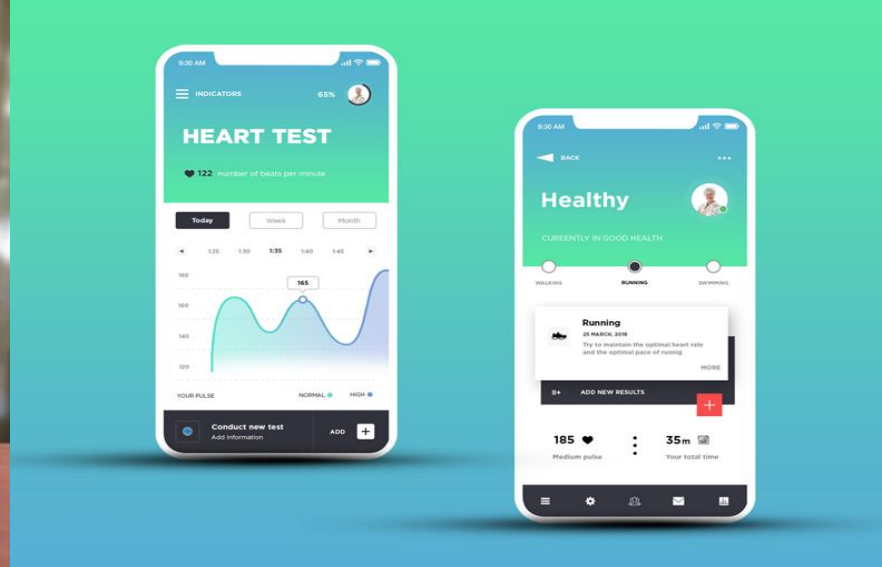




Assessment of Knowledge, Attitude and Practice towards e-Health tool use among Health Professionals before and during COVID-19

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2019-2020

WHAT IS...?

- **COVID-19-** coronavirus disease(COVID-19) is an infectious disease caused by a newly discovered coronavirus.
- **e-Health** – is the use of information and communication technologies for health through the computer and related technologies.
- **Telehealth-** use of electronic information and telecommunication technologies to support long distance clinical health care, patient and professional health related education, public health and health administration.
- **EHR-** electronic health records are real time, patient centered records that make information available instantly and securely to authorized users.
- **e- Prescription-** a way of entering prescription information into a computer devices like a tablet, laptop, desktop computer.
- **e-Consultations-**a way of consulting health professional online.

INTRODUCTION

- With the COVID-19 Pandemic, Health systems and Public Health authorities are facing a major obstruction in terms of patient monitoring.¹A Novel corona virus against which insusceptibility is still a mystery for many researchers.² COVID-19 pandemic has got a world to halt with destruction of economy³ and evidently tremendous negative effect on human life and health with which COVID-19 crisis has become an reality for one and all.
- Keeping oneself mindful with a sound prosperity is an essential right for each person.⁴ It like goes about as a pointer of the monetary improvement of a country and the overall development of the nation.⁵But nowadays in COVID-19 pandemic keeping sound health and in our hand is very challenging which is evident by looking at the current state of our nation.
- As a preventive measure in the midst of Lockdown in COVID-19 individuals are being approached to maintain social distancing and to constrain the outside visit to stop additional spread of Novel corona virus, various people who routinely utilize health services are right now choosing to stay at home and patients and doctors are afraid to see each other face to face.⁶ This has decline the use of healthcare services up to 70% in Out patients visit⁴.

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- This way COVID-19 has challenged a health care sector in different way and has changed the health care seeking behavior overnight, with the virtual health taking front seat to fight pandemic and emphasize the “NEW NORMAL” in terms of health delivery.
- Digital e-Health is an application of information and communication technology (ICT) across the whole range of functions that affect health.
- This New Normal is a strong lobby to restrict physical contact among patients and health care providers ,also called "Medical Distancing" in the attempt to lessen the health-care services related COVID-19 transmissions. Telehealth administrations are quickly turning into a significant power and ensuring wellbeing of health care work force. The viability of telemedicine has been promising in many health areas, including diabetic consideration, dermatology and cardiology; along with excellent in delivering remote health care, while saving the time and minimizing the physical space.⁷

Contd...

- **And against this pandemic backdrop there has been seen a new start for digital infrastructure and services which have come forefront in aid of overcoming this gap and gave a new way of healing from a distance ,which give rise to health in our hands, which earlier saw as an unnecessary service .**
- **This study provides valuable insights into how Knowledge, Attitude and Practice differ among health professionals on use of e-Health App before and during COVID-19 and Aims to see the perception towards e-Health amongst health professionals.**

RESEARCH QUESTION

What is the Knowledge, Attitude, Practice of e-Health use among Health professionals before and during COVID-19 ?

OBJECTIVE

- To Assess the Knowledge, Attitude, Practice of e- Health use among Health Professionals before and during COVID-19.
- To illustrate the perception of e-Health use among Health Professional.

METHODOLOGY

Study Area: Jodhpur

Study Period: May 2020- June 2020

Study Approach: Mixed method study approach (qualitative and quantitative)

Study Sample: Purposive sampling (Non-Probability Sampling)

Inclusion Criteria: Health professionals who were currently using e-Health tool in their practice and one who agreed and were available at the time of study.

Exclusion Criteria: Health Professionals who were not currently using e-Health tool in their practice and were not present at the time of study and one who didn't sign the consent form were excluded.

Data Collection

Study was a questionnaire-based survey. Primary data was collected using the structured questionnaire which contain questions developed in English language, related to knowledge, attitude and practice regarding e-Health use and was circulated via web based google form to the doctors who were currently using e-Health in their practice. Structured questionnaire consists of a consent form, quantitative and qualitative questions.

