# CAREX: Health, Care & You

# APPLICATION IN THE HEALTHCARE INDUSTRY

**Dr. Danie Kingsley*[1], Anamika Singh[2], Dikshita Kaul[3], Deekshitha J[4]**

*[1]Communicating author: Dr. Danie Kingsley**

*Assistant professor senior, department of integrative biology, SBST, VIT - 632014*
*[2] Anamika Singh, 2nd Year Student, Btech. Biotechnology, VIT Vellore*
*[3] Dikshita Kaul, 2nd Year Student, Btech. Biotechnology, VIT Vellore*
*[4] Deekshitha J, 2nd Year Student, Btech. Biotechnology, VIT Vellore*

---------------------------------------------------------------------***---------------------------------------------------------------------

**Abstract -** *The usage of mobile and web applications in the Healthcare sector has grown multi-fold from a garage idea to a billion-dollar business. In these tough times of the Coronavirus, Movement from homes to hospitals (Even) is highly restricted. This is very difficult to maneuver between for the elderly and pregnant women. In this review paper, we will be grazing over the importance, benefits and overall usage of mobile applications in the healthcare sector with respect to one application – CareX.*

*Key Words***: Covid-19, Hospital, Healthcare Application, Nurse Empowerment, Ventilators**

## 1.INTRODUCTION

Numerous parts of the medical care area have changed widely because of the remarkable development of cell phones/web gadgets. These gadgets have gotten themselves atypical in medical services settings, driving towards an all the more innovatively operational area. From that point forward various portable applications are built up each having some expertise in a specific team to help the Healthcare Professionals, for example, data and time the executives, wellbeing record upkeep and access correspondences and counselling; reference and data gathering; understanding administration and checking; clinical dynamic; and clinical schooling and preparing.

Portable applications are programming programs that have been created to fundamentally run on a PC/cell phone to achieve a particular reason! The quick incorporation of cell phones into clinical practice has, to a limited extent, been driven by the rising accessibility and nature of clinical programming applications, or "applications." They can play out the most intricate capacities or errands in a basic, quick, and productive way with the assistance of Faster processors, improved memory, more modest batteries, and profoundly effective open-source working frameworks.

Each application can be tuned in for a particular sector and be used for both personal and professional requirements!

The capacity to download clinical applications on cell phones has gained ground in the portable clinical assets accessible to HCPs. Clinical applications for some, objects are accessible, including ones for electronic recommending, conclusion and treatment, practice the board, coding and charging, and CME or e-learning.

The Coronavirus - SARS-COV 2 was first identified in December 2019, in Wuhan, China. It before long spread and more than 200 nations felt its quality very soon. With the number of cases testing positive hitting the outlines and the number of passing earning up the slant, with no clinical intercession accessible, Measures were before long acquainted with end or hinder the spread of the infection. These measures incorporate the advancement of respiratory and hand cleanliness, physical separating for everyone, isolates for the speculated cases, confinement and contact following of the contaminated people, and boundless travel restrictions.

In India, A nationwide lockdown was announced on March 24, 2020 entirely restricted the movement of people. With People losing their jobs, companies shutting down, hospitals filled with COVID patients, fear rippled through every citizen. With Laws becoming more stringent and travelling needing a bundle of paperwork it became extremely difficult for the elderly and pregnant women to reach across for medical help.

From requiring everyday vitamins, tracking their UT infection, scanning mild abdominal cramps or severe heartburns everything required additional medical assistance and this was becoming very difficult to achieve. The elderly faced a much larger issue from diabetic medication, pressure regulation, oxygen level fluctuations, cancer treatment, to Parkinson's care etc. From short needed nurse care for pregnant women to long standing assistive care for the elderly, every day was a major struggle to pull through the lockdown as it demanded strong paperwork approved by major officials.

80% of pregnant women and 90% of the elderly faced issues with getting medical help in the lockdown. 60% of pregnant women and elderly have the need to visit the hospital every week. CareX is a proposal to solve this immediate attention required issue.

CareX is a mobile and web application available in both android and IOS that not only helps the elderly and pregnant women to book medical assistants and nurses but also provides the healthcare professionals an alternative job.

## 2. METHODOLOGY

Surprisingly, Medicine The usage of mobile and web applications in the Healthcare sector has grown multi-fold from a garage idea to a billion-dollar business. In these tough times of the Coronavirus, Movement from homes to hospitals (Even) is highly restricted. This is very difficult to maneuver between for the elderly and pregnant women.

In this review paper, we will be grazing over the importance, benefits and overall usage of mobile applications in the healthcare sector with respect to one application – CareX.

