

**“TO STUDY THE USE OF DIGITAL
TECHNOLOGY FOR GERIATRIC HEALTH CARE
DURING COVID-19 PANDEMIC IN INDIA”**

Dissertation submitted to



The IIHMR University, Jaipur

For the partial fulfilment for the award of the degree of

Masters of Business Administration (MBA)
in
Hospital And Health Management

By

Dipshi Aggarwal
Under the Supervision and guidance of
Dr. Dhirendra Kumar

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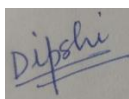
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DECLARATION BY STUDENT

I hereby declare that this dissertation titled “To study the use of digital technology for geriatric health care during COVID-19 pandemic in India” 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.

A small, square image showing a handwritten signature in blue ink. The signature appears to be 'Dipshi' with a horizontal line underneath it.

Name of Student: Dipshi Aggarwal

Date: 20 June, 2021

CERTIFICATE FROM FACULTY GUIDE AND SCHOOL DEAN

CERTIFICATE

This is to certify that dissertation titled “**To study the use of digital technology for geriatric health care during COVID-19 pandemic in India**” is a record of the research work undertaken by Dipshi Aggarwal 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 her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide

IIHMR University, Jaipur

Date

Dean

IIHMR University, Jaipur

Date

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List of abbreviations

CGA- Comprehensive Geriatric Assessment

COVID-19- Coronavirus disease of 2019

DHI- Digital health interventions

IoT- Internet of things

MeSH- Medical Subject Headings

nCOV- Coronavirus disease

PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SLM- Systematic Literature Mapping

VA- Veterans Affairs

VVC- VA Video Connect

Chapter 1: Introduction

Geriatric care is “a speciality that is based on improving the health care for elderly people.”⁴ It helps in improving the health in elder people by illness and disability prevention and treatment that can be usually seen as people age. Geriatric nursing entails providing assistance to the elderly at their homes, in hospitals, or in special institutions such as nursing homes, mental institutions, and so on. The most common health problems that people suffer in old age include “hearing loss, cataracts and refractive errors, back and neck pain and osteoarthritis, chronic obstructive pulmonary disease, diabetes, depression, and dementia”.² Not only this, but comorbidities are also usual in this age group. Also, they are distinguished by the complex health problem that occur in the older age groups, usually known as geriatric syndromes. Nearly 120 million old people in India suffer from a variety of physical, psychological, economic, and spiritual issues.¹

Digital health has become a very important asset to meet the health requirements of people. The word ‘digital health’ is derived from eHealth, which is defined as “the use of information and communications technology in support of health and health-related fields”¹³.

There are various digital technologies that are used for healthcare. The main ones are¹⁰ :

1. Telemedicine and health information
2. Data analytics and intelligence, predictive modeling
3. Remote sensing and wearables
4. Bioinformatics tools
5. Patient -physician-patient portals
6. DIY diagnostics, compliance, and treatments
7. Health and wellness behavior modification tools
8. Digitized health record platforms
9. Medical social media
10. Imaging
11. Decision support systems

The potential for using technology to assist healthcare delivery has been brought to attention by the COVID-19 pandemic. Due to limitations in person-to-person interaction, clinicians, patients, families, and carers have begun to use technology in conjunction with

innovative models of care to interact with clinicians, patients, families, and carers. The solutions which have been adopted include the application of video conferencing (for clinical assessment, handover, and education), social media (for communication and involvement with both professional and lay audiences), and more intentional use of current cloud storage (for example, to share resources), email, and telephone services.

So, using digital healthcare technologies for the elderly will be very beneficial because they are the ones who are the most vulnerable during this pandemic.

In an analysis released by Lancet, it was forecasted that the young population in India will decrease by 182 million by 2100.¹² That means that the older population in India will increase, thereby it is very necessary to make provisions to take measures for geriatric care, their health being a primary focus.

In India, many mobile apps have been launched, their functions range from increasing the accessibility to health information for people living in rural areas (National Health Portal India mobile app) to searching doctors, hospitals, diagnostic centres, and pharmacies to doctor -doctor or patient- doctor OPD National teleconsultation (eSanjeevni).

Some research studies have been conducted to study the use of digital health technology among the elderly and the perception of elderly towards it. But by doing this study the use of digital health for geriatric care during this pandemic in India can be seen on which no study has been performed.

1.1. Research questions

- How can digital technology be used for geriatric health care during COVID-19 pandemic in India?
- What are the strengths and weaknesses of using digital technology for geriatric health care during COVID-19 pandemic in India?

