



Research Paper

## A Study to Understand Perception of Doctors towards Robust Technology in Healthcare Industry

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### ABSTRACT- INTRODUCTION

The healthcare sector is in the midst of a deep transition as it moves from the traditional service fee model to quality-based performance. But the success of this transformation depends on the implementation of robust technology systems and processes, standard practices and the efficient sharing of information between health care providers, laboratories, pharmacies and patients.

#### Methods

The cross-sectional survey of doctors was conducted on 5/02/2021. In our study, 30 doctors have been selected from different departments using non-probability convenience sampling and have been approached through online Google Forms.

#### Result

The results of this study show that 73% of physicians used healthcare technology in their hospitals. Many hospitals are referring to state-of-the-art healthcare technology, and 60 per cent of them say that it improves the hospital's reputation, improvise the quality of care and also saves time and money. 80% of them say that healthcare technology cannot replace the workforce.

#### Conclusion

The analysis concludes that the perception of physicians related to healthcare technology is 76% that this technology is easy and convenient to use. Doctors believe that these technologies can enhance the quality of health care.

Technology also improves the hospital's reputation, saves time and money and improves patient safety. Ninety per cent of physicians say that this new technology is useful for both treatment and emergency situations.

**KEYWORDS:** healthcare sector, conventional service, robust technology

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### I. INTRODUCTION

Technology plays an important role in every industry as well as in our personal lives in today's world. Health care is certainly one of the most important of all the industries in which technology plays a crucial role. This merger is responsible for improving and saving countless lives around the world.

Health technology is defined as "application of organized knowledge and skills in the form of devices, medicines, vaccines, procedures, and systems developed to solve a health problem and improve quality of lives".<sup>1)</sup> This includes pharmaceuticals, devices, procedures and organizational systems used in the healthcare sector, as well as computer-supported information systems.

Medical technology is a broad field where innovation plays a crucial role in sustaining health. From "small" innovations such as adhesive bandages and ankle braces to larger, more complex technologies such as MRI machines, artificial organs and robotic prosthetic limbs, technology has undoubtedly had an incredible impact on medicine.<sup>2)</sup>

Medical technology covers a wide range of healthcare products and is used for the treatment of human diseases and medical conditions. These technologies are designed to improve the quality of health care delivered through early diagnosis, less invasive treatment options and reduced hospital stays and rehabilitation periods.<sup>3)</sup> Recent advances in medical technology have also focused on reducing costs. Medical technology can cover a wide range of medical devices, information technology, biotechnology and healthcare services.<sup>4)</sup>

Medical technicians at the hospital are like crew members in a play. Patients don't often see them, but they are vital members of the healthcare team. Medical technologists (also known as clinical laboratory

scientists) are professionals working in a hospital laboratory and performing a wide range of tests. Doctors make a lot of decisions about their diagnosis and treatment of the disease.

## **II. REVIEW OF LITERATURE**

The technological revolution and medical advances made by combining vast amounts of available data, cloud computing services and machine learning are creating AI-based solutions that provide expert insight and analysis on a mass scale and at relatively low cost (Mohsen Vatandoost, 2018).<sup>5)</sup>

The aim is to show how healthcare facilities can look from an architectural design point of view in the near future. To this end, we review the newly introduced technology and medical advances in the field of healthcare, such as artificial intelligence (AI), robotic surgery, 3D printing, and information technology (IT), and suggest how these advances may affect the architectural design of future healing.

Telemedicine includes electronic information and medical technology. It links health care to vast distances that would benefit both patients and physicians. (K.M.Shah 2017).<sup>6)</sup>

The delivery of health care is governed by a three-tier system and health is the primary responsibility of the state. There is a difference in quality and accessibility of health care between urban and rural areas. The North-Eastern countries of India are particularly affected by poverty, lack of development and civil conflict. Major limitations on growth and development in these countries have been identified

The result of the study is that telemedicine in health care could prove useful to patients in remote regions and rural physicians in India. Telemedicine can be seen as an alternative to face-to-face patient care in the near future.

The objective of artificial intelligence (AI) is to make believe that the cognitive function of humans. (F.Jiang, 2017). This brings with it a conversion in health care, driven by increased availability of health data and rapid progress in analytic techniques. Popular AI techniques include machine learning methods for structured data, such as classic vector support and neural networking, and modern deep learning, as well as natural language processing for unstructured data. Major diseases using AI tools include cancer, neurology and cardiology. They then examined more details in AI applications of stroke in three main areas of early detection, diagnosis and treatment.<sup>7)</sup>

Healthcare in India is at a very nascent stage and it is undergoing a paradigm shift from a static status to dynamic status.

Information Technology (IT) has the potential to improve the quality, safety and efficiency of healthcare. (Sampada gulavani, 2010). Communication technologies have had a significant impact on health care and the provision of health services. From telemedicine to electronic health records, a variety of health services have been shown to improve operational and administrative efficiencies, clinical outcomes, documentation and information flows in global settings, home care units, rural health centers and large urban hospitals.<sup>8)</sup>

Progression in medical technology, global competitive economy and reduce life time technologies are compelling hospitals for the adoption of new equipment. Hospitals are the main buyers and user of medical technologies. Their technology implementation decisions

not only affect the financial resources but also have a great impact in determination of degree of quality the system is capable to produce.