Type of Data Collection: Mixed (Qualitative and Quantitative Data Collection)

Quantitative: consist of 4 parts close ended questions:

Part 1- Demographic data

Part 2- consists of questions based on knowledge on e-Health regarding objective, platform used, e-Health services given by the health professionals.

Part 3 – consists of the Attitude based questions: five-point Likert Scale ranging from Strongly Agree =1 to Strongly Disagree=5) (Strongly Agree, Agree, Neutral ,Disagree, Strongly Disagree) was used to assess Attitude on questions like does e-Health tool provide satisfaction towards reminders, notifications etc. Does it provide provision of quality of information towards content correct, is e-Health is good to use during COVID 19 like Pandemic.

Part 4 – consists question on practice regarding Frequency, Modality and Avg. patient treated with e-Health tool.

Qualitative:

Descriptive qualitative open- ended question was used to check the perception on e-Health future challenges and opportunities.

Finally, received 81 responses, and these responses were taken further for analyzing, to meet the objective.

DATA ANALYSIS

- Data collected using online google form was further exported to the MS Excel format and interpretation of data collected was done using the graphs and tables and statistical analysis was done using SPSS software (Version 20 IBM).**
- Age was summarized in mean $\pm$ SD, rest all variables are expressed in proportions.**

RESULT

TABLE 1 Socio Demographic Characteristics of respondents:

CHARACTERISTICS	RESPONDENTS n=81
GENDER (%)	
MALE	52(64.1%)
FEMALE	29(35.8%)
MEAN AGE(YEARS)	
MALE	38.63($\pm$ 8.75)
FEMALE	35.86($\pm$ 7.7)
STUDY AREA (%)	
URBAN	61(75.3%)
RURAL	20(24.7%)
WORKING SECTOR (%)	
GOVERNMENT	19(23.5%)
PRIVATE	62(76.5%)
QUALIFICATION (%)	
MBBS/MD/MS/DM	37(45.6%)
BDS/MDS	24(29.6%)
AYUSH/MD/MS	16(19.8%)
BPT/MPT	4(4.9%)

Total of (n=81) responses were received, 34 of which were the existing users of e-Health in COVID- 19 and 47 were the new users of e-Health during COVID-19. Male study participants were 64.1%(n=52) whereas female participants count for 35.8% (n=29). Mean age of male participants was 38.63 years with (SD $\pm$ 8.75), female mean age was 35.86 years with (SD $\pm$ 7.7) (Table 1)

1. Interpretation on start of e-Health use in practice

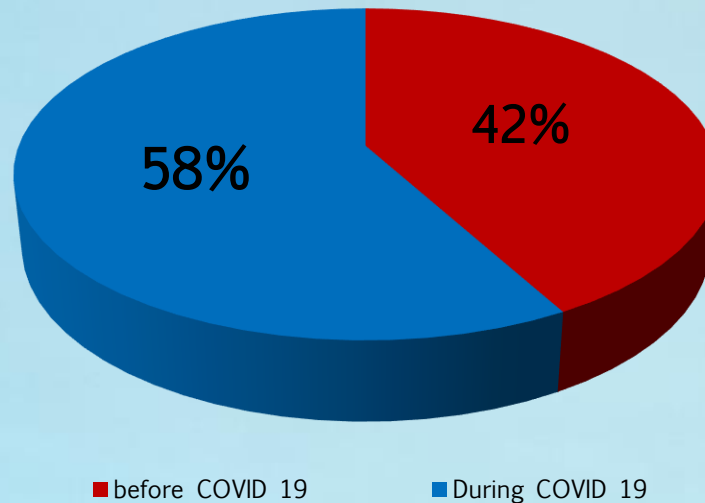


Fig 1: Response to question Since when you are using e-Health tool in practice before or during COVID-19 (n=81)

When asked about the time being use of e-Health tool in practice, (FIG -1) of 81 respondents, 42%(n=34) interpret that they were the existing users of e-Health in the time of COVID -19 , whereas 58% (n=47) were the new users who started using e-Health service during COVID -19.

