



DISSERTATION PRESENTATION 2019-21

- ***Academic Mentor*** - DR. Deepti Sharma
- ***Submitted by*** - DR. Vidushi Bhardwaj

**A STUDY ON PERCEPTION OF HEALTHCARE PROFESSIONALS
ON IMPLEMENTATION OF DATA SCIENCE IN HEALTHCARE**



INTRODUCTION

- Data science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from structured and unstructured data and apply knowledge and actionable insights from data across a broad range of application domains.

Current Scenario in healthcare industry

- ✓ High cost to maintain healthcare data.
- ✓ Poorly managed healthcare data.
- ✓ Persistent problem of wrong diagnosis.
- ✓ Issues related to staffing.

Applications of Data Science in Healthcare

- *Imaging* - The fundamental and transcendent use of data science in the prosperity business is through clinical imaging. There are diverse imaging strategies like X-Ray, MRI, and CT examine. This heap of procedures envisions the inner bits of the human body. Generally, experts would truly examine these photos and find irregularities inside them. Regardless, it was ordinary difficult to find minute mishaps and accordingly, experts could not propose an authentic end. With the appearance of profound learning advances in information science, it is presently conceivable to discover such tiny distortions in the filtered pictures. Through picture division, it is feasible to look for deserts present in the filtered pictures.
- *Genomics* - is the investigation of sequencing and examination of genomes. A genome comprises of the DNA and every one of the qualities of the living beings. Prior to the accessibility of powerful computation, the associations invested a ton of energy and cash on examining the arrangement of qualities. This was a costly and dreary interaction. with the advanced data science tools, it is now possible to analyze and derive insights from the human gene in a much shorter period of time and in a much lower cost.

Applications of Data Science in Healthcare

- *Enhancing hospital operations* – Healthcare set ups are cost-touchy and deal with complex operational issues, like the number of staff to appoint at specific hours to amplify effectiveness, how to guarantee sufficient medical clinic beds are accessible to fulfil patient need, and how to improve usage in the working room. Prescient examination can enhance planning and surprisingly venture to such an extreme as to tell medical clinic staff which beds ought to be cleaned first and which patients may confront difficulties during the release interaction. EHR is one of the most widely used application of big data in healthcare which has made managing health records of patients and sharing them among doctors from different health institutes easy.
- *Patient Health Monitoring* – Various wearable devices that collect heartbeat, temperature and other parameters of users make use of IOT (Internet of things). The data collected using these devices is analysed using data science.

Key Benefits of Data Science application in healthcare

- Facilitate the work process of the medical services framework
- To lessen the danger of treatment disappointment
- To give appropriate treatment on schedule
- To keep away from pointless crisis because of the non-accessibility of specialists
- To lessen the holding up season of patients.

- **RATIONAL**

- Focusing on the core benefits of applying data science into healthcare, now is the right time for a data-driven healthcare industry for the benefit of both healthcare provider as well as healthcare seeker.
- This study aims to gain an insight about the level of knowledge among healthcare professionals (doctors) related to application of data science in healthcare.

- **RESEARCH QUESTION**

- What is the perception of healthcare professionals on application of data science in healthcare?

- **OBJECTIVE**

- ✓ To gain understanding about the view of doctors on implementation of data science in healthcare.
- ✓ Explore attitude of doctors towards adapting, a new AI based device that is, AI Prescription.
- ✓ Gain insight about current practices of use data science in healthcare amongst doctors.

- **METHODOLOGY**

This study is a descriptive study, that uses a cross-sectional study design to gain insight about the knowledge among healthcare professionals on application of Data Science in healthcare. The study was conducted using a questionnaire, made through google form, consisting of a set of 20 questions.

Sample Size

- The proposed sample size for this study was 150 healthcare workers (doctors). The total number of responses collected at the end of the study were 154.

Sampling Technique

- Simple random sampling technique was for the purpose of collecting the data.

Study population

- This study was conducted on doctors, working in various healthcare settings as well as private practitioners.

Data analysis procedure

- Data collected from the survey was analysed using Microsoft Excel.

