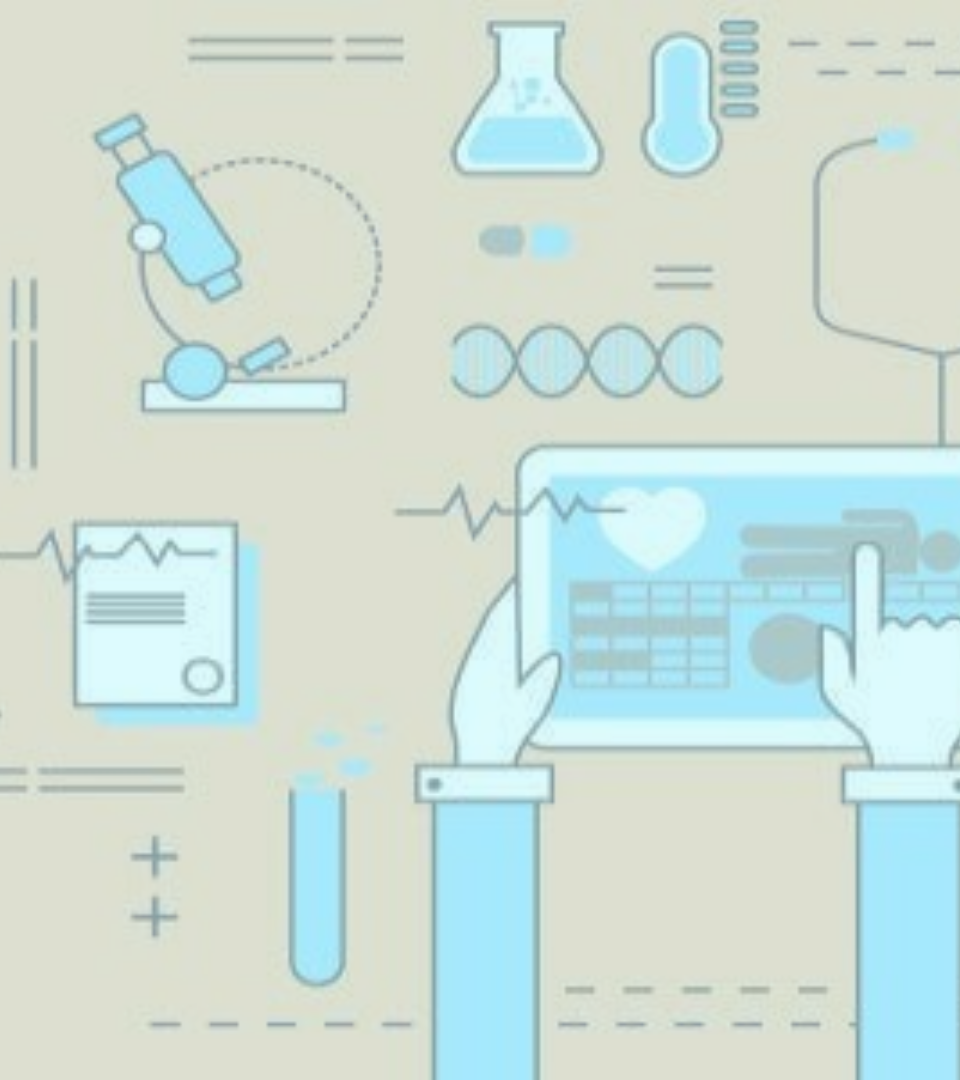


A stylized illustration on a light beige background featuring various medical and scientific symbols. At the top left is a blue microscope. To its right are a blue Erlenmeyer flask with liquid, a blue thermometer, and a blue pill. Below the microscope is a blue DNA double helix. To the left of the DNA is a blue stethoscope. In the center, a pair of hands in white gloves holds a blue tablet displaying a heart icon, a grid, and a person silhouette. To the left of the tablet is a blue document with a heart rate line. At the bottom left is a blue test tube. The background is decorated with dashed lines, plus signs, and equals signs.

PART 1: IMPLEMENTATION OF BIG DATA IN PUBLIC HEALTH, TELEMEDICINE AND HEALTH INFORMATICS IN A POST COVID-19 WORLD

A SYSTEMATIC REVIEW

SUBMITTED BY
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2019-2021

BACKGROUND

The aim of this Systematic review of literature is to answer the research question:

“How Big Data analytics is implemented in healthcare environment to enhance care delivery with applications in public health, telemedicine and health informatics in a COVID-19 world?”