1. Interpretation towards e-Health Knowledge

2.1. Knowledge of health professionals towards primarily measurable objective of an e-Health system.

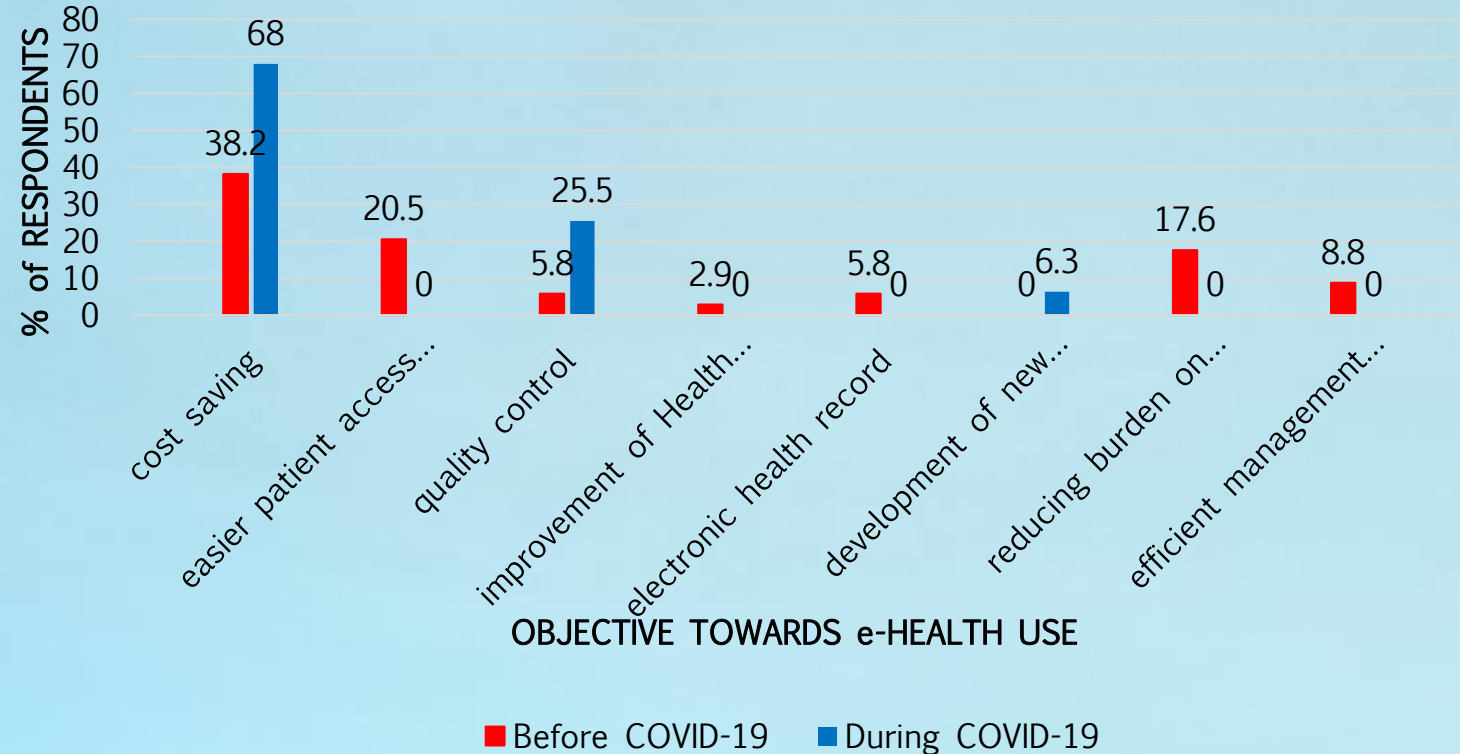


Fig 2.1: knowledge towards Primary measurable objective regarding e-Health use

FIG 2.1 of n=34 Pre COVID-19 eHealth users, 38.2% think e-Health use is cost saving for both patients and providers, during COVID-19 cost saving percentage has risen to 68%, with 25.5% of health providers believe e-Health helps in quality control and 6.3% users targets e-Health in development of new products and services.

2.2 Knowledge of Health professionals towards e-Health Services

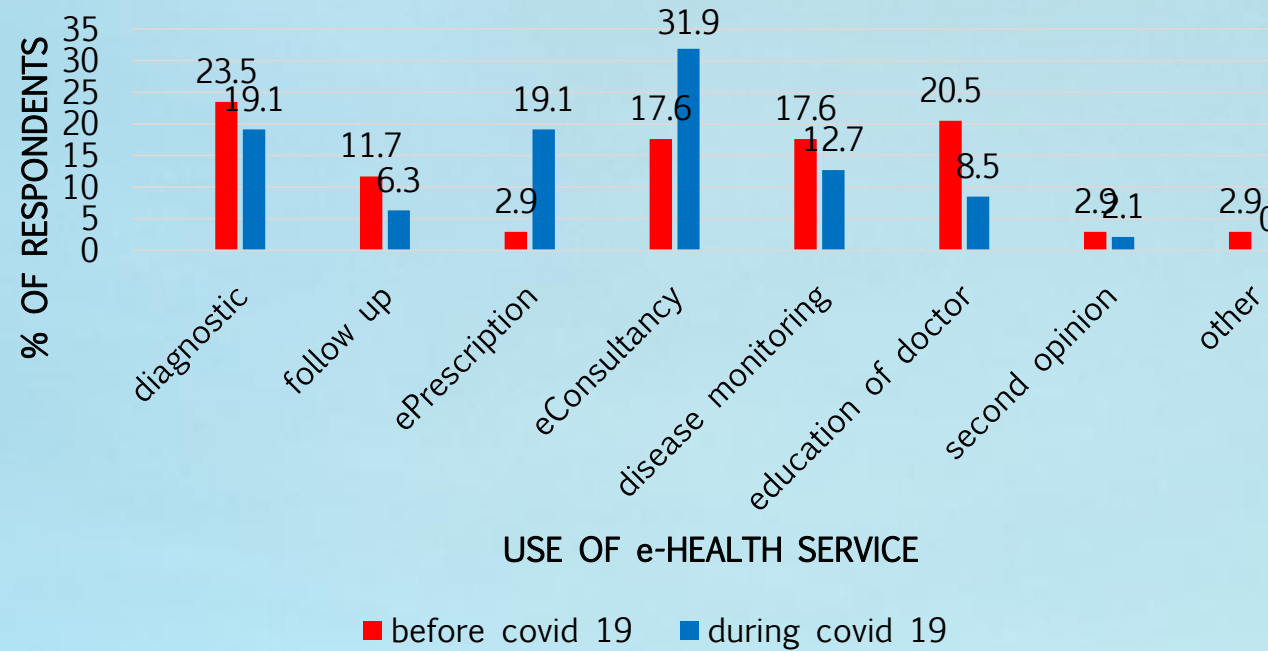


Fig 2.2: Knowledge towards e-Health Service given before and during COVID-19

FIG 2.2 Shows Before COVID- 19 outbreak, all type of e-Health services were delivered by the health professionals, but during outbreak e-Consultancy 31.9%, e- Prescription 19.1% e-health services were increased.