1.2. Research objectives

- To study the use of digital technology in geriatric health care during COVID-19 pandemic in India
- To study the strengths and weaknesses of using digital technology for geriatric health care during COVID-19 pandemic in India

Chapter 2: Review of Literature

Table 2.1. Review of Literature

<u>Study Title</u>	<u>Year</u>	<u>Objective</u>	<u>Methodology</u>	<u>Key findings</u>
“Digital Health Interventions among People Living with Frailty: A Scoping Review” ⁶	2021	The purpose of this study is to give an overview of Digital health interventions (DHI) used in frail elderly people.	Based on Population, Concept, and Context, a scoping review was conducted using PRISMA standards. 105 studies were included that fulfilled the eligibility criteria.	DHI was mainly used for monitoring in the frail older population, which contained either a sensor-based technology distribution mechanism or a feedback content for consumers or feasibility assessment.
“Internet use and need for digital health technology among the elderly: a cross-sectional survey in China” ¹¹		The research was conducted to identify the use of internet and digital health technology in the elderly in China and the factors influencing this use.	A cross-sectional study was conducted for people above the age of 60 years, who were randomly chosen from 13 cities in Heilongjiang province. A survey was conducted for a total of total of 669 subjects using questionnaires	The study subjects were more inclined towards smart bracelets, emergency callers, telemedicine, and online health consultation and very few of them used internet for medical bill payment and appointment registration are done through online mode. Age, marital status, sex, monthly income, level of education, number of friends, and social participation were the main factors influencing the use of digital technology.

			from May 1 to July 31, 2018.	
“Older adults’ perspective on using digital technology to maintain good mental health: Interactive group study” ³	2020	This study was conducted to explore the factors which motivate or hinder the use of digital technology (apps and websites) to support a good mental health by the older adults.	A qualitative study was conducted among a total of 15 older adults aged 50 years or older. Interactive techniques were used to understand the experience of the study subjects with the application of digital technology in order to promote mental wellness.	Self-reliance, averting loneliness, normalization, facilitated expression were found to be some of the motivators and fear of consequences, the impact of low mood on readiness to engage with technology, and a lack of prior knowledge of digital technologies were some of the barriers for digital technology use to improve mental health among older adults.
“Usability of a self-administered geriatric assessment mHealth: Cross-sectional study in a geriatric clinic” ⁹	2020	The study's goal was to evaluate the applicability of a geriatric assessment smartphone application that is self-administered.	A cross-sectional study was conducted, which included 72 study subjects from a geriatric practice from Ain Shams University Hospital, Cairo, Egypt.	The mHealth geriatric assessment is very beneficial in times when physical distancing has to be maintained and it can also provide pre-comprehensive geriatric assessment. Though it cannot replace clinical examination and multidisciplinary standard CGA.

“Impact of IoT on geriatric telehealth” ⁵	2020	The goal of this study is to understand the advantages of using Internet of Things technology for geriatric telehealth.	An exploratory case study was conducted, and data was compared between rates of re-hospitalization of those who used telehealth services in comparison to individuals who did not use telehealth services.	Rate of re-hospitalization decreased in the patients using telehealth services in comparison to those patients who did not use telehealth services. People using telehealth were also shown to be taking better care of their health.
“Mobile applications for elderly healthcare: A systematic mapping” ⁸	2020	The purpose of this research was to understand the use of mobile applications for elderly healthcare.	A SLM was done of 149 papers that met the eligibility criteria.	It was found that the majority of mobile apps related to the elderly health were concentrated on Personal Health Tracking category, which shows that there is a great deal of interest in mobile application-based health monitoring services.

“VA Video Connect for Clinical Care in Older Adults in a Rural State During the COVID-19 Pandemic: Cross-Sectional Study” ⁷	2020	The aim The goal was to see if elder veterans were capable and willing to engage in a VVC visit during the COVID-19 pandemic.	A cross-sectional study was carried out. Telephonic interviews were taken of 118 older veterans at Central Arkansas Veterans Healthcare System.	There were many factors affecting the use of VVC visit. Some that were identified in this study were access to the proper equipment, internet access, and the education status of the patients.
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Chapter 3: Methodology

3.1. Process of Literature collection:

Secondary research was done with the help of two electronic databases, i.e., PubMed, and Google Scholar, for searching research articles related to the chosen topic using a set of keywords as shown in Table I.

The final search query is used to access the articles associated with the concept of this research study. The first, second and third search queries were used to identify with the different references to COVID-19 pandemic, Geriatric healthcare, and digital technology, respectively. All the keywords are used with appropriate Boolean operators, OR and AND. All the fields were searched like titles, abstract and subject heading like MeSH. To further refine the search, the results were filtered to include only the articles from 2020-2021 and those written in English. The search includes all articles obtained from databases until May 21,2021.