## 2.1 Application and Healthcare

The rapid integration of mobile devices into clinical practice has been driven by the rising availability and quality of medical software applications, or "apps." As seen earlier, apps are software programs that have been developed to run on a computer or mobile device to accomplish a specific purpose. High speed processors, smaller batteries, and highly efficient open-source operating systems that perform complex functions have paved the way for the development of a many medical apps for both professional and personal use.

The goal of this study is to provide a deeper understanding of how users of healthcare apps interact with software developers, with the purpose of evaluating peculiar characteristics that would require the development process of healthcare apps to be different from the one of standard applications.

In the following subsections, we describe our research questions and the methodology adopted to address them.

## 2.2 Research Questions

Established norms and operational best practices were revisited. Simultaneously, new initiatives are helping provide both lifesaving care for those directly impacted and routine care for patients whose regularly scheduled visits with their providers have been interrupted. Our work is structured around three main audiences, where their responses were collected by conducting a survey.

The survey was conducted in the online mode where the form link generated was shared with the specific audience members. This survey was conducted right after we got a solid idea about what our company would be about and what all services we could sign up for and who all we could help with it.

Our audience for this app is anyone in need of medical help and support, but mainly our target audience are old people, pregnant women and nurses. The survey saw the participation of around Pregnant women + Elderly = 125 and Nurses = 62

## 2.2.a Old People

In the first place, we aim at investigating how the target audience, especially the old people interact with the application. To this aim, we analyze and classify what users suggest within user reviews and opinions.

Hence, the research question for elderly were:

1.    Did you experience any difficulty in getting medical help in this pandemic??
With 3/4th people saying yes, we conclude the fact that something has to be done to reduce their problems.

2.    How Often Do You Visit Hospitals?
With around more than 50 people saying once a month and 32 saying every week, one can only imagine the irregularities caused in the schedule due to COVID-19.

3.    If our app provides instant booking of medical assistance, would it be useful?
Again, our survey got a very positive response were majority clicked on yes

4.    Will you be comfortable if the medical assistant showed up with proper safety gear?
The only condition which people did not want to compromise on was their safety and thus they preferred the medical consultant in protective care.

## 2.2.b Pregnant Women

Looking at the questionnaire for the pregnant woman, they included questions like

1.    What are the major troubles faced?
          The answers varied for different women but the top answers include:

- •    Irregularities in check-up
- •    Prenatal care
- •    Postnatal care
- •    Vitamin shots
- •    UTI infections; Tests very difficult
- •    Abdominal pains; scans required

2.    Will you be comfortable if the medical assistant showed up with proper safety gear?
With 0% no's and around 85% yes, and remaining maybe's it is established that the pregnant woman is experiencing a more difficult time as compared to other groups of people.

## 2.2.c Nurses

The pandemic is having a huge toll on our economy and it is seen in almost all professions with extra work from home hours and no salary for months.

Thus, keeping that in mind, our application is aiming to empower the nurses by providing them with a part time or free time work substitute.

The survey questions shared with the nurses included following questions

1.    Are you facing salary issues in your current hospital duty due to the pandemic?
67.8 % for yes proves the point on its own.

2.    Would you be interested in a side job like provided by our app?
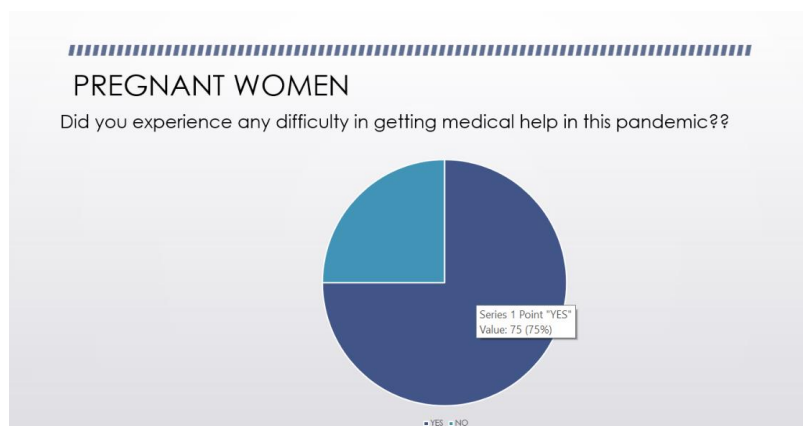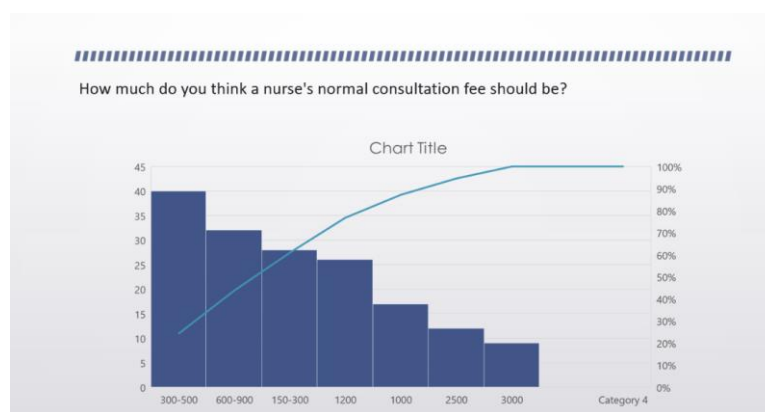The responses did not disappoint the CareX team and we understood the actual needs of people through this survey.