This review also describes the challenges posed in leveraging Big Data analytics in healthcare and the need for approaches to defeat them.

Big Data Analytics has immense potential in improving the quality of care, cost effectiveness, and efficiency of health systems particularly in the post Covid-19 world. Big Data is thus, proving to be an asset in helping estimate and comprehend the range and effect of coronavirus. It is being utilized by healthcare professionals, researchers, epidemiologists, and policymakers to deploy healthcare resources rapidly on a local and worldwide scale.

However, there are only a few literature reviews available regarding big data in healthcare industry in dealing with the pandemic COVID-19, which remain largely fragmented. Thus this study provides a comprehensive understanding on the global healthcare emergency and the use of Big Data Analytics in assisting healthcare organizations, hospitals, pharmaceutical companies and insurance companies to come up with the necessary solutions to benefit the common man by providing better diagnosis and quality of care, ensuring cost effectiveness, maintaining health records, post treatment monitoring and improving each accessible asset.



OBJECTIVES



To determine how Big Data is helping in the fight against COVID-19 by incorporating contemporary analytical technologies



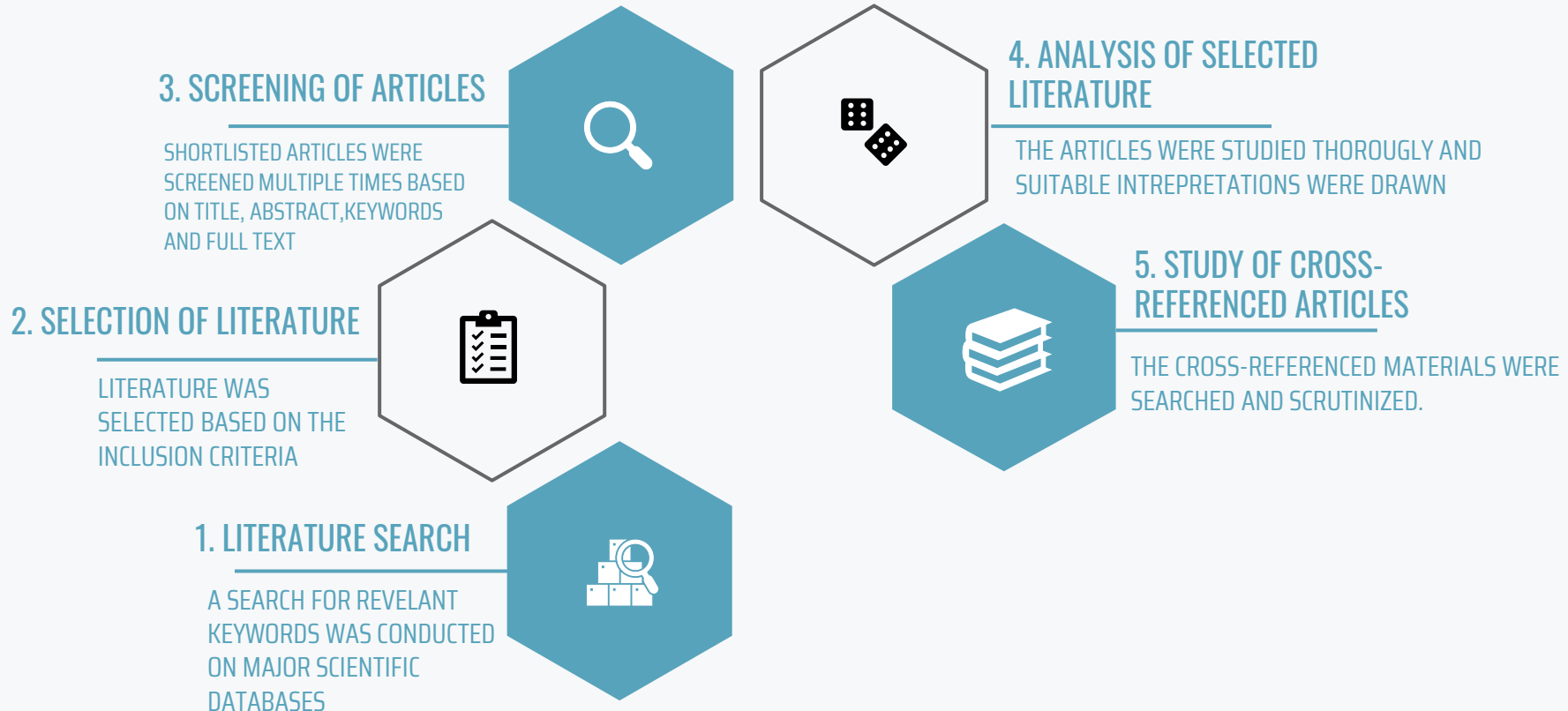
To illustrate the applications of Big Data in handling COVID-19 in the disciplines:

