

**KNOWLEDGE, ATTITUDE AND PERCEPTION ON THE
APPLICATION OF ARTIFICIAL INTELLIGENCE IN
DIAGNOSTIC SERVICES AMONG THE HEALTH CARE
WORKERS OF VARIOUS CITIES IN SOUTH INDIA**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of
Master of Business Administration (MBA)

in

Hospital and Health Management

by

Dibyaloson Rabha

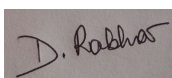
Under the Supervision and Guidance of

Dr. Sheenu Jain

Academic Year – 2019 - 2021

DECLARATION BY STUDENT

I hereby declare that this dissertation titled “Knowledge, Attitude and Perception On the Application of Artificial Intelligence In Diagnostic Services” 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.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 rectangular box containing a handwritten signature in black ink. The signature appears to be 'D. Rabha' written in a cursive style.

Dibyalsan Rabha

Date: 21 June 2021

CERTIFICATE

(Internship will finish by July 31st , therefore yet to get)

CERTIFICATE

This is to certify that dissertation title ***Knowledge, Attitude and Perception On the Application Of Artificial Intelligence In Diagnostic Services*** is a record of the research work undertaken by ***Dibyaloson Rabha*** 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 his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide
IIHMR University, Jaipur

Date

School Dean
IIHMR University, Jaipur

Date

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Abstract

The practice of medicine is getting much advanced. The health care professionals are less inclined towards the computer skills that could be helpful for their diagnosis. The artificial intelligence would pave the way for better decision making in the diagnostic field. There is a need for the medical community to get themselves trained in the field of Artificial Intelligence and Machine Learning techniques so that they could provide better inputs to the machine learning techniques and come up with improvised results in the field of diagnosis. There is still long way to go for the medical professions to accept Artificial Intelligence as a full-fledged diagnostic tool, although there has been a lot of advances in various fields. The hospitals are getting equipped with AI in the diagnostic departments. AI will be about assisting the clinicians in better decision making rather than replacing the human clinicians.

The hospitals that are old are more likely to get themselves equipped with AI in the diagnostic departments. Since, there is rapid advancement in various technological fields and in order to adapt in this rapidly changing environment they might go for time saving technologies. However, this study do not look at the aspect whether the number of years of the hospital has any relation with getting themselves equipped with AI.

Internet plays a very important role in acquiring knowledge of anything that we want. The medical professionals might be at least aware of the fact that Artificial Intelligence is used as a diagnostic tool, even if they might not have seen it or used it. They also would get the information from their colleagues, friends or from the colleges too. They also might know the fields in which AI is being used.

Machine Learning(ML), Deep Learning(DL), Convolutional Neural Networks(CNN) and various other techniques are being used to detect disease conditions. It can help in assisting the physicians in decision making by giving them accurate results of the diagnosis and also giving them the best possible treatment choice. A huge datasets are being used, trained and tested to get the desired results in diagnosing the diseases. The drawback of using AI is that the datasets are not sufficient to reach maximum level of accuracy since human body itself is a complex machine. It is not easy to create an algorithm that could cover all the aspects of diseases. The data collection of some rare diseases is difficult and this would result will not as accurate as it should be.

Apart from only diagnosing the diseases, AI can be applied in places where radiation is more. This could reduce the amount of getting exposed to radiation.

Lots of questions arises whether AI will reduce manpower or not? There is no direct answer for this question. Artificial Intelligence by itself cannot work. Although there are lots of tasks that can be taken up by AI, giving the human clinicians time to spend with the patients. It can reduce workload of the clinicians. It might not mean reduction in manpower rather it could be task-shifting. There are still lots of research works that need to be done in making AI to be able to diagnose diseases precisely. Even for the rare diseases.

It is never easy to accept something which is new. Although, AI has seen tremendous growth in other sectors, such as speech recognition and so on, but its application in health care is still under process to be accepted as a full-fledged diagnostic tool. It took decades even for stethoscope to be accepted by the medical community. Likewise, AI will also need time to be accepted fully.

Everything has its own pros and cons. AI will need regulatory standards. AI uses datasets which are supposed to be confidential. There are possibilities that these data might fall into the wrong hands and cause data breach. These confidential data might get misused by the people.

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Chapter 1: INTRODUCTION

In 1956, John McCarthy coined the term “Artificial Intelligence” for the first time, for a conference held at Dartmouth on the subject “ the science and engineering of making intelligent machines”. Artificial Intelligence because of its advanced computing power, learning algorithms, and datasets that are available from medical records, it is playing a crucial role in medicine and health care. A report by NITI Aayog stated that “AI will boost India’s annual growth rate by 1.3%.”

A newly introduced computer-aided endoscopic system was used to detect cancers in Showa University, Japan. The study results revealed sensitivity of 94%, specificity of 74%, and with 86% accuracy of potentially cancerous growths in the colon. Although a significant impact is seen in Deep Learning(DL) techniques in quantitative brain MRI, the biggest challenge lies in having that one single method to accept all variations in brain MR images from different institutions as well as from different MRI scanners. The deep learning methods are required to undergo various steps such as pre-processing of the data, initialization, and post-processing of the dataset. Besides, the training datasets are relatively small compared to large-scale ImageNet datasets to achieve generalizations across datasets.

When the stethoscope was first introduced, it took decades to accept the stethoscope as a diagnostic tool by the medical community. Likewise, it will take some time to accept AI (Artificial Intelligence) as a diagnostic tool. The author also stated that “Although some of their tasks will be taken over by AI, they will have more time for others for example deal with a patient with real care and patience.” Machine Learning techniques and Artificial Intelligence is going to be very helpful for radiologists as it is going to increase their value, efficiency, accuracy, and personal satisfaction. Bertalan Mesko, the Director of the Medical Futurist Institute, called the AI “the stethoscope of the 21st century”.

However, Indians’ perception towards AI is that it is less capable and have less knowledge in understanding the human feelings and requirements. The AI technology helps to address health challenges in India but is restricted by the nature of accessible medical information and the inability of human attributes for some aspects.

VentureBeat, listed out three AI applications that have the greatest value potential in healthcare: robot-assisted surgery whose estimated value is \$40 billion, the virtual nursing assistant whose estimated value is \$20billion, and administrative workflow assistance whose estimated value is \$18billion. The da Vinci technique made the physicians easier to perform the complex procedures as it is more flexible and easier to control unlike the conventional approach. “Heartlander”- a miniature mobile robot is designed to perform heart surgeries. It can reduce the unnecessary damage caused while accessing the heart by entering through an incision below the sternum. According to Syneos Health Communications, “64% of the patients responded that they would be comfortable with AI virtual nurse assistants.” Virtual nurses will eliminate unnecessary hospital visits while simultaneously easing the pressure on medical professionals.

