-19

With the ongoing COVID-19 pandemic, e-pharmacies and teleconsultations have significantly increased in India. As strict lockdowns have been imposed all over country and social distancing norms, e-pharmacies in the home health segment has enabled consumers to abstain from human interaction. The adoption and implementation of these services in home health model has been underdeveloped for many years now. COVID-19 has helped scale up the adoption of digital services in HH, making the tele consultations and e-pharmacies the new normal for the patients as well as the providers. Virtual care embedded in the home healthcare creates a system that enhances the patient-health provider interaction and leads to a personalized care. The digitalisation has enabled people to access these services at the comfort of their home. It demonstrates the role of digitalisation in reducing the burden at the hospitals while caring for the patients at home.

Recent developments associated with the tech based HH in India are:

- Prior to the COVID-19, hospital chains have started to provide their consultations online, while E-pharmacy have made the medicines available 24*7 using an online platform. Apollo is the oldest (ATNF) and the largest multispecialty provider of the tele health services in India. Fortis Healthcare has observed a shift from 10 % of the OPD consultations moving towards teleconsultation platforms even before COVID-19 era.
- Telemedicine hub was launched in Delhi amid COVID-19 to provide counselling to the residents, contact tracing, real time monitoring of health vitals and introduction of telemedicine portal for patients
- According to an article Live mint, Practo reported five crore Indians who accessed their services online during the first phase of lockdown between March 2020 to May 2020.
- *According to Indian express*, a '**rise of 500 percent'** was witnessed in the teleconsultations during COVID-19. Among those, '**80 percent' of people** were first time users. With this hike in teleconsultation services, there was a '**decline**

of 67 percent' in **physical visits.** Out of the overall teleconsultations, there were three specialties; general physician, gynecology and dermatology.

- The top HH players in India have been carrying out 200-500 teleconsultations per day since the start of COVID-19 pandemic. These platforms have observed an increase in online consultations up to 500 % post COVID-19.
- According to the EY analysis[2], approximately 80 percent of doctors are using audio calls, texts/video calls, to connect with the patient for providing care.
- E-pharmacies provide a comfortable and affordable solution to book medicines online. Most of the E-pharmacies conjoint with teleconsultations services as well, hence these two segments have accelerated the growth of HH as well as increased the willingness of the consumers to pay for the services. "As per Ernst & Young's primary survey, e-pharmacy industry is expected to account for 10%-12% of overall sales in the next five years. This will however be at the backdrop of strong regulations especially around issues such as data privacy and substitution. Leading online pharmacies in India have also reported an increase of 50%-100%. However, this will occur against a backdrop of stringent restrictions, particularly in areas such as data privacy and replacement. Leading Indian internet pharmacies have also reported a "50 percent to 100 percent" surge in sales.

6.4 Home Healthcare amid COVID-19 in India: Consumer's Perception

"COVID-19 has affected nearly 2.99 crores people in India, with 3.88 deaths till the month of June 20th, 2021."[18]

In India, as there is a lack of proper health infrastructure. According to "WHO recommendations", the standards of healthcare force suggests that there should be "1 doctor per 1000 patients", whereas India just have "0.65 doctors per 1000 patients". Similarly, India lacks nurses and hospital beds when compared to the WHO norms. In India, there are "1.3 nurses and hospital beds per 1000 population". Hence, there is an immediate need of scale up of the healthcare force and infrastructure. The burden of chronic conditions like Diabetes, Cancer, etc. have already been over exhausting the public and private hospitals. The COVID-19 situation has just made it worse, infecting around more than 100, 000 people in the country. Among these, many required critical care like oxygen beds, cylinders, remdesivir injection etc. Due to these prevailed conditions, chronic patients have been compromising with their medical attention needs. COVID-19 has embarked a fear among the patients of acquiring the infection. Several reasons have been presented in the below mentioned pie charts.