1. Public Health
2. Telemedicine
3. Health informatics



To identify the challenges posed in Big Data implementation in Healthcare and strategies to overcome them.

METHODOLOGY



RESULTS AND DISCUSSION

A total of 50 articles were selected in the review according to the inclusion criteria. The secondary data extracted includes material on the Role of Big Data analytics in a post COVID-19 world; sources and techniques of Big Data in healthcare; applications of big data in public health, telemedicine and health informatics; implications and relevant strategies to overcome them. The secondary data was comprehensive and replicable. The major findings of this study are:

1. HOW BIG DATA IS HELPING IN THE FIGHT AGAINST COVID-19

As a result of the pandemic, unprecedented amount of data is being generated. With the merger of Big Data, AI and Internet of things, it is possible to manage this enormity of information effectively.



It has been found out that major sources of big data are: social media searches, personal monitoring equipment-GPS records and mobile health applications, etc. By utilizing the non-conventional data sets, effective healthcare measures can be designed and implemented. Many such examples have been included in this study wherein, these data sets are leveraged by researchers as well as healthcare and IT companies to predict the number of Coronavirus cases, health resources utilization, predict the growth of pandemic curve and the peak of the infection. Airline ticketing data has also been used to determine the geographical spread of the disease

2. APPLICATIONS OF BIG DATA IN HANDLING COVID-19

Big Data In Public Health

Big Data can be used as a powerful tool in storing and analysing the large datasets and identifying trends, predicting patterns, associations and differences that can help in the detection and recovery of COVID-19 patients. Big data analytics is being utilized in recording the symptoms of Covid-19 patients, travel history, migration, availability of resources and most importantly in drug and vaccine discovery. This section of the study includes the real-time examples of pharmaceutical and biotechnology companies using big data analytics in vaccine development for COVID-19.

Big Data In Telemedicine

In the current scenario of COVID-19 outbreak, healthcare professionals are regularly getting infected by the disease which decreases patient-doctor ratio thus, telemedicine and telenursing is helping in the fight against COVID-19. This segment powered by Big Data analytics is completely transforming healthcare. It is doing so by using cloud services, helping in remote monitoring and medication, predictive analysis, delivering precision medicine, reducing risk during Covid-19 and using drone applications in the time of disasters and pandemic.



Big Data In Health Informatics

Data Mining techniques and Big data in health informatics aims to focus on the ultimate goal of providing improved Health Care Output (HCO). The role of biomedical big data, AI and advanced informatics play an important role in managing a disease outbreak by maintaining Electronic Health Records for patient management, emergency care, tracking of cases, patient satisfaction and establishing communication with patients.

3. CHALLENGES OF BIG DATA IMPLEMENTATION IN HEALTHCARE WITH RELEVANT STRATEGIES TO OVERCOME THEM

Big Data analytics pose serious challenges in incorporating it's tools and techniques in healthcare organizations. These challenges include: Data capturing, storage, security and privacy, cleaning, unified format, querying, image processing, meta-data, visualization, data sharing and ethical and legal. Some strategies to overcome these challenges are covered in this study.



CONCLUSION AND FUTURE PROSPECTS

Through this systematic review, it can be presented that Big Data is playing an important role in the fight against COVID-19. It has emerged as a new frontier for the enhancement of Healthcare delivery around the world. A shift from experience based medicine to evidence based medicine can be observed by the implementation of Big Data technologies in healthcare. It is only possible due to the pattern recognition and predictive nature of Big Data. A clear, but slow transition of the health care sector can be seen from a wider volume based healthcare to precision healthcare. It is imperative to say that Big data is bringing about this transition but it's full potential is only limited to developed countries.