Machine learning, natural language processing, reasoning, and perception are all examples of artificial intelligence. Artificial intelligence is utilised to approximate human intellect and analyse complex medical diagnostic imaging data.

The most common application of AI in health care is analysing the relationship between treatment techniques and patient outcomes. Besides, AI can also be used to detect tumors, detection of gait disorders and fall prediction, to detect diabetes or conducting speech analysis of emotional state and psychiatric disorders.

Even if AI is playing a great role in the diagnostic market, however, there are few challenges it is facing. They are:

- The machine learning methods used by the techies, have few datasets
- The data training sets require more and more images to improve the accuracy, sensitivity, and specificity.
- Different countries and different regions use different examination/diagnostic equipment.
- There is a lack of explanation capacity in diagnosing diseases in Machine Learning techniques.
- There is a gap in diagnosing of rare diseases.
- Financial issues
- The rural areas lack the infrastructure to set up the Artificial Intelligence system due to issues in internet, electricity, and so on.
- Training and professional issues.

NVIDIA Corporation, Intel Corporation, IBM, Google inc. Microsoft Corporation, Amazon web services, General vision, General electric healthcare, Siemens Healthineers, Medtronic Plc, Johnson and Johnson Services, and Koninklijke Philips N.V.(Netherlands) are the key market players in Artificial Intelligence.

The medical staffs get overburdened with their clinical as well as administrative work. Artificial Intelligence can help solve this issue. Some works can be done by the AI independently and help the medical staffs to spend time with the patients.

Chapter 2: REVIEW OF LITERATURE

Sl No	Title	Author	Year	Findings
1	“Artificial” or otherwise	Asa p. Ruskin	1986	The “Thinking” , machines are capable of only two responses to fire and not to fire unlike prototypical neuron. This is the building blocks of the thinking machines. This response can be made after summation of thousands of inputs. The ability of these robots to do "behaviour" allows them to perform incredibly complicated activities that may be on the same level in human terms as the creation of a termite colony.
2	“Artificial intelligence in radiology: decision support systems. Radiographics”	Kahn CE Jr.	1994	The future of AI depends on integration of previously collected radiologic studies. These studies need to be selected, analysed properly as these things share distinct elements of knowledge.
3	“Biological versus artificial intelligence: a critical approach”	W L Sanvito	1995	The authors mentioned that intelligence is purely a matter of physical symbol manipulation. The philosophers believed that computer-machines can follow rules which are like arithmetic or grammar but they cannot understand what these things would mean to them. They termed them as syntax and semantics..
4	“The coming of age of artificial intelligence in medicine”	Patel et al. (2009).	2009	The machine learning techniques will be the future in diagnostics since the future medicine is becoming more data-driven with the use of EMR(Electronic Medical Records).
5	“Artificial Intelligence and medical informatics”	Bruce Blam,	2009	The scope of artificial intelligence define a boundary. What is well understood by us is excluded and what is not understood is included.
6	“Large scale deep learning for computer aided detection of	Kooi et al.	2017	To detect breast cancer lesions, the authors compared a traditional state-of-the-art in mammography Computer Aided Detection (CAD) system based on a manually built feature

	mammographic lesions”			set with a DL Convolutional Neural Network (CNN) method. Around 45,000 photos were used in the system and the results showed that Convolutional Neural Network outperformed the standard Computer Aided Detection system.
7	“Artificial Intelligence is the Stethoscope of the 21 st Century”	Bertalen Mesko,	2017	The medical community will take time to accept AI in diagnosis as a “full fledge diagnostic tool”, like it took time to accept stethoscope.
8	“Big Data and Machine Learning-Strategies for Driving This Bus: A Summary of the 2016 Intersociety Summer Conference”	Krustkal et al.	2017	The emerging technologies would help the radiologists to improve the quality of care they provide to the patients..
9	“Deep Learning for Brain MRI Segmentation: State of the Art and Future Directions”	Akkus et el.	2017	A Deep Learning technique was used in quantitative brain MRI and it has given impressive results, but it is still not easy to design an algorithm that could cover all types of brain MRI images taken from different MRI scanners by different institutions.
10	“Artificial Intelligence: Threat or Boon to Radiologists?”	Recht and Bryan	2017	AI will become routine part of radiologist as the Machine Learning and Artificial Intelligence are getting more integrated towards the clinical practice. These techniques will be a boon to the radiologists as it can make their work more efficient and accurate.
11	“Machine Learning of Three-dimensional Right Ventricular Motion Enables outcome Prediction in Pulmonary Hypertension: A cardiac MR imaging Study”	Dawes et al.	2017	A machine learning approach was developed by the authors that allowed them to accurately predict the fate of individuals with pulmonary hypertension. A total of 250 patients' medical records were used in the research. The authors stated “the ML techniques improved survival prediction irrespective of conventional risk factors in patients with newly diagnosed pulmonary hypertension,”
12	“The 3 most valuable	Zaidi	2018	The author highlighted certain areas of the use of AI that looks promising, such as cognitive-

	applications of AI in health care”			assisted robotics that replaces large incisions with series of quarter inch incisions making it a minimally invasive surgery. These robots use miniature surgical instruments
13	“Will Doctors Fear Being Replaced by AI in the Hospital Settling?”	Raghav Bharadwaj	2018	Managing of huge amounts of administrative and clinical data is causing burnout among the physicians. The application of AI in this area can help solve the issue in this regard. One of the risk that has been identified is the poor data quality or “bad quality” that could lead to inaccurate clinical data.
14	“The future of radiology augmented with Artificial Intelligence: A strategy for success”	Liew (2018).	2018	AI and ML can provide support to the radiologists in decision making that can improve delivery of care to the patients. The Deep Learning algorithms can assist in identifying and classifying the disease patterns from images and helping the radiologists suggest suitable care pathways for the patient in consultations.
15	“Artificial Intelligence and Radiology: What will the future hold”	King Jr	2018	The future of radiology will not be new scanner coming to place but it will be in a way that AI utilising the imaging data already available from MRI, CT scan and PET scan. AI can do auto-segmentation of various structure within CT and MR images which will be helpful in analysing in a very short time period.
16	“Your future Doctor may not be human”	Abby Norman	2018	AI has its place in medicine but what is not known to us is its value. We should consider how the accuracies of AI and human are being checked? We should also consider how AI can contribute in medicine?
17	“Artificial Intelligence in retina”	Schmidt-Erfurth et al	2018	AI has previously been applied in medicine. An early form of AI, expert systems, attempted to codify physician choices into a set of rules that computers could follow. Considering the complex nature of medicine and the diversity of diseases, it was impossible to create an algorithm for all clinical circumstances.
18	“Artificial Intelligence as an emerging technology in the current care of neurological disorders.”	Urvish K Patel et al.	2019	“Apart from helping analyse medical data in disease prevention, diagnosis, patient monitoring and development of new protocols, it can also assist clinicians in dealing with voluminous data in a more accurate and efficient manner.”
19	“Insights into the growing popularity of	Dutt S et al.	2020	The risks and rewards associated with replacement of physicians by AI are as follows:

	artificial intelligence in ophthalmology”			Risks • Capability of AI to process larger amounts of data at a faster rate than human • Capability of AI to achieve a higher level of accuracy without burnout. Rewards • AI predictive models that are trained on large datasets are capable of predicting accurate patient outcome. • AI may reduce the administrative work of the physicians and help them to spend quality time with the patients and other clinical staffs. • AI will not be able to behave and do decision-making like a human and there will still be the need of human expertise to interpret data.
20	“Artificial Intelligence Solutions for Analysis of X-ray Images”	Scott J Adams,	2020	AI algorithms have been developed using large datasets to analyse radiographs which demonstrates accuracy equivalent to radiologists.
21	“Artificial Intelligence in oral and maxillofacial radiology: what is currently possible?”	Min-Suk Heo et al.,	2020	There is a need for huge datasets and OMF radiologists to make get accurate results which is a time-consuming tasks. In order to make AI in full practice a lot of problems need to be addressed. Building up of huge datasets is time-consuming task, understanding the judgements criteria of Artificial Intelligence is still not known by everyone and solve the hacking threats.
22	“Artificial Intelligence for anterior segment diseases: Emerging applications in ophthalmology”	Darren Shu Jeng et al.,	2020	There are many evidences available to demonstrate that Artificial Intelligence. Can be applied to diagnosis and manage various ophthalmic conditions related to anterior segments.

Chapter 3: METHODOLOGY

A total of 45 study participants from various cities of South India were selected. These participants belong to different locations of the state working in the same or different departments of the same or different hospitals. The study participants belong to three different specialties such as Radiology, Cardiology and Pathology. These specialties were chosen since they work in diagnostic departments. Snowball technique was used to collect the data, where a link containing semi-structured questionnaires of google-form were circulated through whatsapp among the participants within their group. The participants were instructed only to involve those who have work experience of more than 2 years. The questionnaire was designed after collecting various information about Artificial Intelligence. A pilot test was done to check the reliability of the questionnaire. The participants were contacted if they were able to answer the questions and able to understand the terms that were used in the questionnaire. The questionnaire was again circulated to them and after getting the response they were asked to circulate further among their group. The responses were checked from the previous responses if they look the same. The study is descriptive analytical cross-sectional study. MS Excel is used as a visualization tool and for analysis of the data. Three factors were considered to analyse the acceptance of application of AI in diagnostic services, which are:

- The knowledge on programming language- The respondents who knew programming language will know the proper application of AI.
- Application of AI in the hospitals in which they are working: These respondents might understand the benefits and drawbacks of AI much more as they are familiar with their usage.
- Knowledge on the use of AI in diagnostic services: It is very likely that the respondents who are working in the hospitals that use AI will have the knowledge about AI and will be able to analyse the drawbacks much better than mere knowledge on its application.

Research Question

Will the study participants accept AI as a full-fledged diagnostic tool?

Research Objectives

- To assess the awareness of AI in medical diagnosis
- To assess the attitude towards the application of AI in medical diagnosis

Chapter 4: RESULTS AND DISCUSSIONS

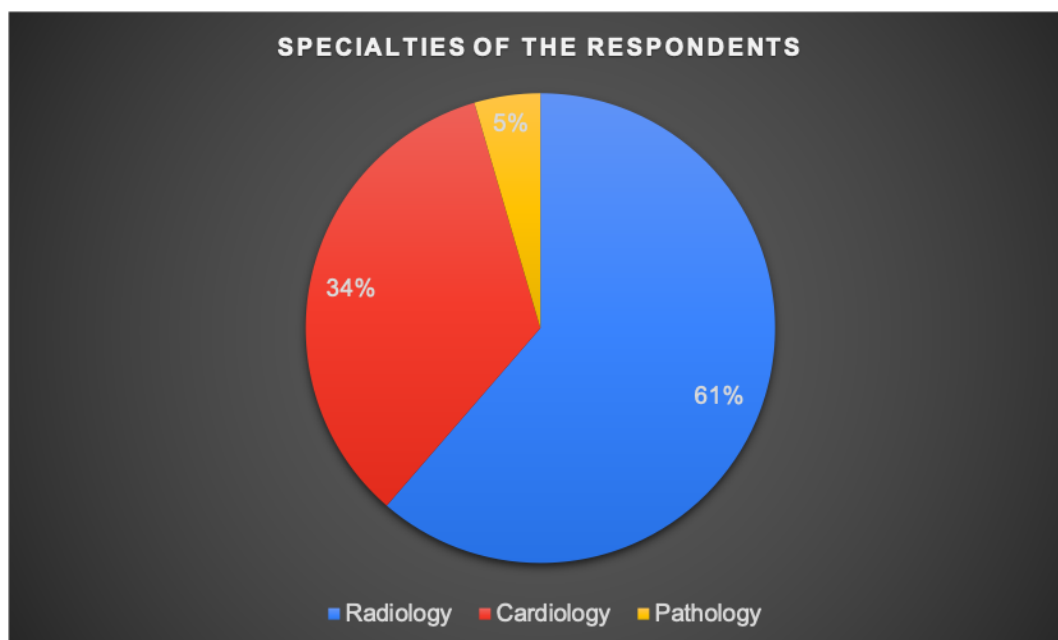


Figure no. 1

Total no. of respondents according to states

S. No.	State	Total
1	Karnataka	26
2	Kerala	6
3	Tamil Nadu	7
4	Andhra Pradesh	4
5	Telangana	2
Total		45

Note: *The states are counted manually by from the city names mentioned by the participants.*