❖ *Data collection tool*

Questionnaire consisted of a set of 20 questions including both close-ended and open-ended questions.

The questionnaire was generated in the form of google form and was circulated to the target population through various social media platform.

Questionnaire comprised of four major sections

- ❖ Section 1 – Demographic details.
- ❖ Section 2 - This section comprised of question based on the first objective of the study and helped gathering information about the knowledge of doctors on application of data science in healthcare.
- ❖ Section 3 - This section was developed keeping in mind the second objective of the study and had questions related to AI-Prescription.
- ❖ Section 4 - This section was developed to target the third objective of the study and thus to gain an idea about the current practices of data science applications in healthcare.

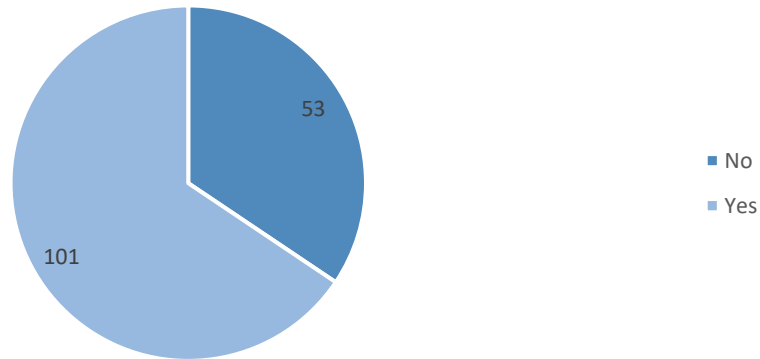
Google form was generated, and the link was shared to the target population through WhatsApp, and through professional groups on other social media platforms, owing to the current COVID scenario.



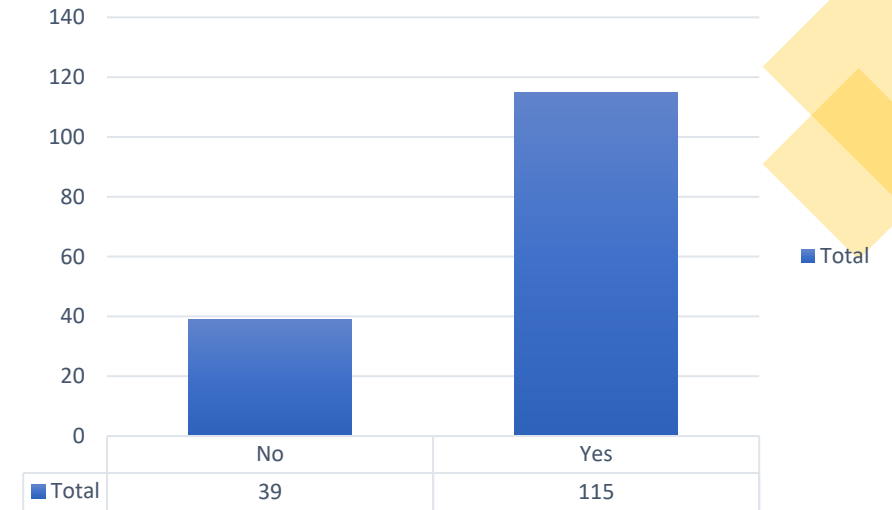
RESULTS & DISCUSSION

Objective 1 - To gain understanding about the view of doctors on implementation of data science in healthcare.