It is essential for the healthcare and IT professionals to collaborate and understand the working of Big Data Analytics to bring out a wide technological evolution in health sector. In the coming years, big data analytics can focus towards developing a predictive system in healthcare. This would impart futuristic prediction of outcomes, which would help in the prediction of disease outbreaks or future epidemic/pandemic in advance and assist in the development of targeted drugs or vaccines and initiate early interventions. The implementation of big data in handling of COVID-19 can pave the way for preventing future outbreaks by making data driven decisions for the future.



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PART 2:

ONLINE COURSE REPORT

Improving Global Health: Focusing
on Quality and Safety

OFFERED BY HARVARD
UNIVERSITY ON EDX

COURSE DESCRIPTION

 DURATION	8 weeks long
 TIME COMMITMENT	2-4 hours per week
 PACE	Self-paced
 SUBJECT	Health & Medicine
 COURSE LANGUAGE	English
 VIDEO TRANSCRIPT	English
 DIFFICULTY	Intermediate
 CREDIT	Audit for Free Add a Verified Certificate for \$99
 PLATFORM	edX
 TOPIC(S)	HEALTH HEALTHCARE

Achieving the highest standards of quality in healthcare is a universal problem, and all the healthcare professionals, doctors and nurses are facing issues in providing effective care. Thus, this online course was launched by Harvard Initiative on Global Health Quality (HIGHQ)- Improving Global Health: Focusing on Quality and Safety.

It is an eight-week course which comprised of eight modules focussing on different objectives. It serves the purpose of learning the measurement of quality and how it can be improved. This course offers a comprehensive and interactive curriculum.