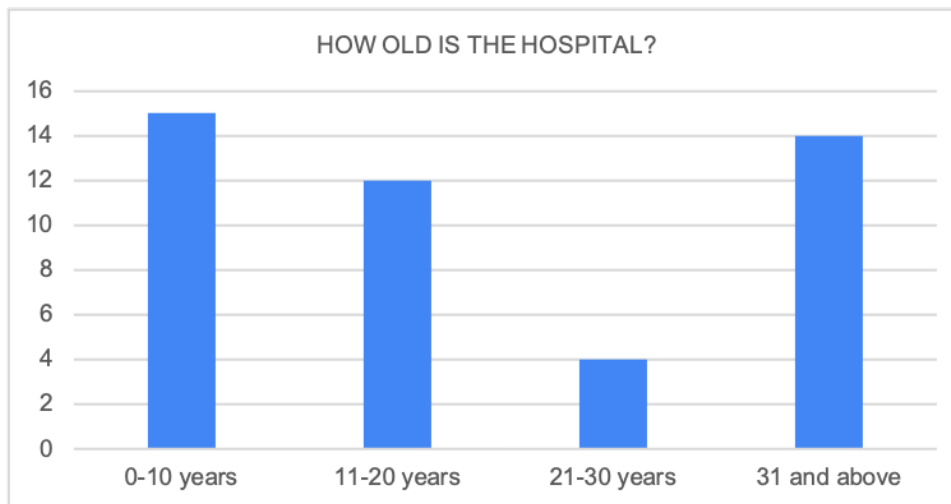


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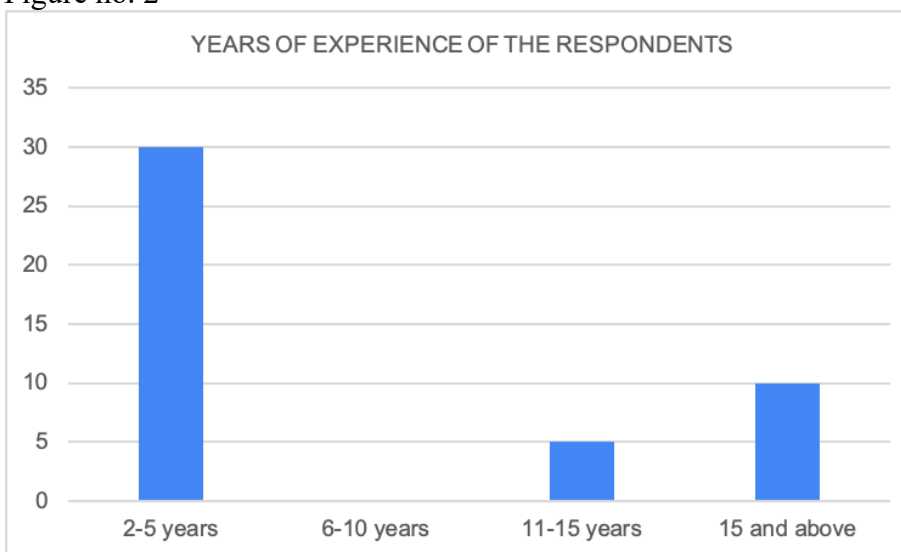


Figure no.3

KNOWLEDGE

KNOWLEDGE ON PROGRAMMING LANGUAGE

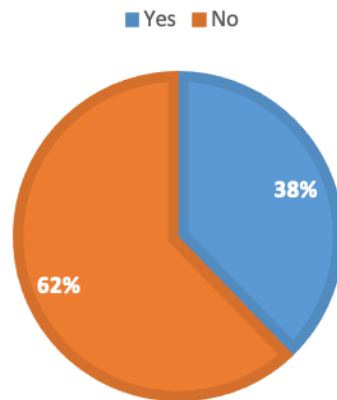


Figure no. 4

KNOWLEDGE ON AI APPLICATIONS IN DIAGNOSTIC SERVICES

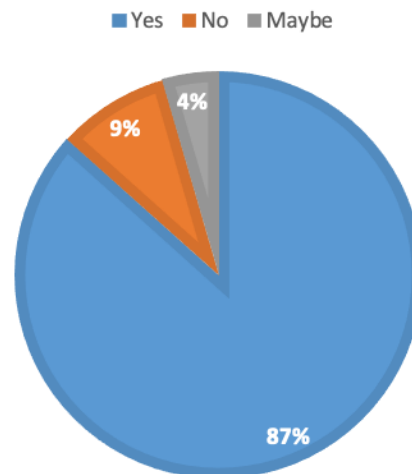


Figure no. 5

KNOWLEDGE ON AI APPLICATION IN THEIR HOSPITALS

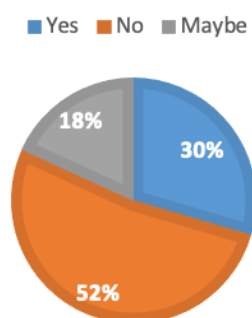


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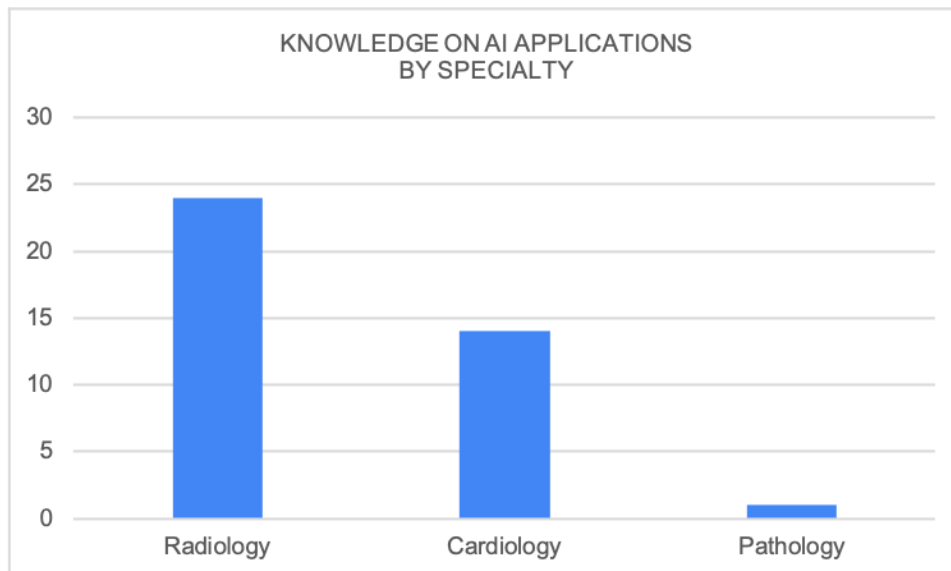


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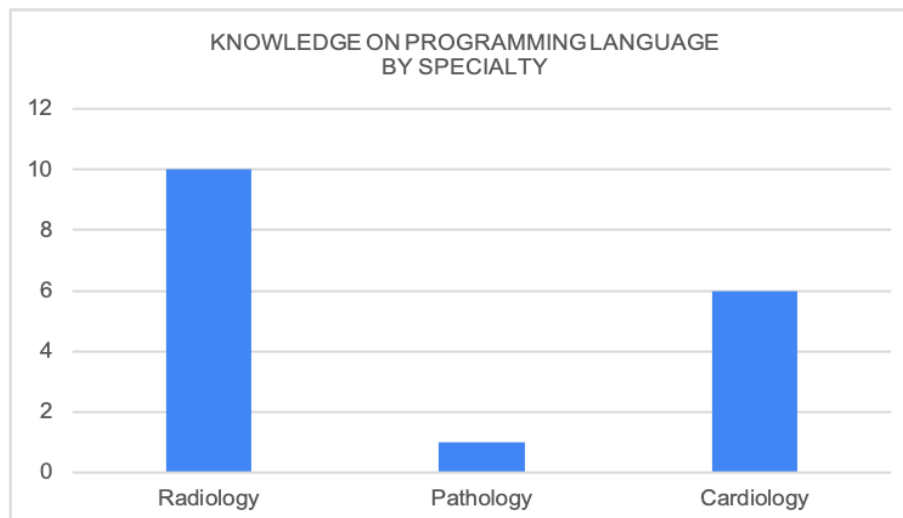