The Deloitte[3] ***studied the consumer perception amid COVID-19 which have been presented below in Figure 6.4.1.*** Figure 6.4.1 suggests that **sixty-two percentage** consumers strongly agreed that they were afraid to take the hospital visits for any kind of treatment and diagnostic facilities. Maximum consumers feared to go to the hospital because of COVID-19 infection. Whereas, two percentage of consumers think that a hospital or a clinical setting is a better way to access the health services.

Figure 6.4.1 Consumer's perception on hospital visits amid COVID-19

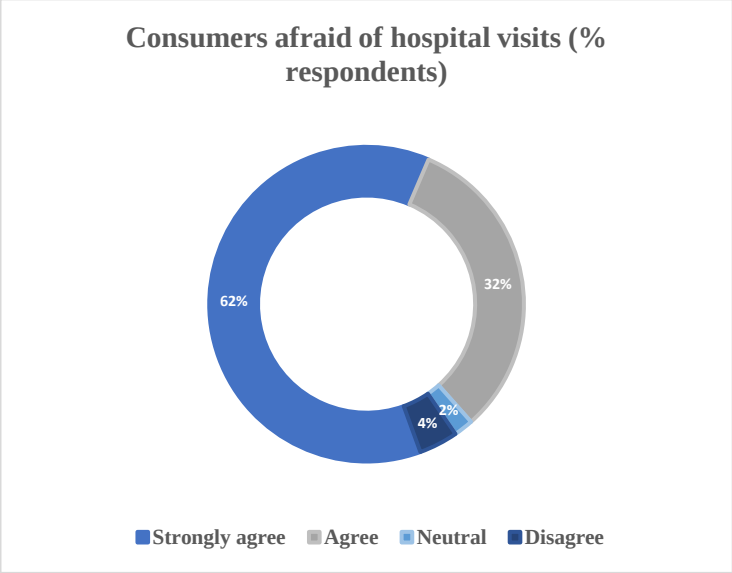


Figure 6.4.2 indicates that around thirty and forty-five percentage of consumers strongly agreed that they had concerns of managing their health during the COVID-19 lockdown. While, only five percent and two percent showed minimum to no concerns or fear about their health management during these times.

Figure 6.4.2 Consumer's perception on management of their health during COVID-19 lockdown

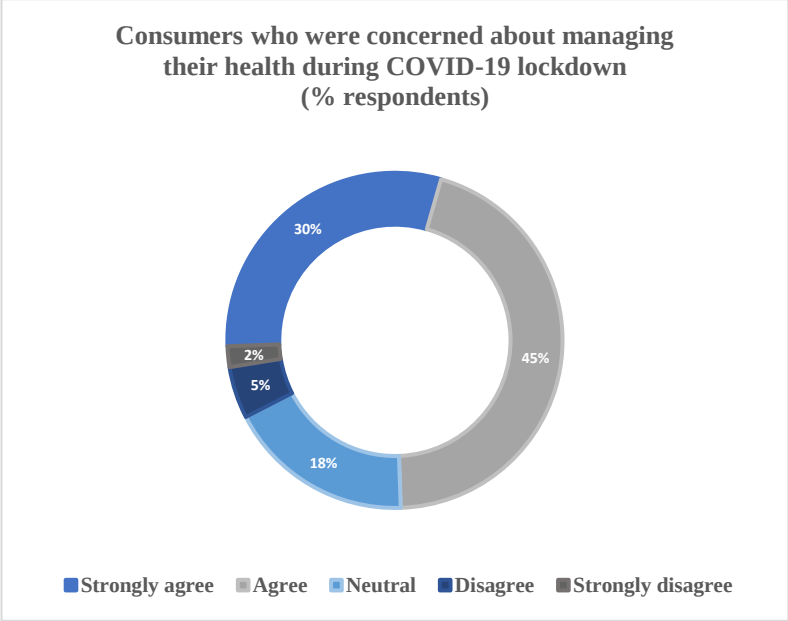
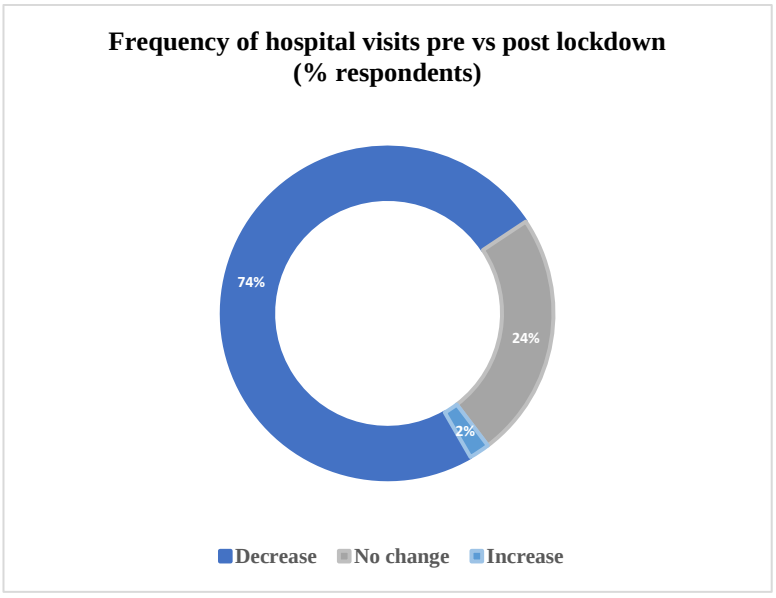