Do you know about Data Science

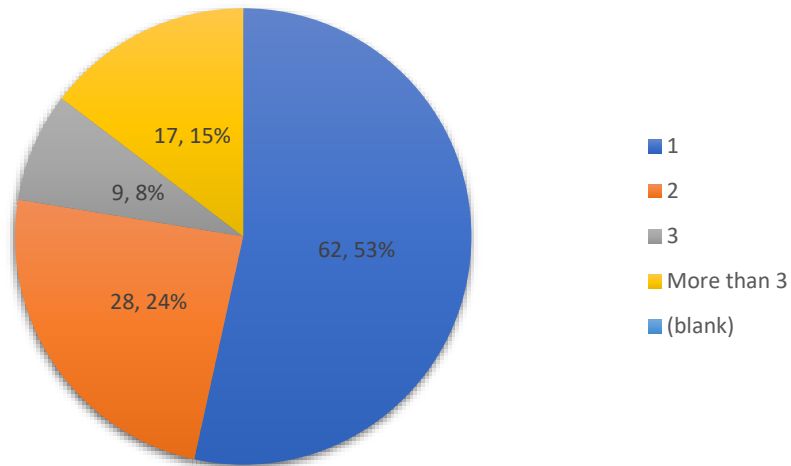


Can data science be applied in healthcare



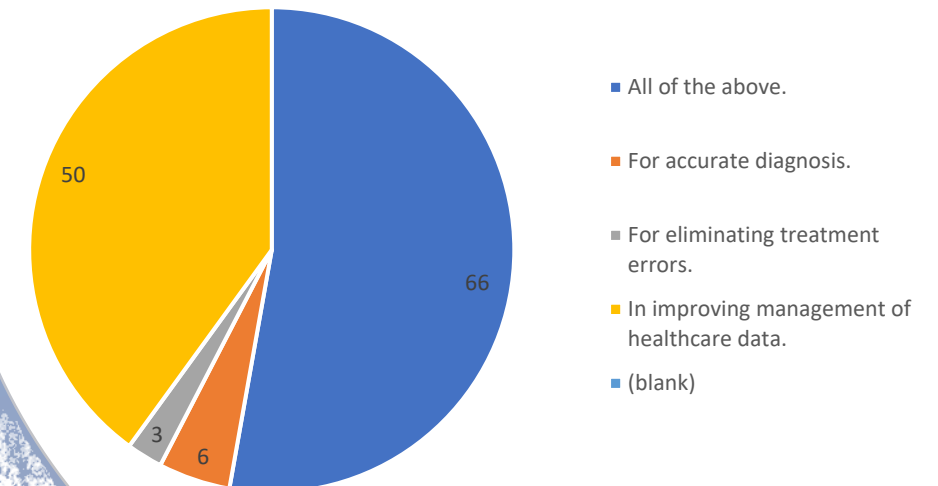
- Out of 154 respondents, 101 of the respondents are aware of data science & 53 respondents are not aware about data science. Thus, we can say that more than 50% of the doctors have an idea about data science.
- 115 respondents, believe that data science can be applied in healthcare. The inputs from the above charts clearly indicate, that majority of healthcare professionals are aware about data science application in healthcare sector.

Number applications known



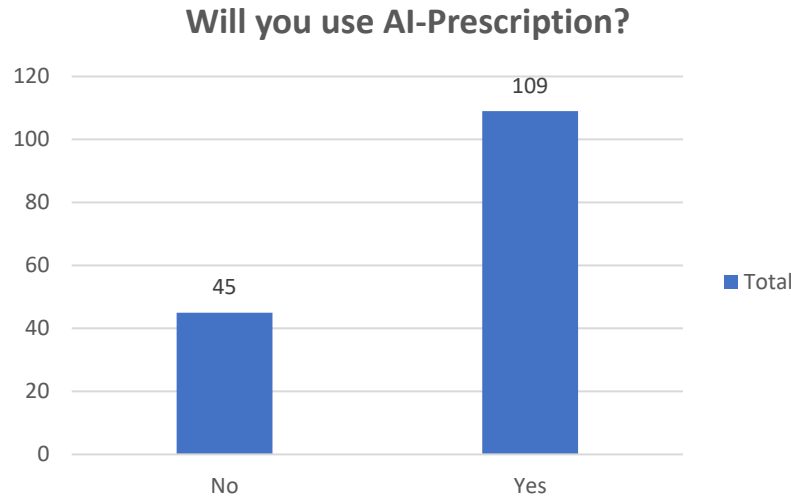
- **Majority of the respondents are aware of at least one, application of data science in healthcare.**