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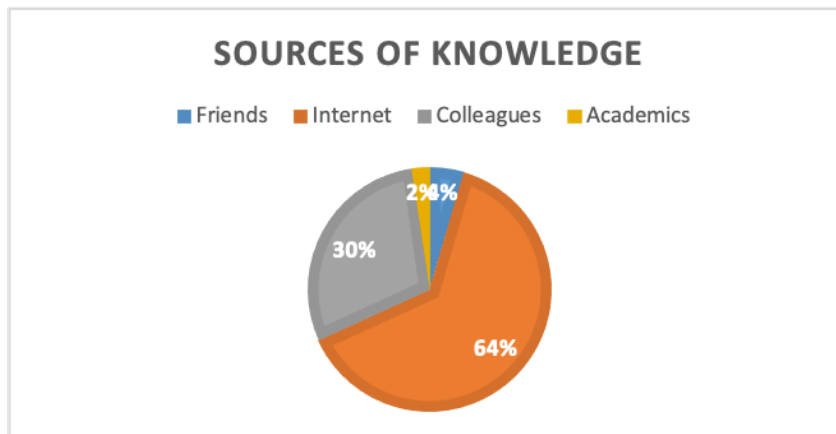


Figure no. 9

Sl No.	Which are the field of medicine that AI can be used more precisely?	Total
1	Direct decision making in treatment	8
2	Diagnosing the diseases	23
3	Assist the physician in decision making	13
4	Any other please specify	Where radiation is more
	Total	45

Table no. 2

ATTITUDE

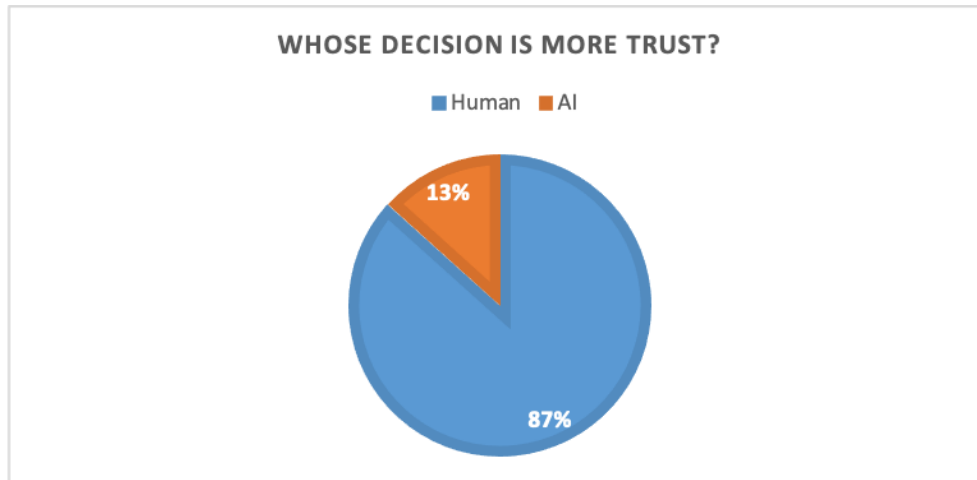


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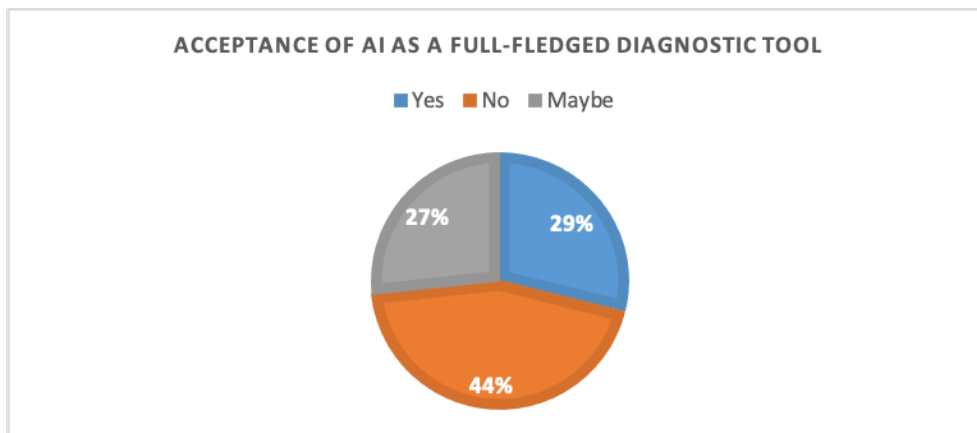