A total of 80% women were convinced if their pay per visit was proper.
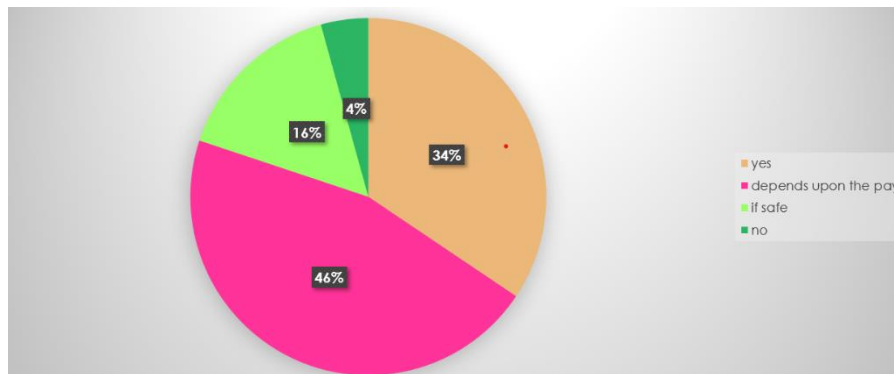
## 2.3 Figures

Few more readings from the people which helped us decide the fee structure and introduce further development in our application



How much do you think a nurse's normal consultation fee should be?



PREGNANT WOMEN

Did you experience any difficulty in getting medical help in this pandemic??

## 2.4 Application Development

After the survey it was easy to conclude that an app which can prove to be helpful as well as empowering would be welcomed by the people. Our prototype was decided and things like "nurses on call", "book an appointment", and "number of beds" were added. The app would show the information of beds only of those hospitals which were already registered with us.

The technical team meticulously designed the app in such a way that there were options included of different languages and big symbols or pictures after every tab. So that the people could easily figure the app out.

A total of 64 hours and our first prototype was ready. It took us 5 days to create the CareX version 1.0 and the discussion of version 2.0 was already ongoing. In version 2.0, we will be adding the number of ventilators, doctor on call, tie ups with pharmacies and more hospitals. Also tie ups with lab testing centers and nursing agencies to fulfil our need of resources.

These necessary services will not only provide a safer environment for people in need of hospicare but also not pressurize hospitals which are already struggling with the multifold increase in the COVID-19 cases.

## 2.5 Communication

A proper communication with the proper delivery of the services, between the patient and providing them with nurses is our main objective. Confirming the timings and necessities of the patient will be discussed beforehand. No long working hours for our nurses will be strictly followed. We also will have a ready call center so that patients can call anytime. In the name of hope, goodwill and good health, this nation deserves some relief in the healthcare sector during such challenging times and CareX can be the stepping stone!

## 3. RESULTS

The results in the form of a survey were collected. With a nod towards a green flag to our app, our app is ready for the market. With a team highly dedicated to running things smoothly, we are willing to make every step easier and faster.

A working customer care, achievable goals and hard work, CareX awaits its entry in the market to start helping people as soon as possible.

## 4. DISCUSSION

With the cell phone getting progressively flexible in various fields of work, there is extraordinary guarantee for its part later on for customized medication. In the current review of the accessible applications in the biggest applications. While, there are numerous applications inside the different clinical claims to fame that may exist, they were not secured as center is given to zones like extraordinary consideration at home and checking the accessibility and so on. While numerous versatile clinical applications have been accessible for quite a long time and are extremely mainstream, there is as yet an absence of information that helps or distinguish the best way to deal with their utilization. Clearly, certain degrees of specialized adroitness and acknowledgment from the clients (both patient and clinicians) are fundamental for the ideal advantages of utilizing this application.