2.3 KNOWLEDGE OF HEALTH PROFESSIONAL REGARDING E-HEALTH PLATFORM

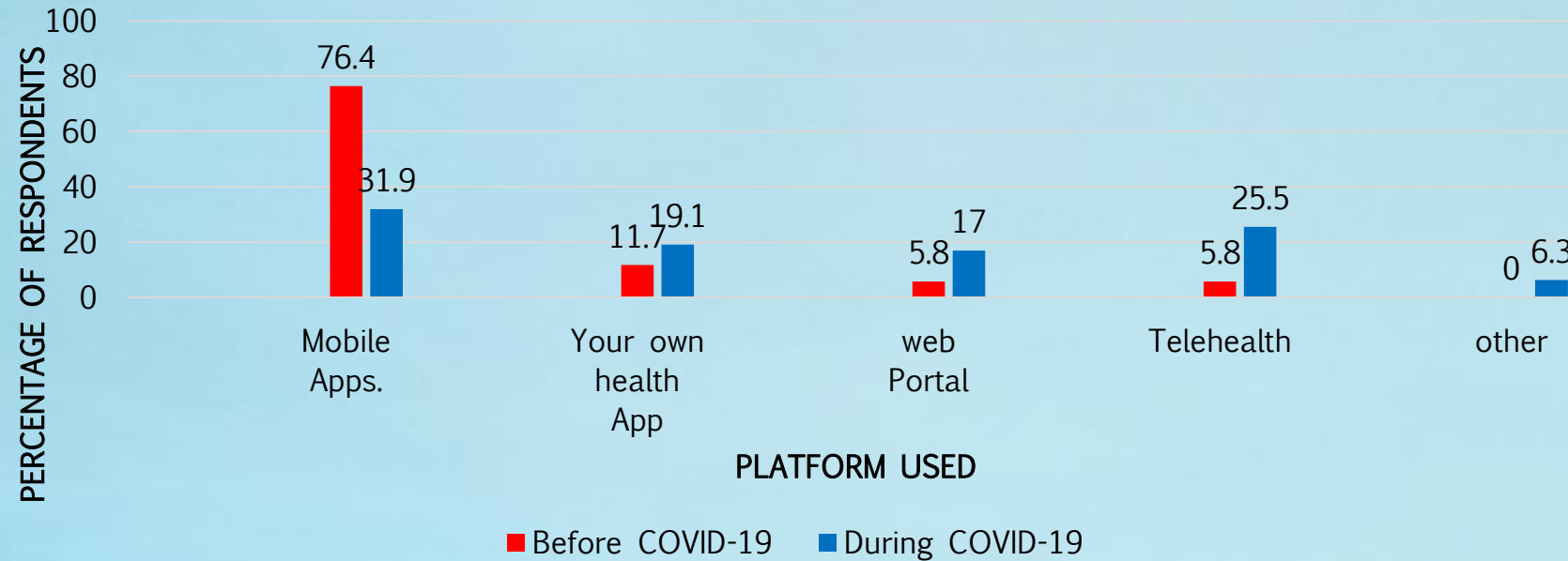


FIG 2.3: Knowledge regarding e-Health platform used for delivering health services

FIG 2.3 Interpret that before COVID-19, 76.4% of health services were given through Mobile Apps, but at the time of COVID-19 the platform is changed to Mobile Apps 31.9%, Telehealth 25.5%, own health App 19.1%.

3 Interpretation on Attitude towards e-Health use

Table 2: Attitude of health professionals towards e-Health tool use before and during COVID-19

ATTITUDE		STRONGLY AGREE (%)	AGREE (%)	NEUTRAL (%)	DISAGREE (%)	STRONGLY DISAGREE (%)	MEAN
Satisfaction On reminders, Notifications	BEFORE COVID-19 (34)	10 (29.4%)	12(35.3%)	8(23.5%)	2(5.9%)	2(5.9%)	2.2
	DURING COVID- 19(47)	20(42.5%)	19(40.4%)	3(6.3%)	3(6.3%)	2(4.2%)	1.8
Quality of information	BEFORE COVID-19 (34)	5(14.7%)	16(47%)	6(17.6%)	7(20.5%)	0	2.4
	DURING COVID - 19(47)	26(55.3%)	12(25.5%)	4(8.5%)	1(2.1%)	4(8.5%)	1.8
Good to use in pandemic	BEFORE COVID-19 (34	9(26.4%)	4(11.7%)	10(29.4%)	7(20.5%)	4(11.8%)	2.9
	DURING COVID - 19(47)	23(48.9%)	11(23.4%)	6(12.8%)	3(6.4%)	4(8.5%)	2.0

4 Association of Knowledge and Attitude towards e-Health use.

Table 3: Association of Knowledge and Attitude towards e-Health use with COVID state and working sector of respondents. (n=81)

VARIABLES	KNOWLEDGE						ATTITUDE					
	Objective		e-Health service		Platform used		Notification alert		Quality of information		Good to use in Pandemic	
	χ^2	<i>P</i>	χ^2	<i>P</i>	χ^2	<i>P</i>	χ^2	<i>P</i>	χ^2	<i>P</i>	χ^2	<i>P</i>
COVID-19 STATE Before COVID-19 (34) During COVID-19 (47)	6.73	.03	33	.84	16.02	0.00	5.44	.24	18.97	0 .00	10.16	.03
WORKING SECTOR GOVERNMENT (19) PRIVATE (62)	5.51	.06	.67	.71	8.55	.73	2.33	.67	. 70	.95	9.00	.06