The role of technology in health care is important because of the accuracy of the output needed to provide quality health care. It is noted that technology-related decisions are made by people with little awareness of the issue of the right choice of technology and its possible impact on the quality of health care. (Aayaz Rehmad, 2016)<sup>9)</sup>

### **Research objective**

The objectives describe many ways in which health technologies may have a positive impact on health, health care and health equity. This includes improving the quality of health care and improving the safety of health care.

The objective of this study is to assess the perception of the doctors related to robust technology in healthcare industry.

An important decision problem for managers is to develop an assessment system to guide process selection decisions, by integrating the up-to-date technology and techniques available, at very early stage of the decision process **Research object** The objective of this study is to assess physicians' perception of robust technology in the healthcare sector.

### III. METHODOLOGY

This study is based on the perception of the doctors regarding robust technology in healthcare field.

The cross-sectional survey was conducted among doctors on 5/02/2021. In our study there are 30 doctors which were selected from various departments and using non-probability convenience sampling and were approached through online Google Forms. The questionnaire consisted of 15 questions, closed structured questions asked to the doctors. The questionnaire was divided into following aspects such as demographic details; include name, age, sex, marital status, education level, specialty and duration of experience. The questions were based on views and opinions with healthcare technology, like how they are familiar with the technology. Participants have ranked on the basis of challenges and difficulties faced while using modern technology. Further on basis quality life improvement and on the patient safety. The questionnaire will also measure the satisfaction level among the doctors.

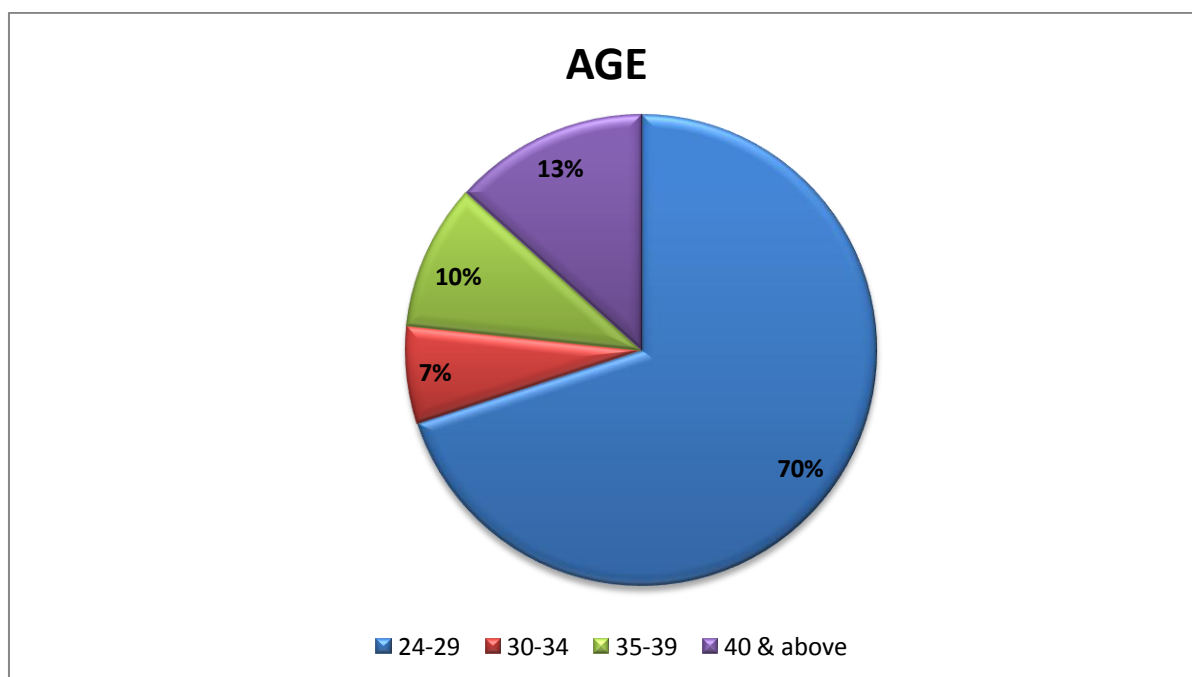
#### Analysis and Interpretation

The analysis and interpretation of this study is based on perceptions of the doctors towards robust technology in healthcare industry. The data collected was from 30 doctors from various hospitals of Mumbai. This data include demographic variable and survey questionnaire include response and percentage.