The applications studied in this survey center around the numerous clinical angles with the ultimate objective of improving the productivity, cost, effortlessness and viability of healthcare. While, a swarm of applications exist, the lion's share discovered in Google and Apple application stores are either glossaries of clinical data applications for wellbeing experts, or fundamental wellbeing information applications for the layman. Indeed, even among the various applications intended for clinical information the executives and checking wellbeing, just a minority were discovered to be of direct viable use. Nonetheless, in social orders with less rigid clinical guideline and where particular clinical hardware may not be promptly accessible, the cell phone absolutely has a job as a patient partner, yet in addition as a screening device for medical conditions. The cell phone has just appeared to help in various territories: tolerant observing, transmission of clinical information among patients and clinicians, empowering persistent consistency, and assisting with clinical figurines and dynamics. Certainly, the patient now has the resources to take better ownership of their own health with such apps (regulatory board approved or not) at their disposal. As better health outcomes become the ultimate goal of the healthcare system, apps will be needed to fulfil that purpose.

## 5. DISADVANTAGES

1. The application needs proper connectivity at least till the patient gets the call centre number.
2. Also, our app won't be giving appointments for surgeries and operations that come under hospital help and need a proper setup always.
3. Some may not have Access to phones, no internet connectivity, difficulty in the transportation of nurses.

Our app is working on forming connections with cab services to give transportation to the nurses who find it difficult to find it on their own.

## 6. CONCLUSION

The coronavirus pandemic was disruptive throughout the world! It disturbed the functioning of the entire world and caused a lot of difficulties to the medically dependent elderly and pregnant women! Lakhs of people in India are facing trouble during this nationwide lockdown as the accessibility of hospitals reduced multifolds! From Basic vitamin shots to complicated cancer treatment, everything is in jeopardy due to the same!

CareX, the mobile application is aiming to solve the issue by allowing the general public from all economic strata to book medical assistants and nurses for any small to medium issues that can be well handled with the help of professionals at home without having any exposure to hospitals and the risk of the virus! With no internal charges as well as having various other features like the number of beds, doctors on call and pharmacies connected, an app like this doesn't just cater to the want of people but the very need of the hour, this pandemic. Medical treatment is for one and all and all sorts of medical emergencies take precedence! Thus, this app is our one step to make everyone's lives better.

## REFERENCES

[1]   https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4029126/

[2]   https://www.ijmr.org.in/article.asp?issn=0971-5916;year=2020;volume=151;issue=5;spage=468;epage=473;aulast=Bassi

[3]   https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4029126/

a.   An overview of clinically and healthcare related apps in Google and Apple app stores: connecting patients, drugs, and clinicians Samuel Ken-En Gan, Cornelius Koshy, Phi-Vu Nguyen, Yu-Xuan Haw December 2016

b.   Healthcare Android apps: a tale of the customers' perspective Mariaclaudia Nicolai, Luca Pascarella, Fabio Palomba, Alberto Bacchelli August 2019

c.   Mobile Medical Apps Changing Healthcare Technology Jeff Kabachinski November 2015

[4]   Evaluating and selecting mobile health apps: strategies for healthcare providers and healthcare organizations

a.   Edwin D Boudreaux, PhD, Molly E Waring, PhD, Rashelle B Hayes, PhD, Rajani S, Sadasivam, PhD, Sean Mullen, PhD, Sherry Pagoto, PhD September 2014

[5]   Medical apps for smartphones: lack of evidence undermines quality and safety

a.   Arthur willium jered buijunk and benjemin jelle visser and Louise marshall

b.   Colorectal smartphone apps: opportunities and risks S. O'Neill , R. R. W. Brady May 2012

[6]   Metrics for assessing blockchain-based healthcare decentralized apps

a.   Peng Zhang ; Michael A. Walker ; Jules White ; Douglas C. Schmidt ; Gunther Lenz2019

[7]   Applying Software Patterns to Address Interoperability in Blockchain-based Healthcare Apps

a.   Peng Zhang, Jules White, Douglas C. Schmidt, Gunther Lenz 2019

[8]   An overview of mobile applications (apps) to support the coronavirus disease 2019 response in India

a.   Abhinav Bassi, Sumaiya Arfin, Oommen John, Vivekanand Jha December 2019

b.   Mobile Devices and Apps for Healthcare Professionals: Uses and Benefits C. Lee Ventola, MS

c.   Unified Communications in Healthcare Jeff Kabachinski

[9]   Healthcare providers: preparing for the next normal after COVID-19

a.   Axel Baur; Panco Georgiev, MD; Imraan Rashid Munshi, MD; and Marek Stepniak May 2020

b.   A Systematic Review of Healthcare Applications for Smartphones Abu Saleh Mohammad Mosa, July 2012