OBJECTIVES



COURSE CONTENTS

BURDEN

- BURDEN AND HARM
- TUBERCULOSIS

MEASUREMENT

- QUALITY VARIATION
- GLOBAL METRICS

STANDARDS

- LEGAL SYSTEMS AND REGULATIONS

IMPROVEMENT

- QUALITY IMPROVEMENT
- CASE OF RWANDA

IT AND DATA

- HEALTH INFORMATION EXCHANGE

MANAGEMENT

- ROLE OF MANAGEMENT
- CASE OF INDIA

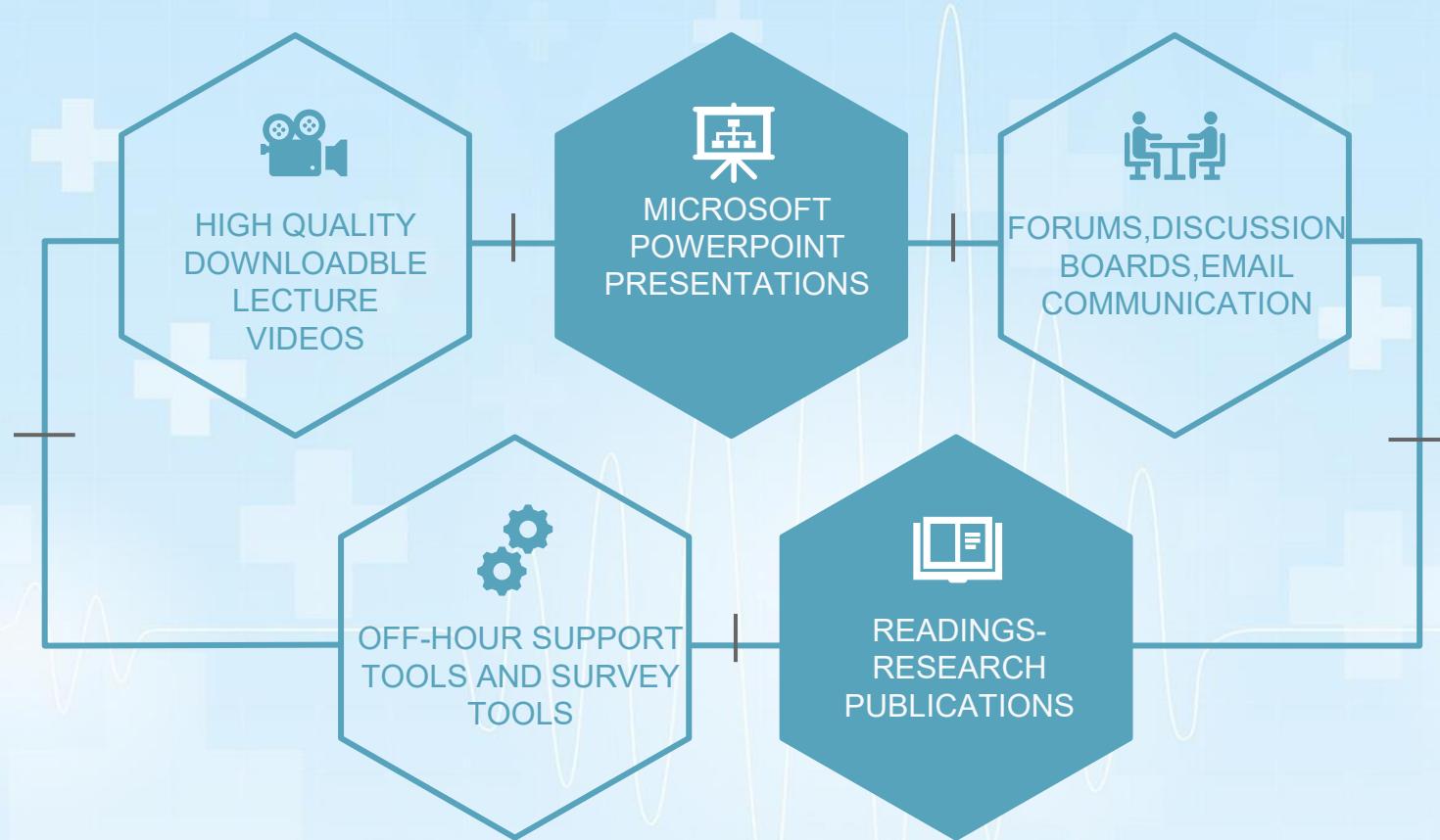
PATIENTS

- PATIENT CENTRED CARE
- MATERNAL AND NEW- BORN CARE
- NEW TECHNOLOGY

PUBLIC SYSTEMS

- QUALITY MOVEMENT
- NATIONAL STRATEGIES
- ROLE OF WHO

LEARNING METHODOLOGY



KEY LEARNINGS

QUALITY AND SAFETY IN HEALTHCARE

Improvement of healthcare quality by measuring and comparing the quality and safety in China and India. The quality is measured in terms of variation which includes, public-private variation and inconsistent allocation of resources.

Identified measurements of quality in ambulatory care.

The safety of the patients are compromised due to the lack of diligence of doctors and nursing staff. The commonly caused infections are usually preventable, still the patients are at a risk. To prevent these infections some points can be kept in mind like hygiene practices by doctors, adhering to the protocols and profiling people into risk categories.

TECHNOLOGICAL INNOVATIONS IN IMPROVING GLOBAL HEALTH

The use of data science in Health Information Exchange, how health data is stored and analysed globally.

The latest tools and technologies used for patient satisfaction such as online survey tools for feedback which includes rating of doctor and healthcare services. Effective management of data has a direct impact on quality care and patient safety.

PRACTICAL KNOWLEDGE BASED ON CASE STUDIES

A case study on Rwanda, East Africa was analysed to find out that Rwanda's health sector emerged glorious after being completely destroyed in 1994. As a country they achieved the Millennium Development Goals in healthcare, which included maternal health, newborn health and HIV/AIDS. The case of JIPMER, India, a leading establishment launched the Quality Council and its working strategy to ensure Quality. Case of India handling tuberculosis also provided practical based knowledge.

CONCLUSION

The online course Improving Global Health: Focussing on Safety and Quality was successfully enrolled and completed. As a management student, it helped to expand exposure to relevant knowledge and skills which focussed on improving healthcare delivery. This course provided the desired outcome in helping to understand the working of quality cells within organizations of different countries. It provided practical based case studies and examples for improving the quality and patient safety. The suggested reading material along with every lesson helped in gaining in-dept knowledge and cleared doubts simultaneously.

This course comprised of engaging and interactive lessons and was well aligned with the current health sector priorities to build capacity in improvement of quality and safety among healthcare professionals.

This course is freely accessible to everyone and does not require any pre-requisite which adds to the many other benefits.



THANK YOU