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PERCEPTION

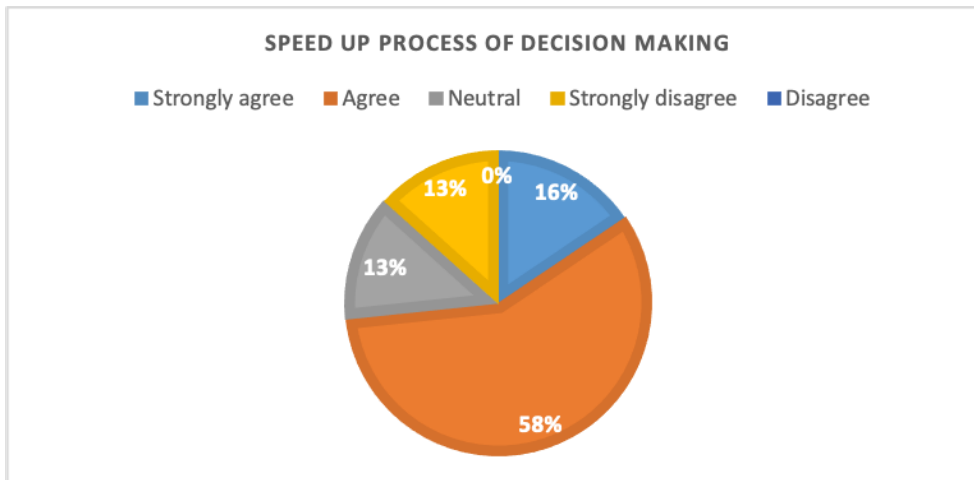


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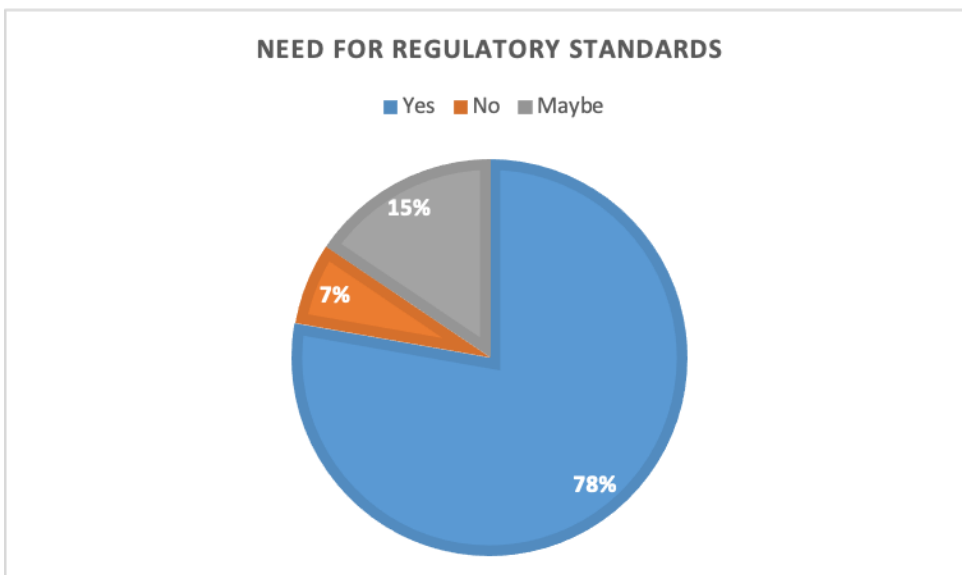


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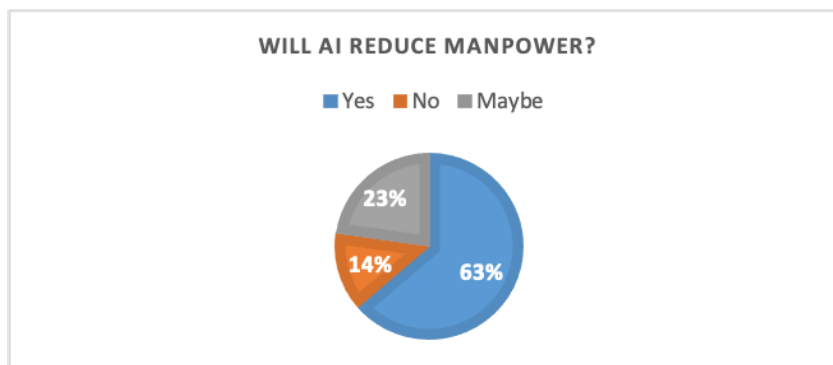


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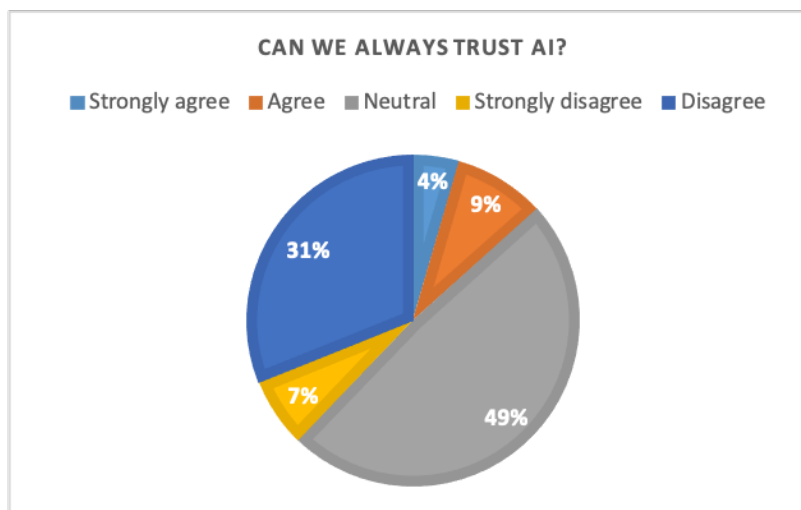


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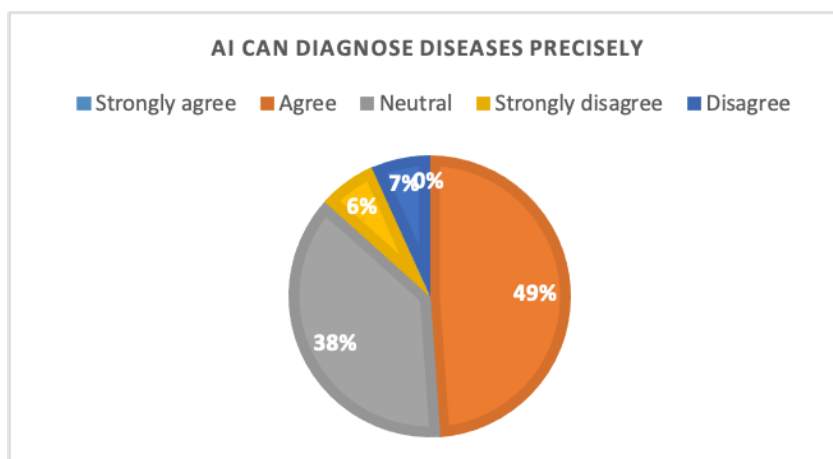


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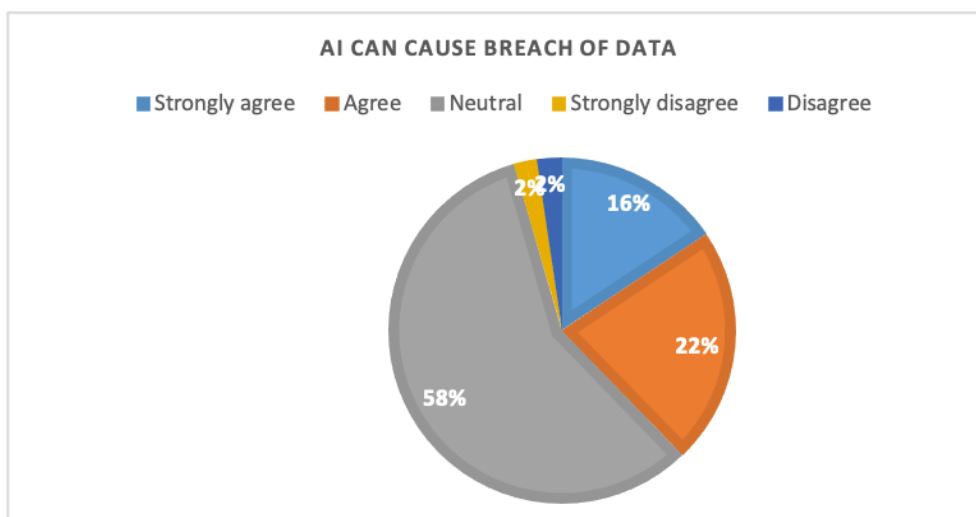