Figure 6.4.3 suggests that seventy-four percentage respondents prefer not going to the hospitals after the lockdown. Respondents stated that the reason of their changed preferences for staying at home was fear of getting the infection, affordability and convenience.

Figure 6.4.3 Consumer's perception on frequency of hospital visits pre vs post lockdown



Source: Figure (6.4.1, 6.4.2, 6.4.3)

Impact of COVID-19: Deloitte

"Virtual care constitutes of tele–consult, telepathology, teleradiology and e–pharmacy and is experiencing an encouraging stimulus in India due to the pandemic." Hospitals,

NGOs, and other healthcare providers have realized the ability and need of the digitized home health.

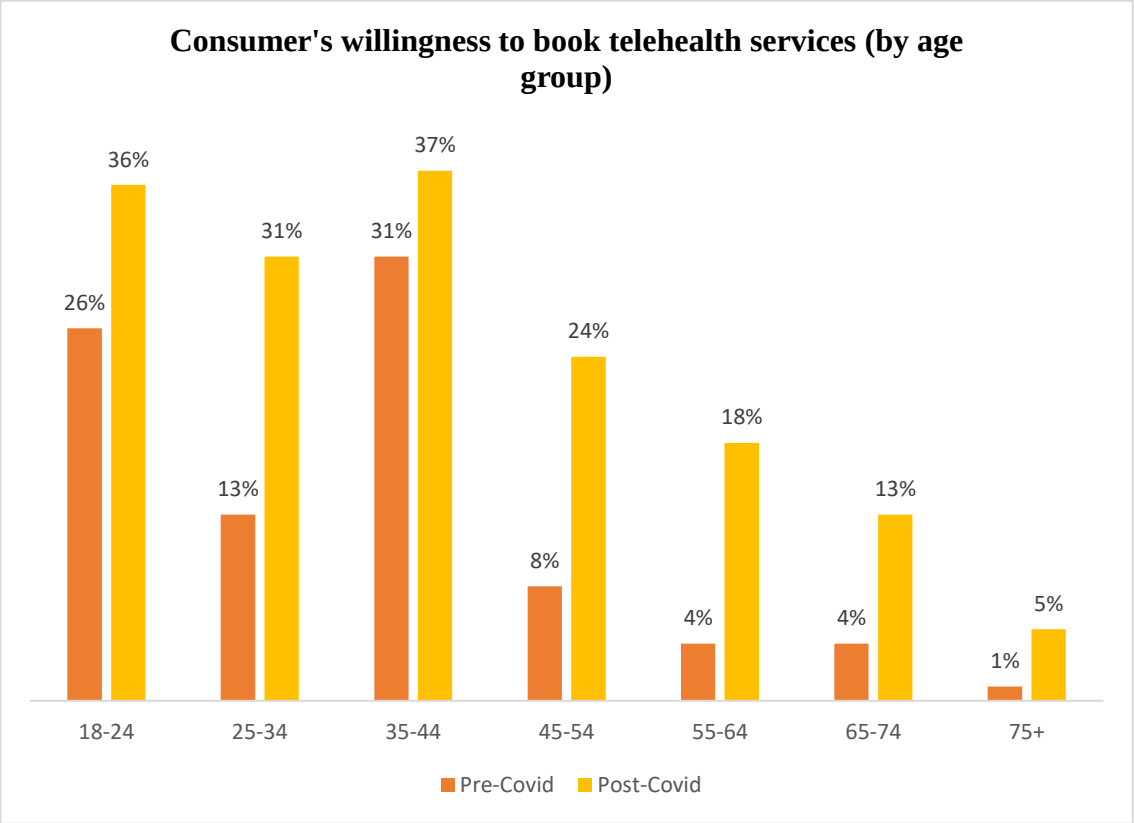
The willingness of the consumer towards adoption of teleconsultations and virtual care have increased over the years. These services have become more significant during COVID-19, as there is a growing demand for digitized home care, hospitals and pharmaceutical companies are coming together to facilitate the connect between the doctors and patients.