5 Interpretation on Practice towards e-Health use:

5.1 Modality preferred by health professionals for delivering health services

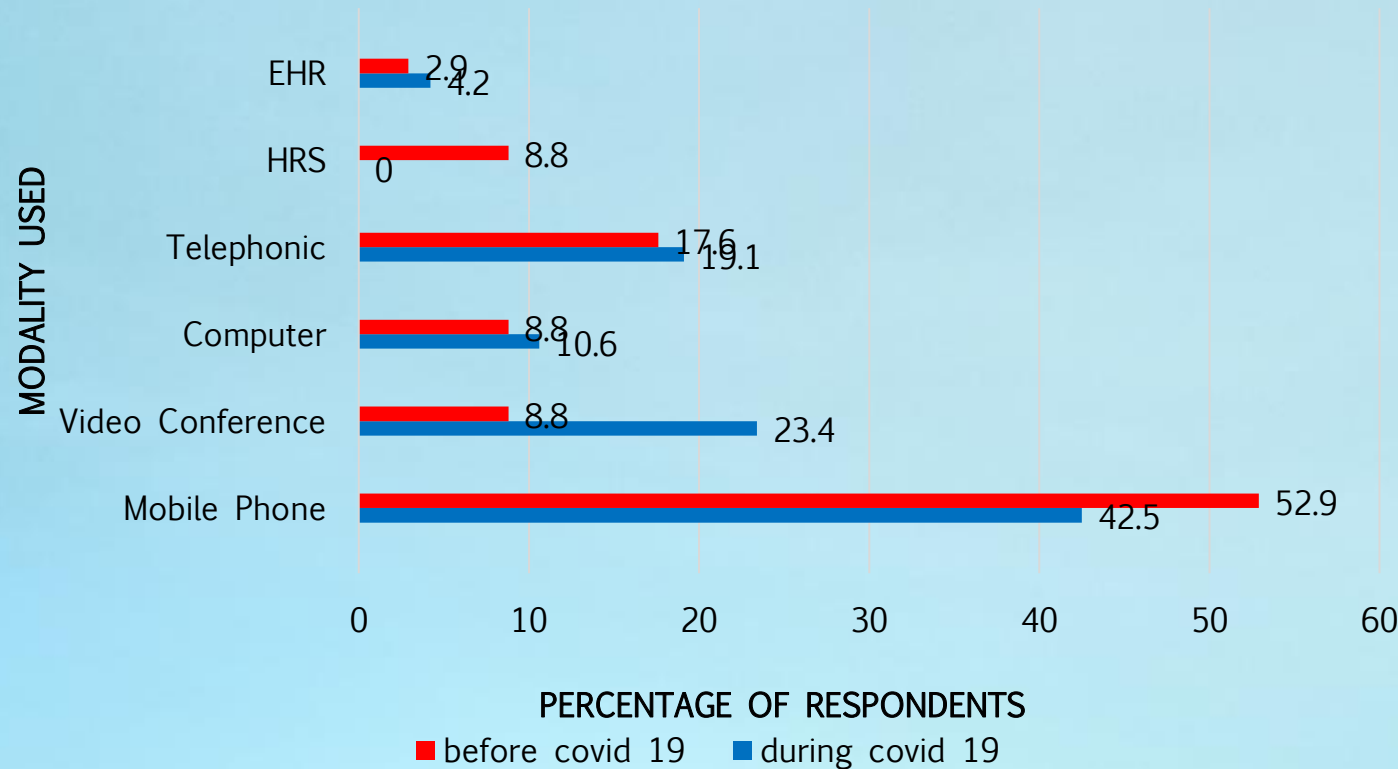


FIG 3.1: Type of e-Health Modality preferred by health professionals before and during COVID-19

Fig 3.1 shows that focus towards modality preferred has been shifted towards video conferencing (23.4%) during COVID-19 which was earlier seen as non-essential mode, along with Mobile phone (42.5%).