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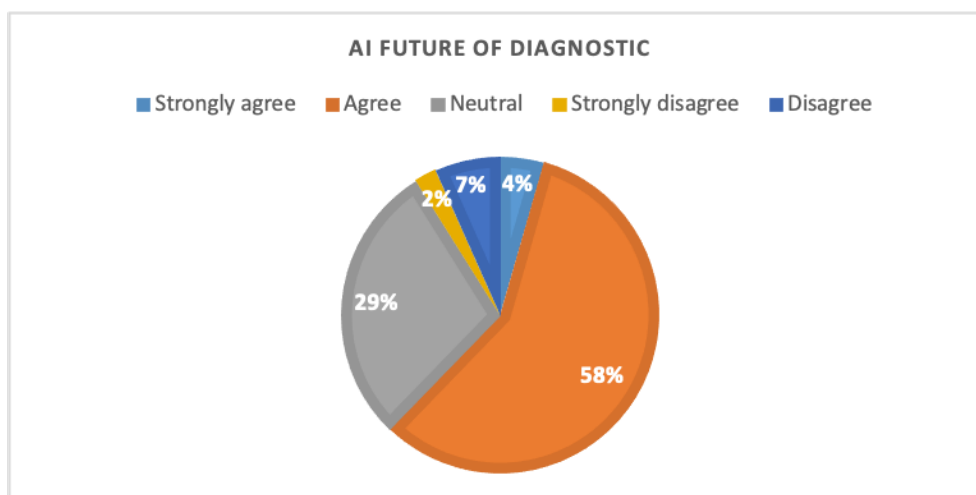


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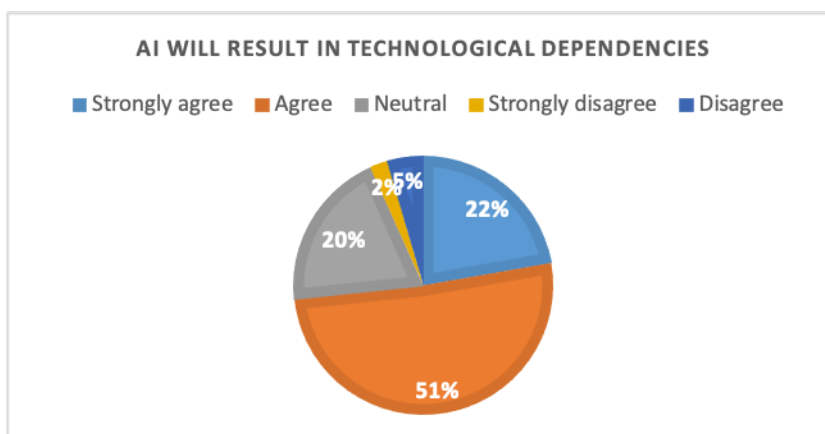


Figure no. 19

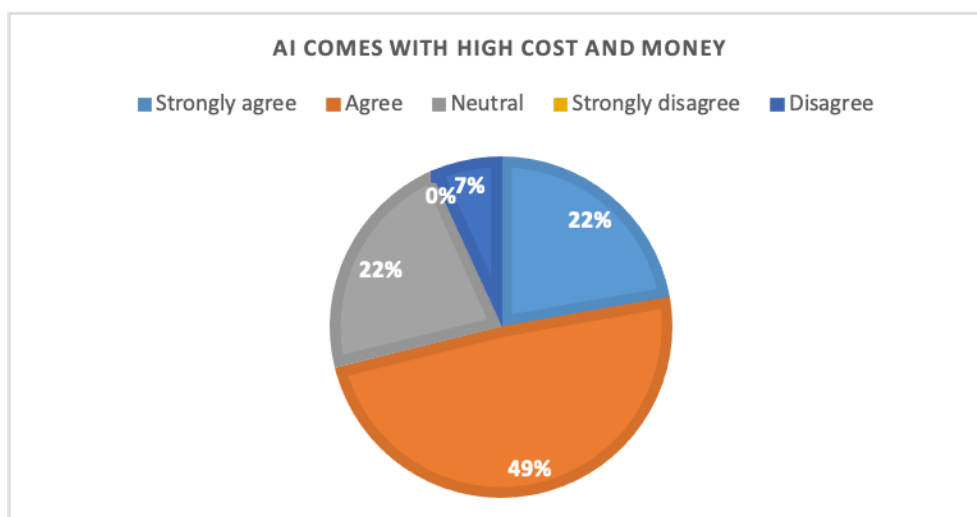


Figure no. 20

ANALYSIS

Data was collected using MS Excel. The months of experience was converted into number of years as few participants had more than 20 years of experience which do not seem feasible to put into the graph. The location of the facility were checked one by one and segregated according to the state. For the question with multiple responses, filter function was used to filter out the response and each response was counted and put it in the table. Graphs, Pie charts and tables were used to visualize the results of the data. A 2 x 2 table of was created in the Excel sheet. All the participants who had the knowledge of Programming language were counted using Countif function in Excel and who are willing to accept AI as a full-fledged diagnostic tool. On the other hand all those who do not have the knowledge of programming language and who are not willing to accept AI as a full-fledged diagnostic tool. Similar step is followed for the other two factors. Chi-square test using MS Excel with 95% confidence interval was used to check the factors associated with the acceptance of AI as a full-fledged diagnostic tool. The p-value $<0.05\%$ was considered as statistically significant. The knowledge on programming language gave a p-value of $0.88(p>0.05)$ which is not statistically significant. Another factor is the medical professionals who are working in the hospital that are using AI in their hospitals gave a p-value of $0.71(p>0.05)$ which is also not statistically significant. But the respondents who knew application of AI as a full-fledged diagnostic tool gave p-value of $0.0000019(p<0.05)$ which is statistically significant.

DISCUSSIONS

The study aims to know the knowledge, attitude, and perceptions on the application of AI in diagnostic services. To work with Artificial Intelligence, basic coding skills are required. 62% of the respondents in the study do not know any programming language. The primary school children are now getting coding classes. But the medical students do not have coding skills. The medical students and the working professionals need to be trained in this area so that they can practice as well as engage themselves in developing innovative technologies. This is going to increase their efficiency and can easily adapt in modern medical world. The results from the study show that only 10 out of 27 respondents who are working in the

radiology department and 6 out of 15 respondents who are working in the cardiology department knew programming language.

64% of the respondents came to know about the application of Artificial Intelligence in diagnostic services from the internet and 30% from colleagues.