#### I. DEMOGRAPHIC VARIABLE

##### i) AGE:

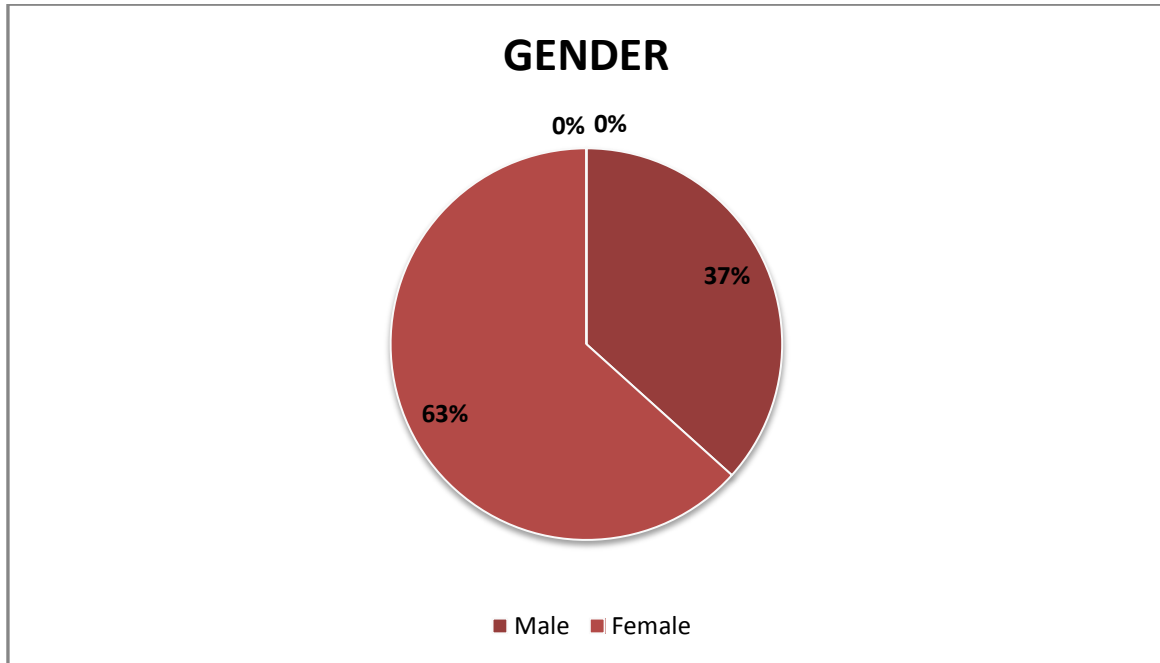
Age Group	No. of Respondent
24-29	21
30-34	2
35-39	3
40 & above	4
Total	30



From the above chart and table, it is observed that, 70% respondent belongs to age group of 24-29. 7% respondent belongs to age group of 30-34. 10% respondent belongs to age group of 35-39. 13% respondent belongs to age group of 40 & above.

##### ii) GENDER:

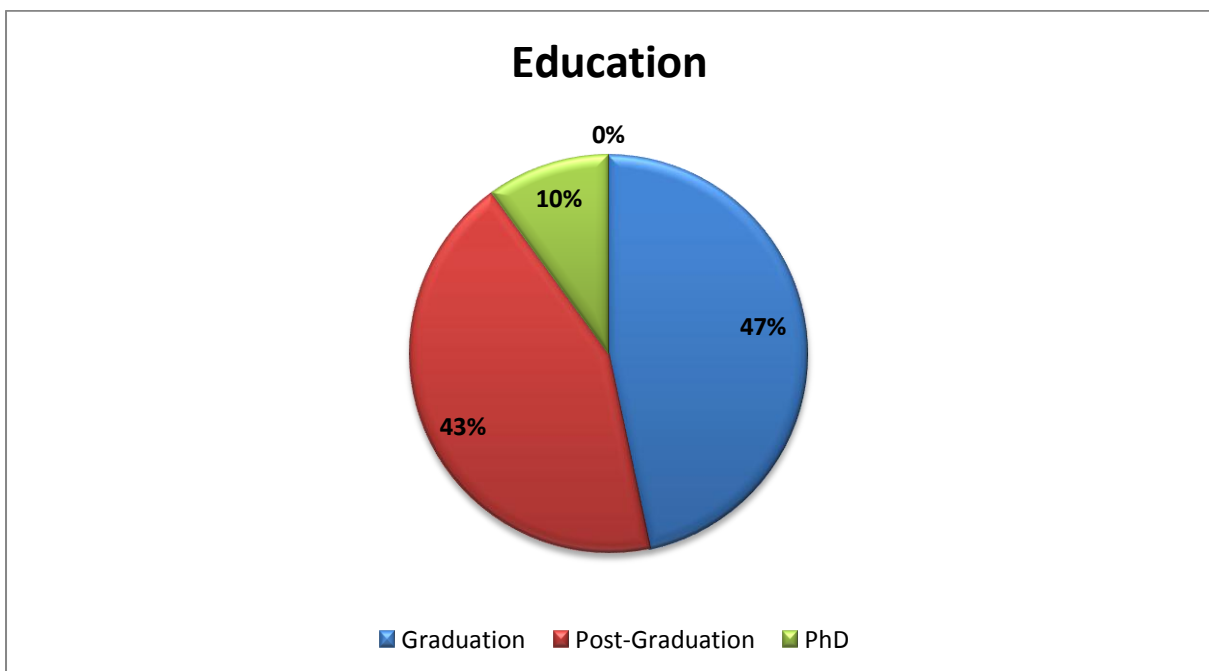
Gender	No. of Respondent
Male	11
Female	19
Total	30



From the above chart and table, it is observed that, 63% of respondents are female. 37% of respondents are male.