Domains where data science can be used in healthcare

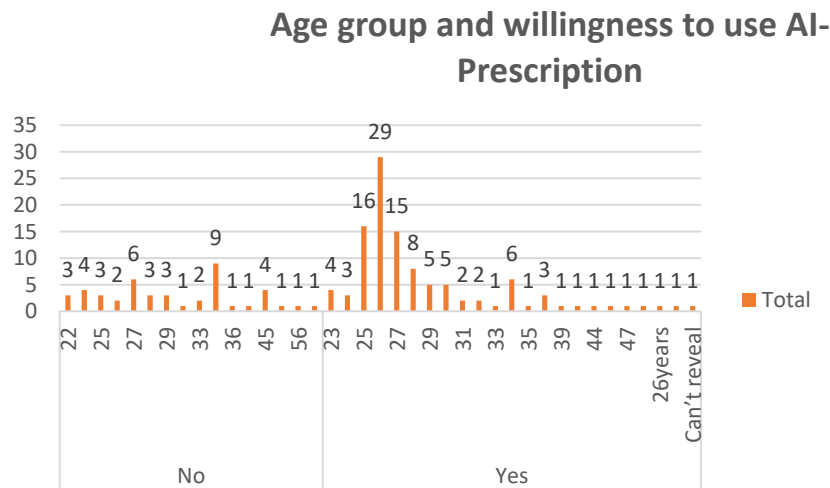


- **Majority doctors believe that data science can be used for diagnostic, for elimination of treatment errors as well as for managing healthcare data.**

Objective 2 - Explore attitude of doctors towards adapting, a new AI based device that is, AI Prescription.

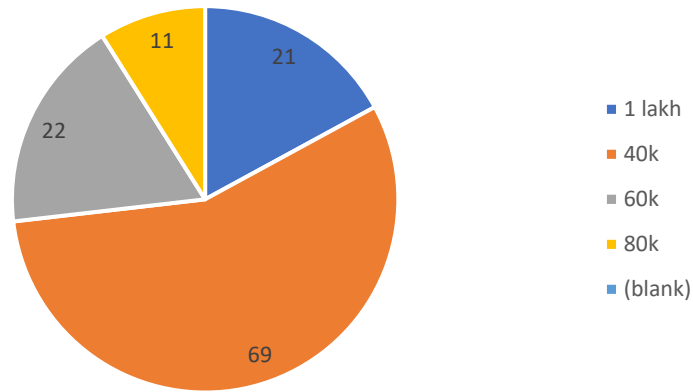


❖ Out of the total responses, 109 are willing to use AI- Prescription. This clearly indicates the need for such products in the market.



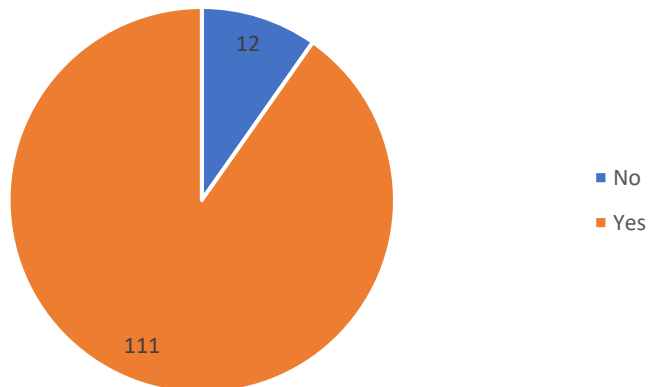
❖ High willing to adopt such technology is observed in 25 – 28 years of age group.