[10]  Driving Innovation in Health Systems through an Apps-Based Information Economy

a.   Kenneth D.Mandl123Joshua C.Mandel12Isaac S.Kohane3 June 2015

b.   Apps as Artefacts: Towards a Critical Perspective on Mobile Health and Medical Apps Deborah Lupton September 2014

c.   A Generic Process to Identify Vulnerabilities and Design Weaknesses in iOS Healthcare Apps Christian D'Orazio ; Kim-Kwang Raymond Choo 2015

d. Stroke and technology: prescribing mHealth apps for healthcare providers, patients and caregivers – a brief, selected review Jonathan Singer & Steven R Levine April 2016

[11] How smartphones are changing the face of mobile and participatory healthcare: an overview, with example from eCAALYX

a. Maged N Kamel Boulos, Steve Wheeler, Carlos Tavares & Ray Jones 2011

b. A Taxonomy of mHealth Apps -- Security and Privacy Concerns  Miloslava Plachkinova ; Steven Andrés ; Samir Chatterjee 2015

c. A development framework for mobile healthcare monitoring apps Pilar Mata, Austin Chamney, Gary Viner, Douglas Archibald & Liam Peyton June 2015

d. Smartphone apps in mental healthcare: the state of the art and potential developments Melvyn W. B. Zhang, Cyrus S. H. Ho, Christopher C. S. Cheok and Roger C. M. Ho September 2015

[12] Design of Blockchain-Based Apps Using Familiar Software Patterns to Address Interoperability Challenges in Healthcare

a. Peng Zhang, Vanderbilt University, Nashville, TN

[13] Personalized assistant apps in healthcare: a Systematic Review

a. Mersini Paschou ; Evangelos Sakkopoulo

[14] Exploring the adoption of telemedicine and virtual software for care of outpatients during and after COVID-19 pandemic - https://link.springer.com/article/10.1007/s11845-020-02299-z

[15] Collateral damage of COVID-19 pandemic: Delayed medical care - https://onlinelibrary.wiley.com/doi/full/10.1111/jocs.14638

[16] Inter- nation social lockdown versus medical care against COVID-19, a mild environmental insight with special reference to India - https://www.sciencedirect.com/science/article/pii/S0048969720324311

[17] Applications of e-Health to Support Person-Centered Health Care at the Time of COVID-19 Pandemic - https://www.liebertpub.com/doi/full/10.1089/tmj.2020.0201

[18] Patient care protocols and personal safety measures for health care professionals in cardiac catheterization rooms during the COVID-19 outbreak in the National Institute of Cardiology - https://onlinelibrary.wiley.com/doi/full/10.1002/ccd.28979

[19] Covid-19 — Implications for the Health Care System - https://www.nejm.org/doi/full/10.1056/nejmsb2021088

a. David Blumenthal, M.D., M.P.P., Elizabeth J. Fowler, Ph.D., J.D., Melinda Abrams, M.S., Sara R. Collins, Ph.D.

[20] https://jamanetwork.com/channels/health-forum/fullarticle/2765238

[21] https://clemson.libguides.com/healthtopics/covid19?fbclid=IwAR2mXKqdtDsXVJk7xZO7OjsOd8EhhzRucFy-xPn_8PF-cyhUCUhWqcyF1_c

[22] https://www.livemint.com/politics/policy/will-covid-19-prompt-health-reboot-11585497828527.html

[23] https://www.elsevier.com/connect/coronavirus-information-center

[24] Healthcare Transformation in the Post-Coronavirus Pandemic Era

a. Abdul Rahman Jazieh and Zisis Kozlakidis2

https://www.frontiersin.org/articles/10.3389/fmed.2020.00429/full?&utm_source=Email_to_authors_&utm_medium=Email&utm_content=T1_11.5e1_author&utm_campaign=Email_publication&field=&journalName=Frontiers_in_Medicine&id=560676

[25] Risk of COVID-19 among front-line health-care workers and the general community: a prospective cohort study

a. Long H Nguyen, MD, David A Drew, PhD, Mark S Graham, PhD, Amit D Joshi, PhD, Chuan-Guo Guo, MS, Wenjie Ma, ScD

b. https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(20)30164-X/fulltext