**iii) EDUCATION:**

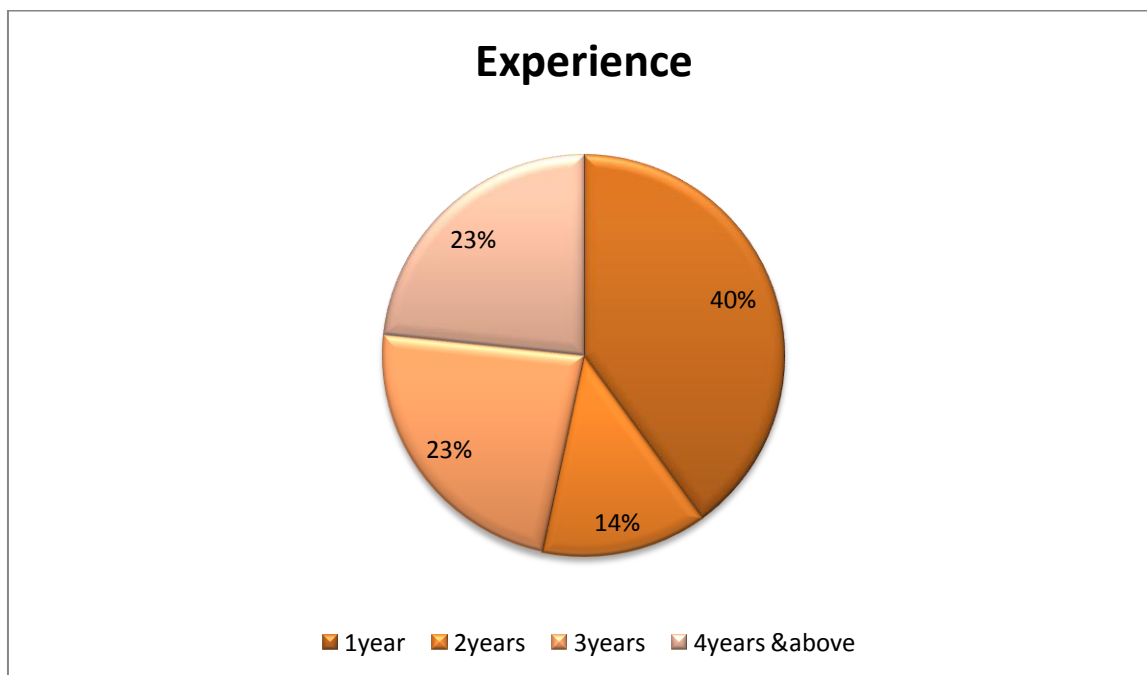
Education	No. of Respondent
Graduation	14
Post-Graduation	13
PhD	03
Total	30



From the above given table, it is observed that, 48% of respondents have completed their graduation. 43% of respondents have completed their post-graduation. 3% of respondents have completed their PhD.

**iv) EXPERIENCE:**

Years of Experience	No. of Respondent
1 year	12
2 years	4
3 years	7
4 years & above	7
Total	30

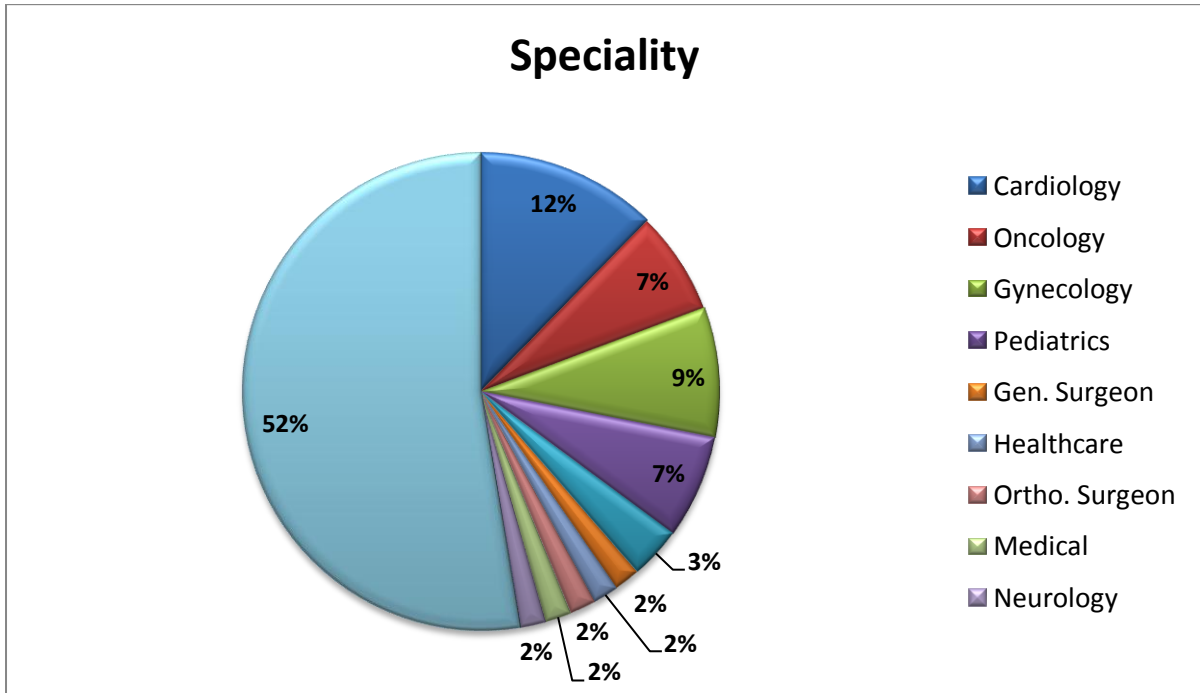


From the above chart and table, it is observed that, 40% respondents have year of experience in healthcare field. 14% respondents have years of experience in healthcare field. 23% respondents have years of experience in healthcare field. 23% respondents have 4 & above years of experience in healthcare field.