Price



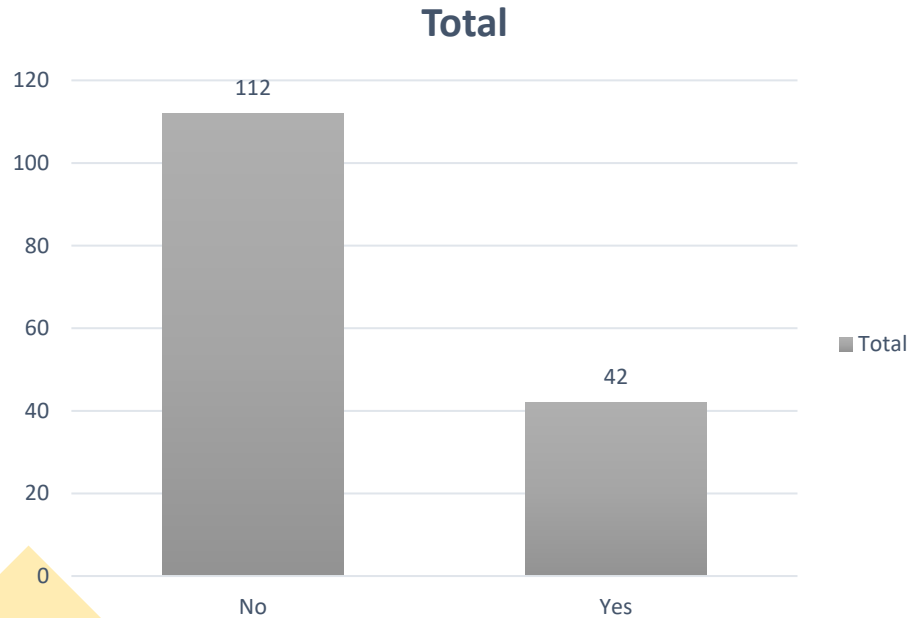
- ❖ A feasible cost for majority of respondents for such a product is around 40k. Which shows that while introducing any product like AI-Prescription in market a price range of between 40k to 60k can be considered.

Recommendation



- ❖ 111 respondents are willing to recommend this product to their colleagues.

Objective 3 - Gain insight about current practices of use data science in healthcare amongst doctors.



- Majority of doctors are not using any data science-based application in their day-to-day practice. This indicates lack of awareness on currently available data science applications.

Data science is majorly being used for the purpose of healthcare data management only. Developing more data science-based applications for patient monitoring or diagnostic purpose will prove beneficial.

CONCLUSION

Insights from the literature available on application of data science in healthcare, showcases prolific examples as to how data science is extending its roots to healthcare industry as well.

There is an utmost need to raise awareness about the current available data science applications in healthcare among healthcare professionals, so as increase the use of such application which would in turn aid in development of better application based on the feedback from healthcare professionals.

- ✓ *The study clearly shows that doctors hold fairly good knowledge about application of data science in health and they hold a positive attitude towards adopting such advancements in the field of healthcare.*
- ✓ *Targeting an age segment of 26 to 29 years, while launching any new data science application in healthcare industry will prove profitable, as the research clearly shows a positive attitude towards adaptability of such application among this age group.*

To conclude, I would say that data science is a promising field and can prove helpful in building data driven healthcare industry, thus working on some major issues in healthcare such a high healthcare cost, and poor healthcare quality.

REFERENCES

1. Dash S, Shakyawar SK, Sharma M, Kaushik S. Big data in healthcare: management, analysis and future prospects. *Journal of Big Data*. 2019 Dec;6(1):1-25.
2. Dalianis H, Henriksson A, Kvist M, Velupillai S, Weegar R. HEALTH BANK-A Workbench for Data Science Applications in Healthcare. *CAiSE Industry Track*. 2015 Jun 11;1381:1-8.
3. Sa S. Intelligent heart disease prediction system using data mining techniques. *International Journal of healthcare & biomedical Research*. 2013 Apr;1:94-101.
4. Hermon R, Williams PA. Big data in healthcare: What is it used for?.
5. Maity NG, Das S. Machine learning for improved diagnosis and prognosis in healthcare. In 2017 IEEE Aerospace Conference 2017 Mar 4 (pp. 1-9). IEEE.
6. Palaniappan S, Awang R. Intelligent heart disease prediction system using data mining techniques. In 2008 IEEE/ACS international conference on computer systems and applications 2008 Mar 31 (pp. 108-115). IEEE.
7. Pastorino R, De Vito C, Migliara G, Glocker K, Binenbaum I, Ricciardi W, Boccia S. Benefits and challenges of Big Data in healthcare: an overview of the European initiatives. *European journal of public health*. 2019 Oct 1;29(Supplement_3):23-7.



THANK YOU