Table 3.1: Search query

Query	Keywords (that searched all Fields i.e. within titles, abstracts, subject headings like MeSH)
1	“Novel Coronavirus” OR “Coronavirus” OR “COVID-19” OR “nCOV”
2	“Geriatric Healthcare” OR “Elderly Healthcare” OR “Older Healthcare”
3	"Digital Technology" OR “digitization” OR “digital transformation”
Final Search Query	1 AND 2 AND 3

A total of 783 studies (Google scholar=47, PubMed=736) were identified initially, using the above search query. After removing the duplicates and after applying the inclusion and exclusion criteria, a total of 220 articles were identified. In this research study, 7 articles are included that directly correspond to the research objectives.

3.2. Inclusion Criteria:

- All the articles written in English were included in the study.
- Only the articles from the time-period of 2020 to 2021 were considered.
- The articles that have been published were included.

3.3. Exclusion Criteria:

- Articles that did not fulfil the inclusion criteria that is specified above were excluded from the study.

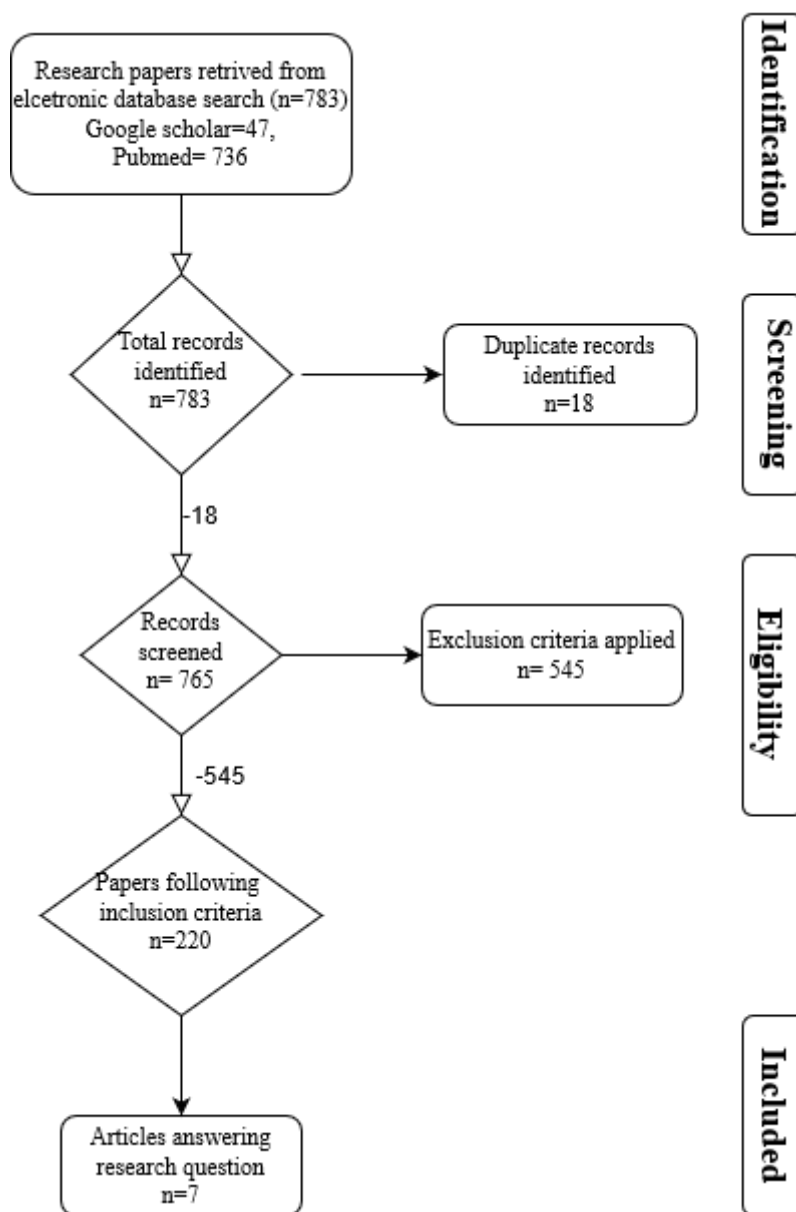
3.4. Screening of literature:

To identify and remove the duplicate articles from the two sources, EndNote was used in which the all the citations of the research paper were uploaded. Then the duplicates were removed. Except this, all the articles not following the inclusion criteria were also removed. Aside from this, the research papers that were not relevant to the study or did not directly answer the research questions were also removed.