**v) SPECIALITY:**

From given below the chart and table, it is observed that, 23% respondents are from the department of cardiology. 14% respondents are from the department of oncology. 17% respondents are from the department of gynecology. 14% respondents are from the department of pediatrics. 7% respondents are from the department of ophthalmology. 3% respondents are from the department of General surgery. 3% respondents are from the department of healthcare. 2% respondents are from the department of Orthopedic Surgery. 2% respondents are from respondents are from ayurveda.

Specialty	No. of Respondents
Cardiology	7
Oncology	4
Gynecology	5
Pediatrics	4
Ophthalmology	2
General Surgeon	1
Healthcare	1
Orthopedic Surgeon	1
Medical	1
Neurology	1
Ayurveda	3
Total	30

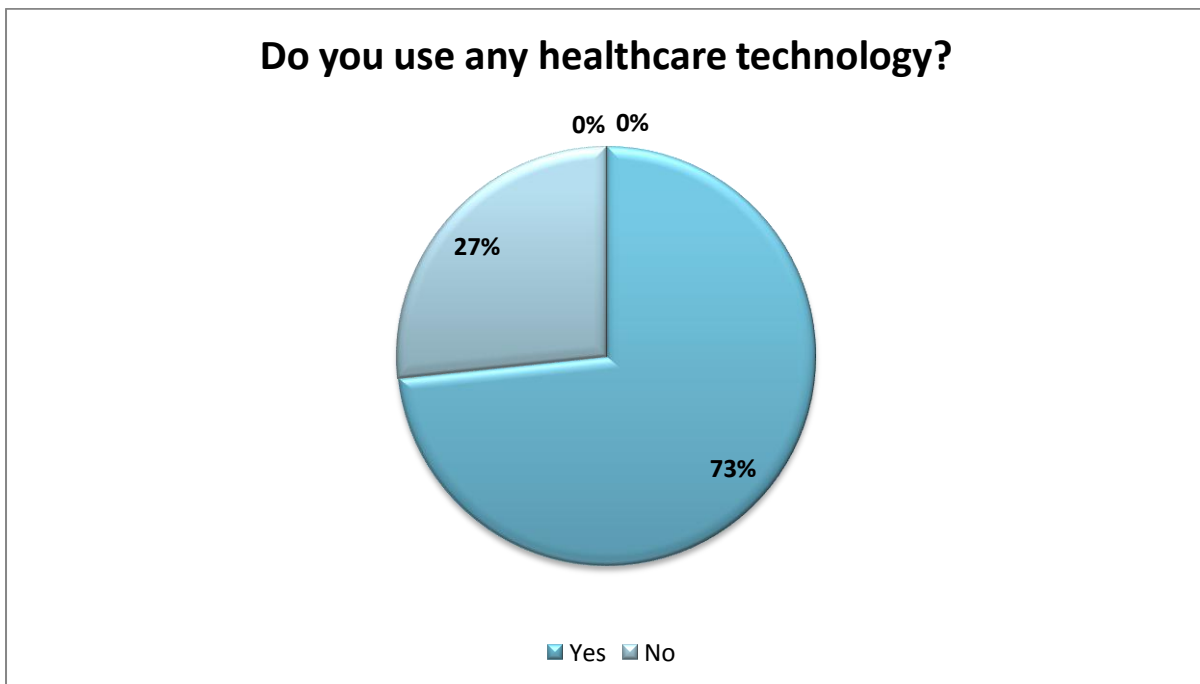


## II) Survey questionnaire

In survey questionnaire, there are 10 questions which is asked to the respondents. The option of the questionnaire was related to the doctor's views and opinions.

### vi) Do you use any healthcare technology?

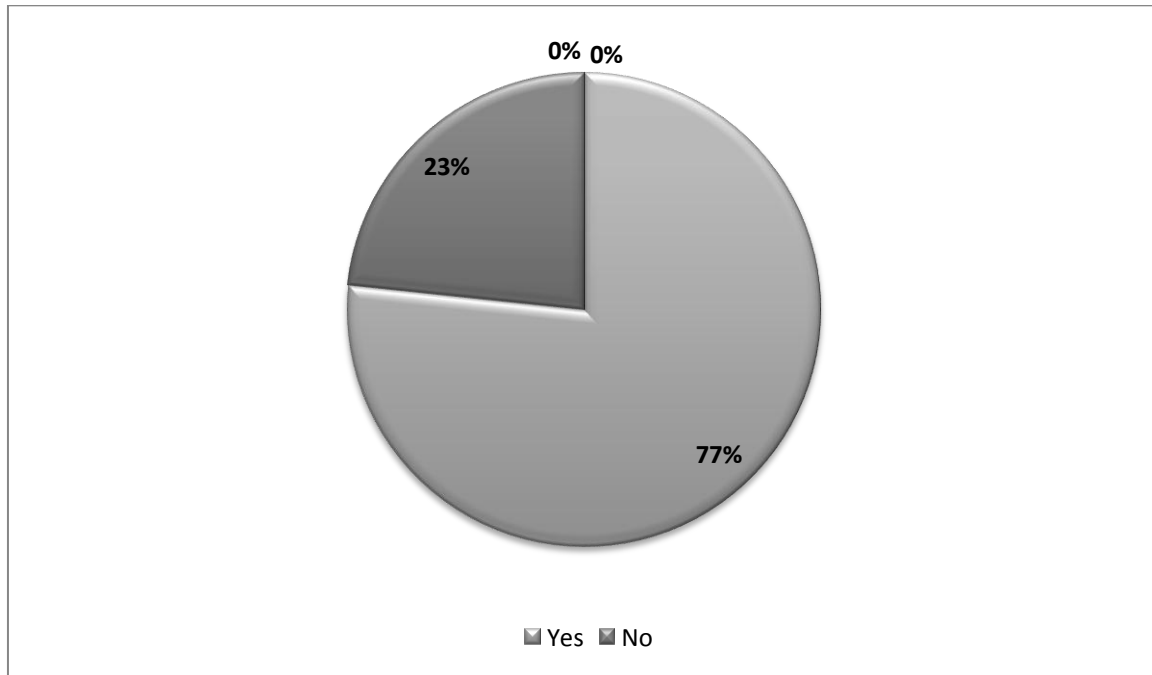
Do you use any healthcare technology	No. of respondents
Yes	22
No	8
Total	30