According to the EY survey[2], which included 12 pharmaceutical companies in India, it has been observed that 80 % have tied up with one or more market teleconsultation platforms, 8 % have launched its own platforms while rest of them have been trying different means to adopt teleconsultations.

The figure 6.4.4 depicts the willingness of the consumers to book the telehealth or teleconsultation services[2].

The willingness to adopt the teleconsultation services was mostly observed in the age groups of 18- 24, 25-34 and found to be highest among the age groups of 35-44. There was a significant jump of 13 percent to 31 percent, associated with the teleconsultations before and after COVID-19 landscape. Teleconsultations had prevailed since many years now. However, the telehealth adoption was quite growing at a low pace, But, COVID-19 has resulted into a tremendous shift in the adoption of these services in India. The other factors contributing to its fast adoption are; rising awareness among the consumers, a need for personalized healthcare delivery, better network connectivity and connected platforms between the doctor and the patient.

Figure 6.4.4 Consumer's willingness to book telehealth services (by age group)



Source: EY–Parthenon's Life after COVID–19 Survey, 2020

A survey also suggests, the reason for opting teleconsultation by the consumers depends on two parameters:

- Convenience: While other patients indicated that better access of the doctors, medicines and the avoiding the commute were the favorable reasons to opt for tele-consultations
- Safety context: Patients wanted to avoid long queues, and prolonged waiting times

One of the most tremendous changes that have been noticed in COVID-19 period were the approaches, consumers have used to access the healthcare. Since, the norms associated with COVID-19 have shifted the patient care away from a clinical setting to a home-based care model. “Also, the stay-at-home guidelines have led to a high digital literacy and initiated more acceptance towards the digitized home healthcare.”

Digital tools like *smart patches* that track the vital signs have allowed patients to better manage and monitor their health at the comfort of their homes. In the future, virtual care solutions would also pave a way for the patients to integrate their own health generated data with the technologies.

It can be summarized as the awareness and adoption of the tech-based home services were more prominent among the young and working population of India. As previously discussed, the whole healthcare industry is shifting towards providing value-based care, the technology-based care would be more convenient. “However, the digitized home health needs a more feasible mode of consultations that the Indian population demands, mainly due to lack of robust platforms, lack of awareness and involvement of stakeholders to make the tech-based care scalable.”