5.2 Frequency of e-Health tool used in practice

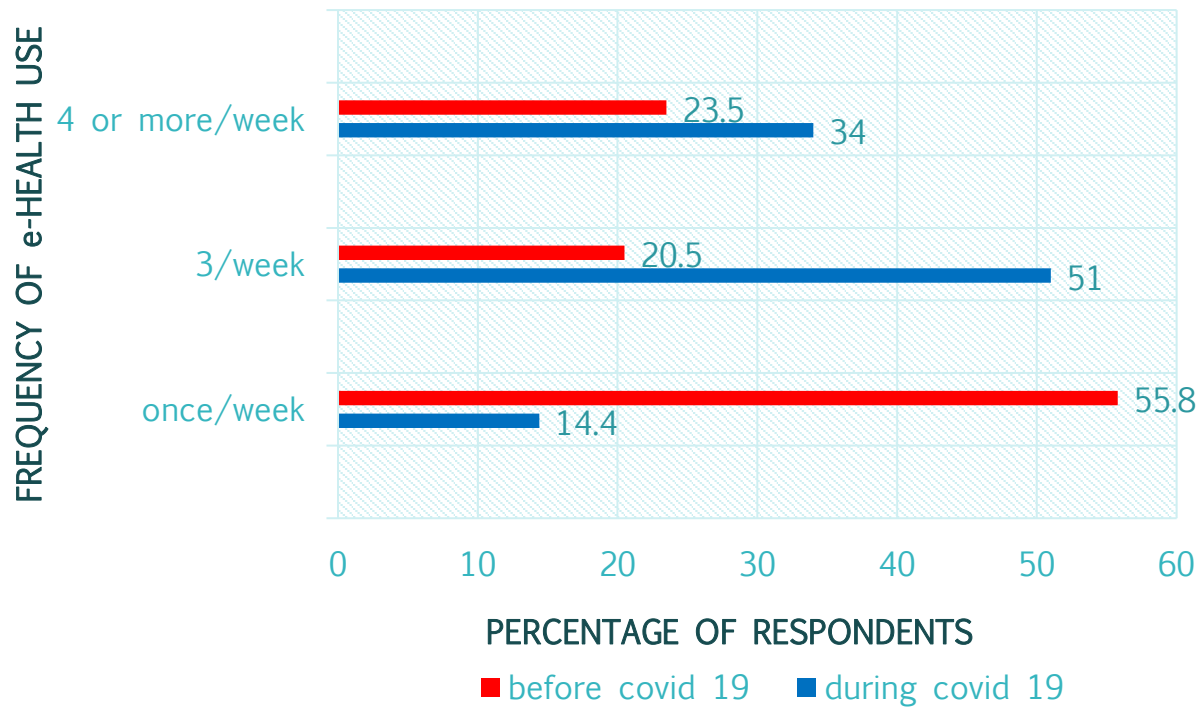


FIG 3.2: Frequency of use of e-Health in practice before and during COVID-19

Fig 3.2 shows Before the pandemic use of e-Health tool in practice was once a week 55.8%, but during the Pandemic the change in frequency is seen to thrice a week 51% and 34% of use is 4 and more times a week.

5.3 Average Patient treated with e-Health tool

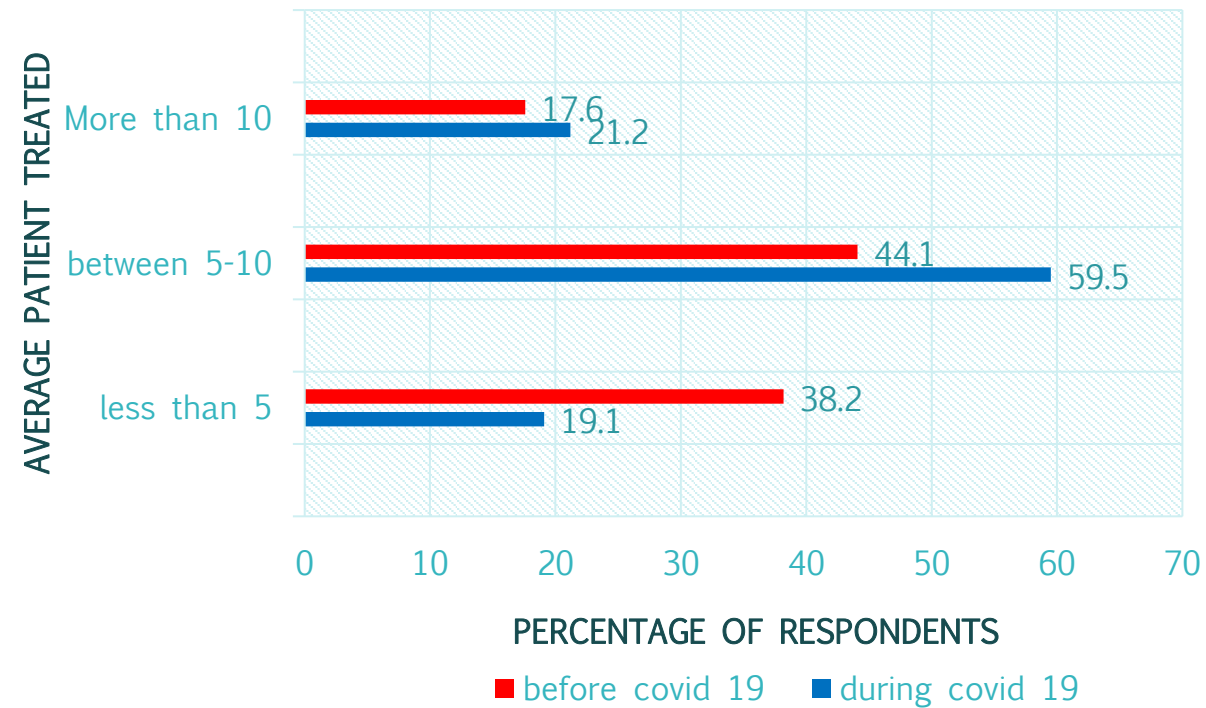


FIG 3.3: Average patients treated with e-Health before and during COVID-19

Fig 3.3 shows During COVID outbreak rise in average patients treated with e-Health tool seen from 44.1% to 59.5% between 5-10 patients and increase 21.2% is seen in more than 10 patients treated, with a decline in less than 5 average patients treated.

6 According to health professionals what future challenges and opportunities e-Health hold:

participants in the study reported concerns about perception of eHealth on future challenges and opportunities

Future challenges:

For proper functioning of e-Health App Good access of internet is required specially in the Rural area. Data security and privacy laws should be confidentially maintained in terms of exchange of communication between doctor and patient. Care givers need to be tech savvy along with beneficiaries. Physical examination of the problems and symptoms of the patients can't be done virtually which is very crucial while diagnosis and prescribing medicines specially of the pelvic region. Due to shortage of IT and resources many a times operational errors do occur.