From the above chart, it is observed that, 73% respondents use healthcare technologies. 27% respondents do not use healthcare technologies.

**vii) If yes, then do you find it easy and convenient while using?**

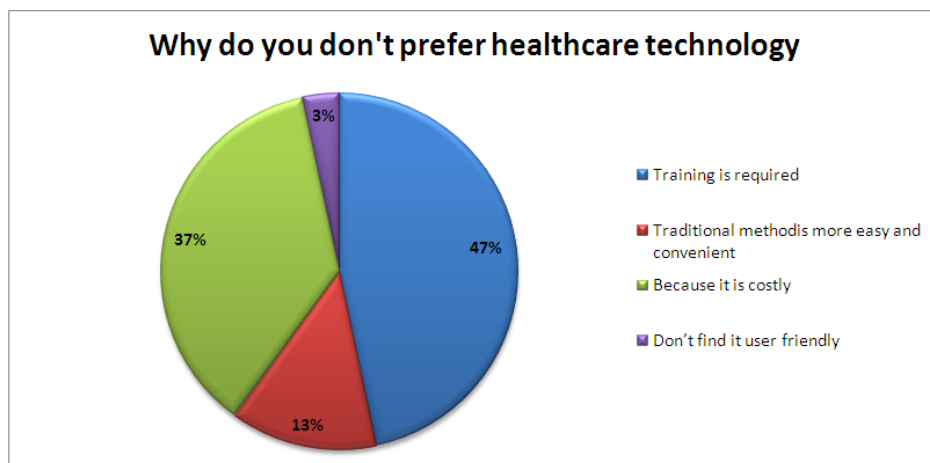
If yes then do you find it easy and convenient while using?	No. of Respondents
Yes	23
No	7
Total	30



From the above given chart and table, it is observed that, 77% respondents find it easy and convenient using healthcare technologies, 23% respondents don't find it easy and convenient using healthcare technologies.

**viii) Why do you don't prefer healthcare technology?**

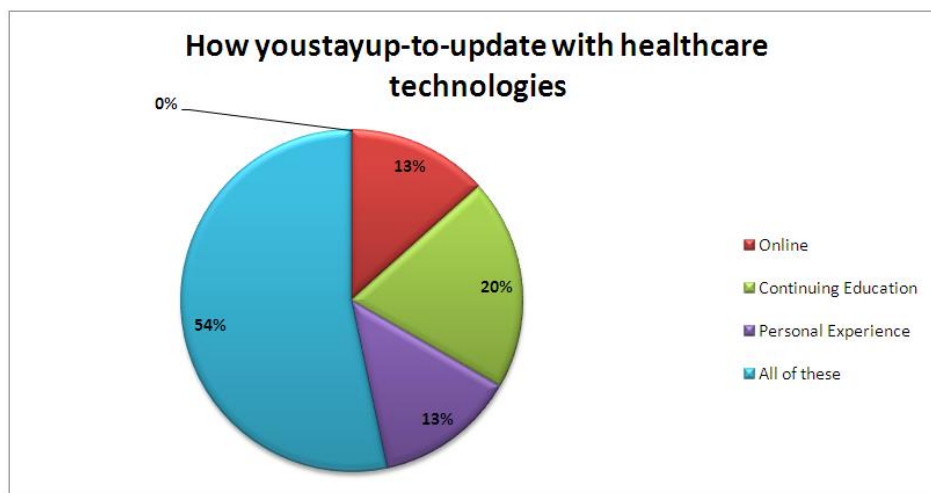
Why do you prefer don't healthcare technology?	No. of Respondents
Training is required	14
Traditional method is more easy and convenient	4
Because it is costly	11
Don't find it user friendly	1
Total	30



From the above given chart and table, it is observed that, 47% respondents say that training is required to adapt the healthcare technology. 13% respondents say that traditional method is more easy and convenient. 37% respondents say that, the healthcare technology is costly. 3% respondents don't find it user friendly.