3.5. Data Extraction:

Information was extracted from seven articles that were obtained from 2 databases, Google Scholar and PubMed. Narrative analysis of the study was done to analyse the information because different approach was undertaken in the studies that I have included in the research study. Along with the overall role of digital health technology for geriatric care during COVID-19 pandemic, strengths, and weaknesses for the same was also found using the information gathered from the 7 research papers included in this study.

FIGURE 3.1: Flow Chart Showing Methodology (made using draw.io)



3.6. Data collection:

Secondary data has been used for this study. The data has been extracted from Statista. This data is being used to corroborate with the findings of the literature review that has been done.

Table 3.2: Telemedicine market size in India

Year	Market size in million U.S. dollars
2019	700
2020	1100
2021	1400

(Source: Statista)

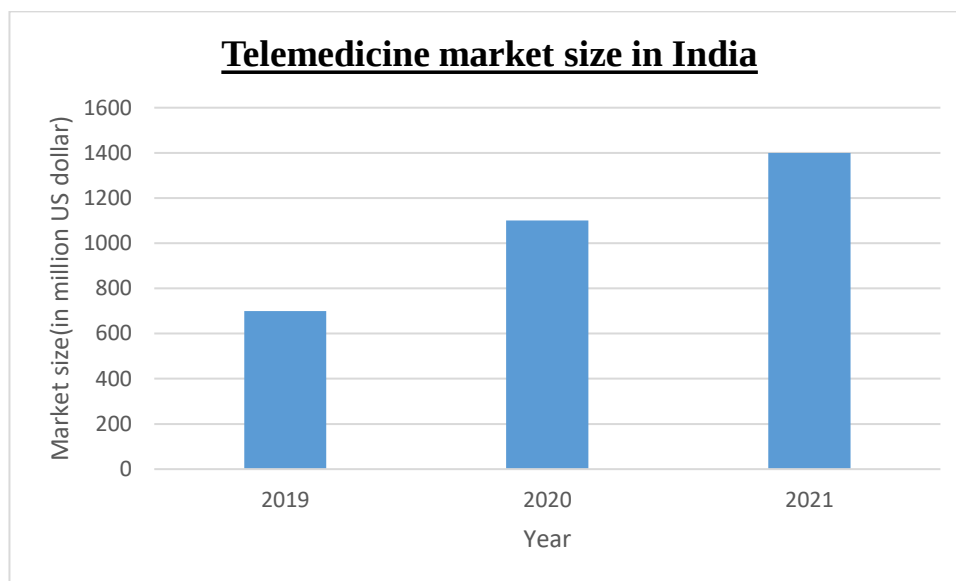
Table 3.3: Inclination to use teleconsultation services during COVID-19 in India

Age	Pre- COVID 19	Post- COVID-19
18-24	26%	36%
25-34	13%	31%
35-44	31%	37%
45-54	8%	24%
55-64	4%	18%
65-74	4%	13%
Over 75	1%	5%

(Source: Statista)