Future Opportunities:

Self-monitoring and managing of patient being at home in physical therapy, occupational therapy especially for elder people is upmost opportunity of e-Health. e-Health is a good way to heal mental health problems of children via online mental games. e-Health is efficient in managing patients visit to OPD therefore reducing burden on Health care premises and improving quality. Various devices that aimed in quitting smoking, alcohol need to be developed. Apps which manages Breast Care are the present future of e-Health. Need for more development of Home Health Apps like Med- Chat. In COVID-19 like pandemic it is good to use, as with eHealth use patient has freedom of choice to choose doctors in non-emergency cases. Moreover, it reduces the patient travel time and cost, which leads to less pollution and holds paperless data collection, which is an ecofriendly way for the Sustainable Development of our nation. with more e-Health use doctor patient relationship will improve.

Discussion

- In this study, most of study participants were the male(n=52) [64.2%] and with MBBS [55.7%] which is similar to study led by Parvin et al¹⁰.
- Earlier Telemedicine was Catastrophe and pandemic present extraordinary difficulties in delivering medicinal services and the experience before COVID-19 has been mixed. During pandemic backdrop, telemedicine turns into even more significant attribute with its significant potential benefits of Sudden upscaling of virtual care capacity in COVID-19 pandemic has shown a favourable outcome in terms of digital health.¹¹
- To mitigate the further circumstances of COVID -19 government of India for the first time unfolded guideline on telemedicine amidst COVID-19 with audio-video aids and messaging as three wide methods of correspondence for consultation for providing timely and best possible care.¹²
- This study shows during COVID-19 most widely recognized e-Health services are e-Consultation (31.9%), e-Prescription (19.1%), As per Redseer Analysis e-Consultation are being acknowledged all the more unequivocally in COVID-19 period⁹. And Before COVID-19 most well adopted e-Health services were follow up (42%) and diagnostics (28%).¹⁰
- Practo found that 44% of the tele-consultations were from non-metro cities.¹³
- The present study showed lack of technology knowledge, infrastructure, which are the most common challenges faced towards adoption of e-Health. Similar result was shown by study conducted in Nigeria in 2018.¹⁴
- There is less awareness regarding smoking and Breast care e-Health App is seen in respondents of our study. which is in contrast as various smart phones intervention apps, games have been developed in India for the cessation of smoking¹⁵ and Breast Care Management.¹⁶

RECOMMENDATION

- In future a study needs to be done to evaluate the e-Health tool use among Doctors post COVID-19.
- Obligatory telemedicine courses in the medical understudy and mandatory classes for clinical professionals and technical staff of Jodhpur on e-Health sensitization.
- A future study should be further attempted to explore the perspectives of doctors who are not using e-Health tool in their clinical practice and what would further motivate them to use.

CONCLUSION

STRENGTH: As per knowledge no previous study is done on e-Health app use among doctors before and during COVID-19 in Jodhpur

LIMITATION: this study has some limitations that it was approached to those doctors only who were in contact list of the author and this study is restricted geographically.

Contd..

COVID- 19 pandemics is causing deaths in thousands and in millions, with enormous number of hospitalizations, social aggravation, and immense money related adversities around the world. Telehealth innovation and its utilization are not new, but before COVID-19 adoption of e-health platforms was limited to mobile phone for correspondence between health professional and patients. The first six months of 2020 end up where digital health bolster the public health system with increase in patient treated and frequency of eHealth App use along with rise in video conferencing user modality is seen in this study. A favorable attitude is seen among doctors towards the use of e-health in pandemic. While this study shows significant association between knowledge level and attitude on e-Health use before and during COVID-19 also no relationship was observed between working sector of health professionals on knowledge and attitude towards e-Health. It is also observed that during Pandemic, e-Health is overcoming the gap between individuals, doctors and health system, therefore allowing everybody, particularly suggestive patients, to remain at home and communicate with doctors through virtual channel, assisting with decreasing the physical visits. e-Health holds exceptional assurance in moderating the impact of a pandemic and further preventing nosocomial infections.

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PART- II

REPORT ON ONLINE COURSE

e-Health more than just an electronic record

By The University of Sydney

COURSE DESCRIPTION

e-Health: More than just an electronic record is a Massive Open Online Course(**MOOC**)", is multidisciplinary in nature, and aims to equip the global audience of health clinicians, students, managers, administrators, and researchers to reflect on the overall impact of e-Health on the integration of care. It explores the breadth of technology application, current and emerging trends, and showcases both local and international eHealth practice and research.

The whole e-Health Course comprises of 5 modules, with graded assignments components in module 2 and module 5.

OBJECTIVE OF COURSE

- To Recognize an e-Health model which illustrates how key e-Health domain intersect to impact on fundamental principles of e-Health.
- To see the potential of mobile technology to support the shift from “healthcare” to “health”.
- To Describe a range of innovative e-Health interactions between consumers and healthcare professional

COURSE CONTENTS

Week 1- module 1- What is e-Health

Week 2-Module 2 Health in our Hands

Week 3- module 3 – Data and the "Quantified Self"

Week 4- Module 4- health professionals interactions

Week 5- Module 5 - e-health in Professional Practice

LEARNING METHODOLOGY

Learning methodology include:

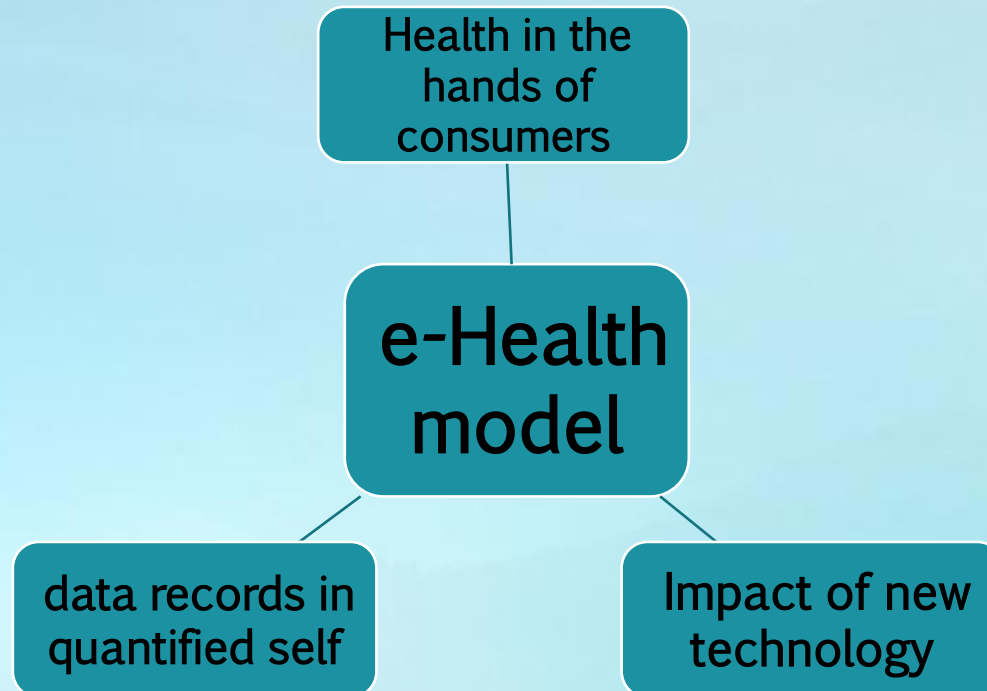
The methodology used for each module in this course is

- Documentary videos
- videos with case study examples
- Reading materials
- Practice Quiz
- Graded: Assignment 1 - Reviewing a health app
Assignment 2 - A Practice based e-Health case

KEY LEARNINGS - MODULE 1

- e-Health is an evolving in the juncture of medical informatics, public health stating to the health services and information distributed through the internet and associated technologies.
- One of the growing of e-Health is using technology to support communication between healthcare providers and consumers.

e-Health model which illustrates how key e-Health domains intersect to impact on health care



KEY LEARNINGS - MODULE 2

- Collecting Your Own data

M-App

- The use of apps, mobile devices, sensors, etc is commonly referred to as **m-Health**
- Various **Skype** or **video conferencing** services are really convenient via which health professionals are delivering their treatments to patients putting health and healthcare in hands.

Social Media for Health

- Google search
- Wikipedia
- Include #hashtags to get involve in conversation and one can access an entire world of support, guidance and information

Health information online

- Utilizing blogging and The use of digital games like (Diabetic Mario, Packy and Marlon) has been developing in fame in health services.

- **Designing and evaluating eHealth solutions**

One way of assessment is by **MARS rating scale** in view of Engagement, usefulness, design and quality of information, used for evaluating the nature of m-Health applications.

KEY LEARNINGS - MODULE 3

Current Trend of Electronic Health Records

- The utilization of health information has enormous ramifications for how health care is conveyed and how health is managed. Who holds our health data, who owns the data, who can use it, and for what purposes?
With increasing connectivity means the ability to share cases, information, and to improve the diagnosis for patients, so that no matter where the patient goes, their history follows them.
- Australian government manages this by **PLEHR** (personally controlled electronic health record) is now renamed as **My Health Record**, they represent the standard records of patients like discharge summary, list of medications, list of allergies, immunizations etc.

Privacy and Data security

- In healthcare data privacy and security are a major concern. From the patient perspective, it should be safely available whenever required or e-Health to really function at its best much data about each patient is needed. It's very different to keeping patient records in a database.so the data needs to be sent somewhere And the cloud is really something that's quite important to consider in this matter.
- **The Health Insurance Portability and Accountability Act (HIPAA)**, was enacted in 1996. And is designed to protect healthcare information security and confidentiality.

KEY LEARNINGS - MODULE 4

Improving access to healthcare

With e-Health framework, patients can plan their meeting with health professionals online specially outreach patients. It can spare time, cost and additional endeavours of patients in a compelling way

Electronic health information will give individuals clear and more knowledge about their health, according to their desire, they can even share their health related data with anybody in a couple of seconds. Doctors need to do less paper work.

e-Health system will help providers to improve quality, productivity, and work-life balance

Innovations in healthcare

In Sydney health professionals develop **Kids Help Line** tracking all the clients for preventing mental health depressions

My Physio app can view video demonstrations of each exercise, also a description of how to perform the exercise

Multi-modal app: App develop for the people who have aphasia

KEY LEARNINGS - MODULE 5

Shows the e-Health study examples and description of strategy for improving healthcare services and needs among the care givers and providers

- **Electronic record supporting remote care-** by easy access to the computer **GP** can easily find out all the care that has been given to that patient very basic information. How many times one has been in hospital? What was it for? What was the diagnosis of that admission?
- **“My home Dialysis”** is for renal patients who have dialysis machine at home to record the health data. The home screen which shows their last dialysis session. And this is where patient can actually start your new dialysis. also have a section for to list all medications and history, so all the treatments that have been share with doctors or caregiver is that can actually generate a report. Another advantage of an app like this is that as data is put in, it can do error checking for you and it would also send alerts if something is not rightly done before.

This way e-Health modules have introduced to the key concepts and domains of e-Health and guided us in considering how one might incorporate an e-Health strategy in own's professional practice.



Thank!
you!