**ix) How you stay up-to-date with healthcare technologies?**

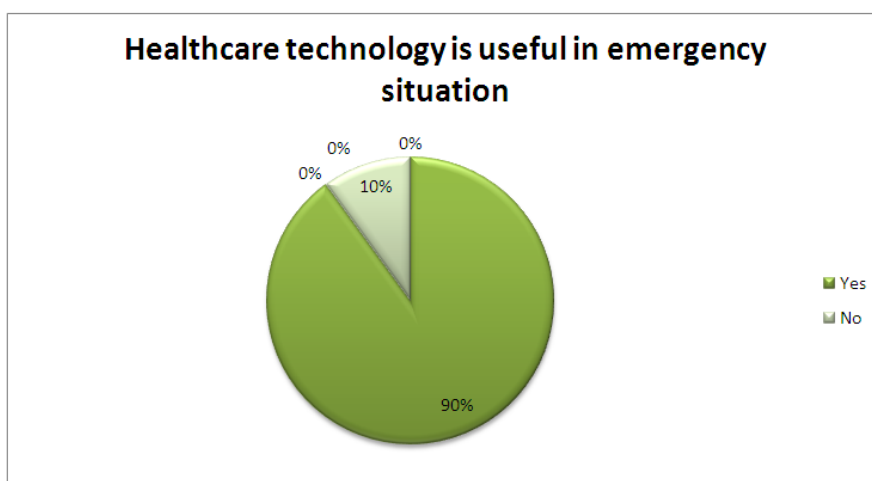
How you stay up-to-date with healthcare technologies	No. of Respondents
Online	4
Continuing Education	6
Personal Experience	4
All of these	16
Total	30



From the above given chart and table, 13% respondents surf more online to stay up-to-date with healthcare technologies. 20% respondents opted for continual education. 13% respondents opted for personal experience. 54% respondents voted for all of the above listed options.

**x) Healthcare technology is useful in emergency situation**

Healthcare technology is useful in emergency situation	No. of Respondents
Yes	27
No	3
Total	30

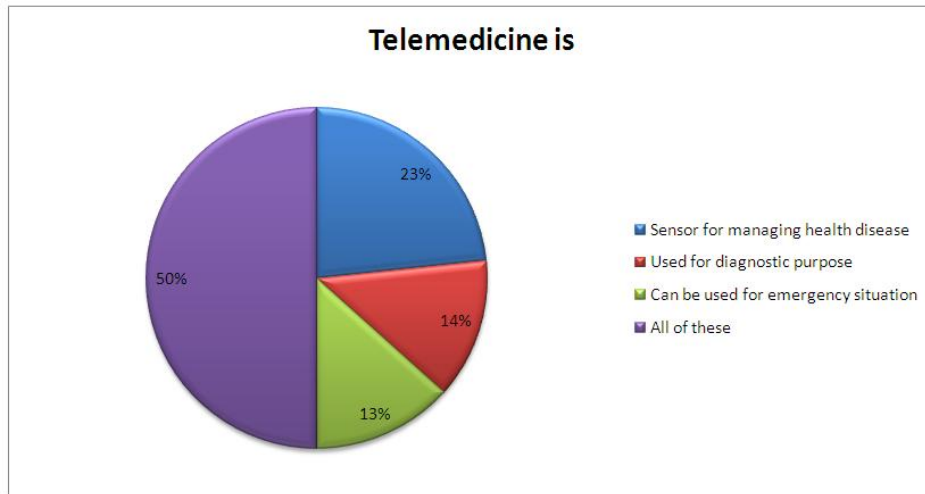


From the given chart and table, it is observed that, 90% respondents use healthcare technology in emergency situation. 10% respondents do not use healthcare technology in emergency situation.



**xi) Telemedicine is...**

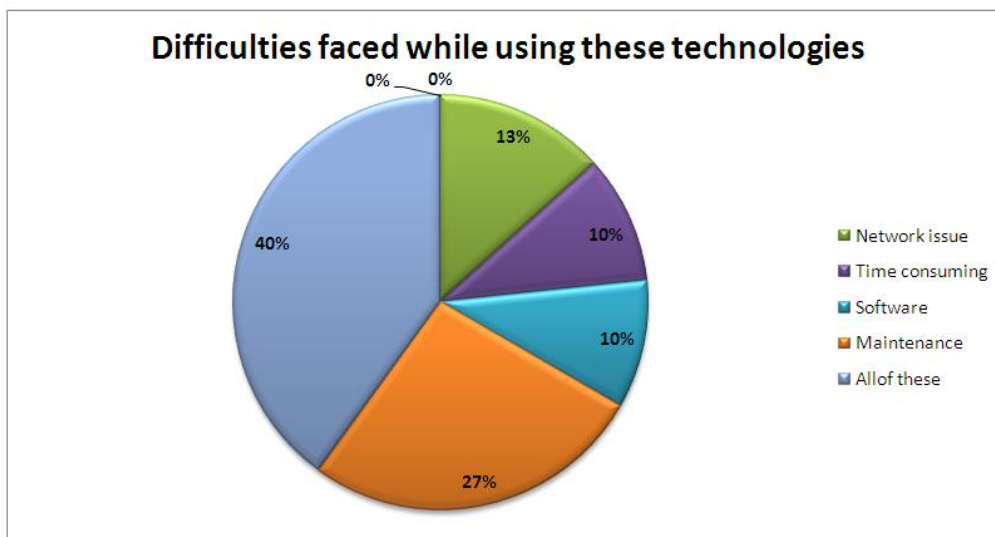
Telemedicine is	No. of Respondents
Sensor for managing health disease	7
Used for diagnostic purpose	4
Can be used for emergency situation	4
All of these	15
Total	30



From the above given chart and table, it is observed that, 23% respondents say that telemedicine is sensor for managing health disease. 14% respondents say that telemedicine is used for diagnostic purpose. 13% respondents say that telemedicine can be used for emergency situation. 50% respondents say all of the above options are convenient.