The interventions with AI component should undergo a rigorous evaluation before impact on health outcomes can be demonstrated. A new guideline protocol that evaluates clinical trials with AI component is called The SPIRIT-AI (Standard Protocol Items: Recommendations for Interventional Trials-AI). 78% of the respondents agree that AI will need regulatory standards. But 15% are neutral to their response. The complex mathematical algorithm that is used in Artificial Intelligence is not an easy task to develop a regulatory standard that will cover all the aspects of the algorithms used. Huge datasets are used in developing an AI and ML algorithms. There is a possibility that the hackers would try to get into the system and cause breach of data. The study participants seem to be unfamiliar with the negative effects in building an AI algorithm. 58% of them are neutral to their responses when the question was being asked.

The study shows that 58% of the respondents agreed that AI is the future of diagnostics, but only 4% strongly agree with the statement. A survey-based study that was conducted by Jaideep Sur et al among 250 dental specialists to determine the knowledge, attitudes, and perceptions regarding the future of AI in oral radiology in India. In the study, 87% of the dentists are ready to use software that would be useful for radiological diagnosis. However, only 15% of them agreed that AI can make a better diagnosis than a human doctor, 45% of them were not sure.

A comparative study of Chest radiographs interpretation between AI algorithm and Radiology residents was conducted by Joy T. Wu et al. The results showed no statistical difference in sensitivity between the AI algorithm and the radiology residents. But the specificity and positive predictive value for the AI algorithm were higher. There is rapid increase in applications of AI in medicine in spite of having lots of concerns in its application. A question was asked about the services that use AI in their hospitals. The services that were mentioned by the respondents are radiology, echocardiography, cath-lab, diagnosis, reporting, in CT-scan to auto-detect areas coverage, in disease diagnosis, in MRI, billing, record keeping. There are still possibility of having other services being used in their hospitals which they might not be aware of.

AI aims to mimic human cognitive functions. (Fei Jiang et al, 2017) The authors believed that Artificial Intelligence is not going to replace human physicians but instead it is going to assist the physicians in making better clinical decisions. It could also replace human judgment in certain functional areas.

The access to powerful technologies for extracting, analysing and managing heterogeneous medical records coupled with patient lifestyle information, will boost the PM (Personalised Medicine) paradigm shift with significant ethical and societal implications.

AI constitutes a collection of intellectual property. The systems that are already in use in clinical laboratories need to be documented, evaluated and regulated properly. AI has its

drawbacks and therefore, we cannot always rely on AI fully. But there are certain fields where AI can be used. 58% agreed with the statement that AI is the future of diagnostics.

A lot of people has stopped using pen and paper for calculation. The shopkeepers have started using calculators and mobile phones to do even a small calculations. Some bigger shops have started using different accounting software to maintain their day-to-day transactions. Another example is we get our answers at the finger-tip. Internet has played a very important role in gathering knowledge. Similarly, in the near future their could be technological dependencies even in health care. The perceptions of the study participants is that 51% agreed that it's going to increase technological dependencies, while 20% of them are neutral to their response and 22% of them disagree to the statement.

The study do not aim to analyze the cost of AI application. From the perspective of the study participants, 49% of them agreed that AI will come with high cost in terms of time and money. A study by Min-Suk Heo et al., (2020) mentioned that it is a time consuming task to build an AI algorithm that could cover most of the aspects. It also to collect a lot of datasets that is never an easy task.

Chapter -5: CONCLUSION

The study needs to be conducted in a larger sample size where the representatives of another department should also be involved. The sample size is not enough to generalize South Indian's knowledge about AI application in diagnostics. The study showed that the paramedical staff who are working in the radiology department and cardiology department do not accept Artificial Intelligence as a full-fledged diagnostic tool. The study participants trust the human physician's decision more than Artificial Intelligence. The application of Artificial Intelligence should be restricted to only certain areas of diagnosis such as diagnosing the disease with the given inputs, assist the physician in decision making rather than depending on the AI's decision. Apart from that one respondent told that it can be applied in places where radiation exposure is more, which can reduce occupational hazards of the staff working the department. People who know about Artificial Intelligence are more likely to accept it as a full-fledged diagnostic tool. Probably they understand the pros and cons of the application of AI in diagnostics. AI should have proper regulatory standards that can deal with complex mathematical algorithms.

Chapter 6: RECOMMENDATIONS

The health care professional should have the basic knowledge of programming They also need training on the applications of AI in the diagnostic field, so that they can at least decide the services they can apply AI. Coding classes should be given from primary school level so that in the future they will have brief understanding of how Artificial Intelligence work and will be helpful whenever they take up medical profession. Having both the technological as well as the clinical knowledge these candidates can be in a far better position to make use of Artificial Intelligence. The hospitals are required to introduce the products they are using in their hospitals to all the respective staffs. The medical personnel also need to maintain the privacy and confidentiality of the data they are sharing with others. The extent to which AI can cause data breach is not known but from the study it can be seen that most of them are neutral to their responses. There is a need for the hospitals to engage every medical as well

as paramedical staffs of the respective departments in the use of AI. This could help them to be aware of the various applications of AI and how important the datasets could be, which they are keeping in their hospitals. This could help the paramedics to be very cautious while maintaining the records.

LIMITATIONS

Due to time constraints and the ongoing pandemic hit, it was hard to reach the health care workers resulting in a less sample size. The biases in the study could not be ruled out due to low sample size and being purposive sampling technique.

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APPENDIX

Questionnaire for the application of AI (Artificial Intelligence) in diagnostic center of hospital services.

1. Please Mention your Specialty (radiology, cardiology, oncology, pathology, others)
2. Your designation
3. Years of Experience- (in years)
4. Location of the facility you are working
5. Do you know any Programming language? (Yes/No)
6. How old is the hospital?
7. Do you use AI in diagnostic services in your hospital?
8. If yes AI since when and in which all services.
9. Do you know that AI is used as a diagnostic tool? (Yes/No)
10. If yes. From where you came to know?
 1. Friends
 2. Colleagues
 3. Internet
 4. Any other please specify_____
11. Which are the field of medicine that AI can be used more precisely?
 - a. Direct decision making in treatment
 - b. Diagnosing the diseases
 - c. Assist the physician in decision making
 - d. Any other please specify_____
12. Whose decision would you trust more? AI or human?
13. Will AI reduce manpower in the future? (Yes/No/Maybe)
14. Would you accept if AI is used as a full-fledged diagnostic tool? (Yes/No/May be)
15. Do you think AI will need regulatory standards? (yes/No/May be)
16. How much do you agree on the below statements? (Strongly agree/agree/strongly disagree/disagree/not sure)
 - a. AI will speed up the process of decision making
 - b. AI can diagnose the diseases precisely.
 - c. We can always trust AI.
 - d. AI is the future in the field of diagnostics.
 - e. AI can cause breach of data.
 - f. It will increase technological dependencies.
 - g. AI comes with high cost in terms of time and money.