7. Discussion:

- Home health care has brought vital changes in the patient care at the convenience of their home. Some of the factors burdening Indian healthcare system are increasing prevalence of chronic diseases, ageing patients and higher inpatient costs at the hospital.
- It is estimated that NCDs will have a share of '74% of total deaths' by 2030 (compared with 56% in 2008) with Cardiovascular, Cancer and Diabetes accounting as a major disease.
- The Home health model is also estimated to grow because of the growth drivers like nuclear family structures and a rising need for personalized care.
- Besides the other benefits like convenience, and low costs, home health also aids in critical care, post-operative needs, and time saving
- As the COVID-19 has infected crores of people in the country, the healthcare has been overburdened with respect to the doctors, nurses and infrastructure. Home healthcare including the digitalization would reduce the rate of infections in a hospital setting.
- There is a rising need for the health care industry and the pharmaceutical industry to integrate a faster adoption of home-based model while providing affordable and patient centric care.
- "According to Devi Prasad Shetty, with life expectancy increasing significantly in India, home health care is becoming mandatory"
- The home-based models have already been picked up in the developed nations like USA and there have been fastening developments in the tech-based home care models.

- In India, the adoption of the home healthcare system has been slow over the decades mainly due to the reasons- HH is a consumer sensitive market, issues of awareness among the population, employee retention and lack of standard training protocols.
- Therefore, the role of technology or the health digitalization over the time is a key growth factor for the home health sector in India.
- With the growth of various technological advancements in the health industry like teleconsultations, e-pharmacy, virtual visits, m-health etc. the technology has supported the growth by strong execution of the doctor-patient interaction.
- The recent developments of the AI diagnostics, remote patient monitoring and smart monitors/wearables have brought a change in the conventional ways of care giving.
- Another major drawback the digitized home-based model is facing are due to the low margins in the home healthcare industry, hence, the providers must expand to remain profitable. [1]
- The COVID-19 pandemic caused technology adoption to rapidly accelerate as organizations implemented new digital tools, often taking risks with unproven technologies.2 Physicians, in turn, quickly learned and incorporated the new tools in their practice, including virtual visits, remote monitoring, and analytics.
- The current stakeholders have been trying to improve the patient experience by collaborating with leading hospitals and pharmaceutical companies.
- The home health care competitors are increasingly adopting the digitalized systems to create efficient patient and doctor platforms for delivering care
- During COVID-19, India has witnessed tremendous changes in consumer's willingness towards the adoption of digitized healthcare. From the data collected, it can be interpreted, that consumers have growing concerns of acquiring the COVID-19 infection upon visits. Some of the consumers had issues of travelling, higher costs and convenience
- According to the data collected, it can also be summarized that the consumers have an increased willingness to opt for the teleconsultations when compared to the pre COVID-19 period.
- The HH has become need of the hour, resulting into increased involvement of the HH companies and also attracting investors to help in the advancements of a comprehensive platforms for a better consumer experience.

- Home health providers like “Practo has gained significant scale with a direct-to-patient application-based solution, gaining an edge by offering a package of services that combine remote medical consultations with insurance claims filing, electronic health records, and linkages with traditional networks of doctors and hospitals”.
- Meanwhile, “Apollo Health, has begun to set up “teleclinic center’s” in rural locations. Video chat technologies available in clinics allow patients to speak directly to doctors, while health extension workers at the clinics are able to perform tasks like checking blood pressure, which must be done physically. Apollo’s teleclinics have achieved significant scale, offering 10 million specialty teleconsultations.”

8. Conclusion

Home health care is likely to become an integral part of the services offered by hospitals and independent start-ups. Digital enabled home health would emerge as a disruptor of the conventional medical settings. There is a significant need to cover the gaps between faster moving technologies and its scalability in the HH.

Additionally, if the home health services to be covered under the health insurance plans, it would lead to a higher uptake of the same. Secondly, there should be standard protocols provided by the healthcare providers associated with HH. With proper governmental support, regulatory organisations, as well as medical and industrial organisations, are supporting disruptive business models. Associations have historically played an important role in setting healthcare delivery regulations. Associations will serve a dual purpose. To boost adoption, they must engage stakeholders such as doctors and pharmaceutical companies and address their concerns through policy making.

“Customers are increasingly choosing to have their medical needs met remotely, in the privacy and comfort of their own homes. They expect their healthcare providers to place a high priority on following safety protocols. They're also receptive to a longer-term engagement with providers with whom they've built trust and confidence.” Innovative businesses in the field are already recognising these patterns and developing tech-enabled solutions to address them, which are projected to grow in the future.

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