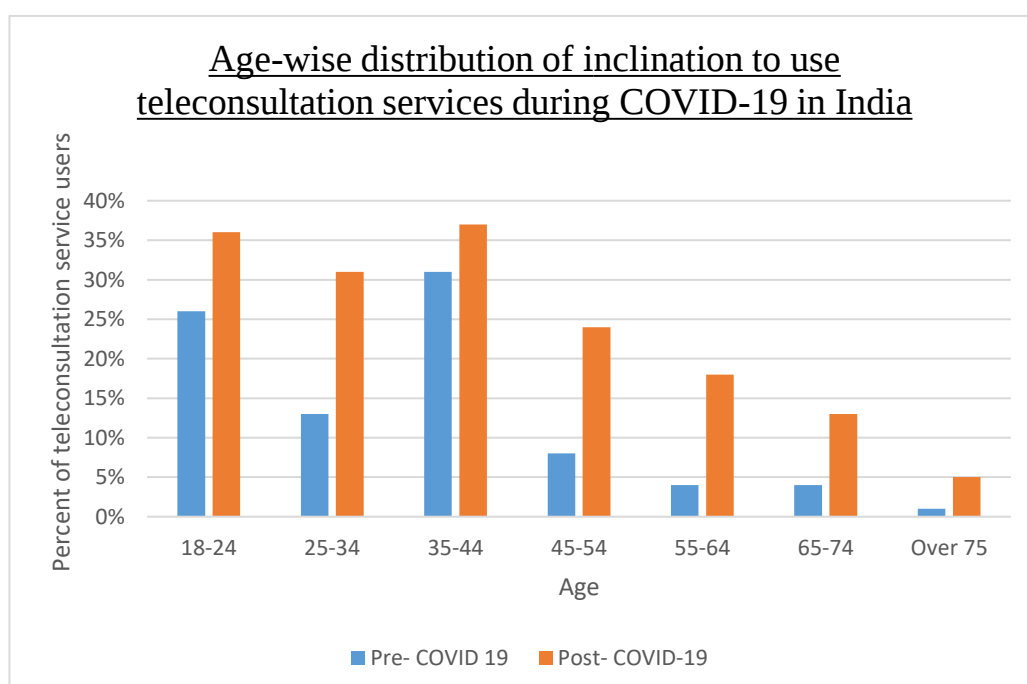
Chapter 4: Results

Figure 4.1: Telemedicine market size in India during 2019, 2020 and 2021



The above graph depicts a clear increase in the use of telemedicine services over the three years. There is a peak increase of 57% in the use of telemedicine from 2019 to 2020. There was still an increase in the use, an increase of 27%, but it was not as peak as that of the previous year.

FIGURE 4.2: Age-wise distribution of inclination to use teleconsultation services in India before and after COVID-19



The above graph shows the age distribution of inclination of people in India to use telehealth consultation services during COVID-19 pandemic. We can see there is a general increase in the willingness to use telehealth services. The same can be observed for people ages 65 and older. There is an increment of nine percent for those in age range of 65-74 years of age and an increment of 4% for those of age 75 years and older. As compared to the increment of other age groups this is considerably low and this may be attributed to the factors discussed above, like Lack of education, proper equipment or internet connection or the fear of loss of privacy.

Table 4.1: SWOT Analysis

Strength	Weakness
1. It can help in providing social connection, thereby reducing loneliness and will help in improving the mental health of the elderly. 2. It can provide healthcare at home, which will help the problem of accessibility and in cases when physical distancing (like during COVID-19) must be maintained. 3. Mobile apps and wearables can help not only help the elderly but also their caregivers in maintaining and keeping track of the health and medicines of the elderly. 4. Less chances of acquiring infections.	1. Low acceptance of digital technologies due to lack of knowledge and fear of loss of privacy. 2. Everything cannot be done through digital technology. It cannot replace clinical care or taking laboratory tests. 3. All the insurance do not cover for telemedicine.
Opportunities	Threats
1. Research and development in this area will also be helpful during the post-COVID period.	1. Lack of knowledge about using digital technology. 2. Lack of proper equipment or internet connection.

Chapter 5: Discussion

This research was conducted to study the use of digital health technology for the elderly population and how it might be useful during the COVID-19 pandemic. The research articles included in the study clearly illustrate that using digital technology can be very beneficial for geriatric healthcare. They have shown to be having a direct effect in improving their healthcare and in helping the older population maintain a better health. Digital healthcare may not be able to substitute clinical care, but it has shown to be effective for pre-clinical check-up. This is especially crucial in the times of COVID-19 pandemic when the elderly are most vulnerable to the virus.

There have been many innovations in the field of digital technology that have been shown to have a great significance in geriatric healthcare. Wearables like smart bracelets, emergency callers, telemedicine, online health consultation, and mobile applications having Personal Health Tracking are being used the most.

Many factors such as age, sex, marital status, level of education, monthly income, quality of life, number of friends, and social participation have shown to have an effect on the use of digital technology by the elderly population for healthcare. Some of the common barriers are lack of knowledge and education about using the digital technology, lack of acceptance, lack of proper internet facilities, fear of losing privacy, and fear of consequences, the impact of low mood on readiness to engage with technology, whereas self-reliance, averting loneliness, normalization, facilitated expression were found to be some of the motivators.

Main advantage includes remote patient monitoring, preventive care, it is more convenient for the elderly and less chances of acquiring infections. The main disadvantages are loss of privacy, irreplaceability of clinical care and unavailability of Health insurance in every digital health service.

Along with this we can clearly see from the graphs above that telemedicine use is constantly increasing in India, especially during the COVID times. Though the use is very low in the elderly population, but it is still increasing. So, it can be very efficiently utilized once we overcome the main barriers.

Chapter 6: Conclusion

There is a huge scope of use of digital health technology for the elderly in India, especially during the COVID-19 times. Though government initiatives like providing telehealth insurance, providing internet connectivity in all areas of the country, and providing education to people about using the gadgets so that they have access to digital health, will go a long way in improving the situation.

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