**xii) What difficulties you face while using these technologies?**

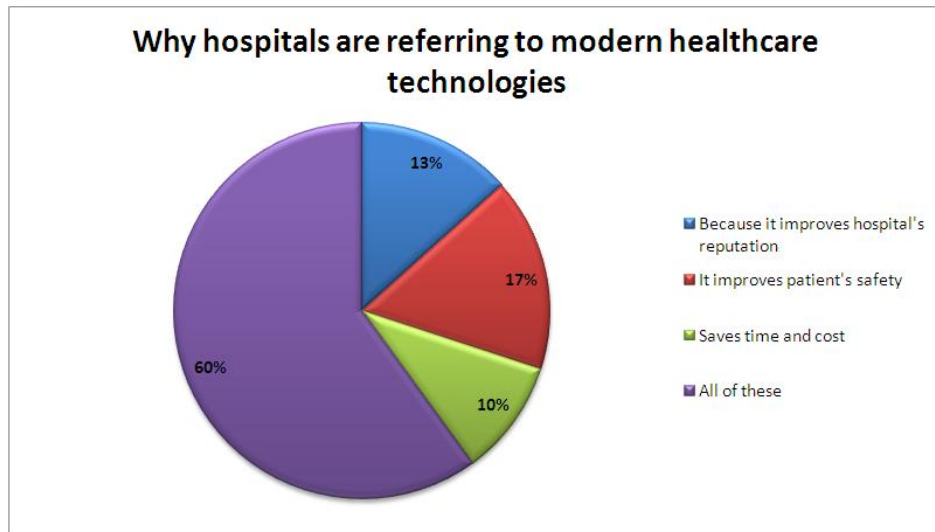
Difficulties faced while using these technologies	No. of Respondents
Network issue	4
Time consuming	3
Software issue	3
Maintenance	8
All of these	12
Total	30



From the above given chart and table, it is observed that, 13% respondents face the network issue. 10% respondents say it is time consuming. 10% respondents face software issue. 27% respondents face maintenance issue. 40% respondents say they face all the above listed issues.

**xiii) Why hospitals are referring to modern healthcare technologies?**

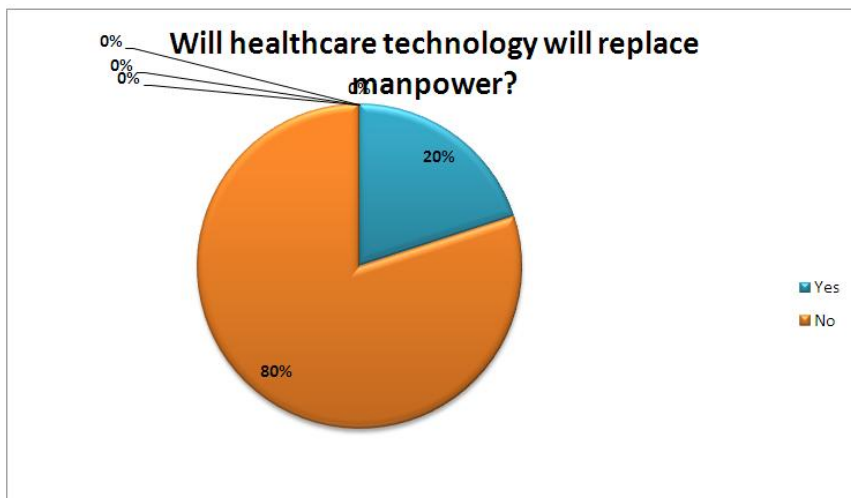
Hospitals are referring to modern healthcare technologies	No. of Respondents
Because it improves hospital's reputation	04
It improves patient's safety	05
Saves time and cost	03
All of these	18
Total	30



From the above given chart and table, it is observed that, 13% respondents are referring to modern healthcare technologies because it improves hospital's reputation. 17% respondents say it improves patient's safety. 10% respondents says it saves time and cost. 60% respondents agree to all of the above listed options.

**xiv) Do you think healthcare technology will replace manpower?**

Will healthcare technology replace manpower?	No. of Respondents
Yes	06
No	24
Total	30



From the above given chart and table, it is observed that, 20% respondents think that healthcare technology will replace manpower. 80% respondents think that healthcare technology will not replace manpower.

**xv) If yes than why you think so responses**

Yes, because it is more convenient for staff too.

Yes there are high chances in the future that will replace manpower, because of upcoming modern technology.

- From the above data 10% respondents viewed as yes there are high chances in the future that will replace manpower, because of upcoming modern technology. 10% view their comment saying healthcare technology will replace manpower, because it is more convenient to staff too. Whereas 80% respondents don't think that healthcare technology will replace the manpower.

#### **IV. RESULT**

A total of 30 medical specialists participated in the survey. Out of a total of 30 doctors, 63% were male and 37% completed the questionnaire. The results of this study show that 73% of doctors used healthcare technology in their hospitals. 77% of physicians find healthcare technology easy and convenient. 47 per cent of the response indicates that training is needed to adapt healthcare technologies, and 37 per cent say that it is very costly. 53 per cent remain up to date on technology with the help of continuing education and personal experience. 90% of doctors say that healthcare technology is useful in emergency situations. Telemedicine is a medicine practice that uses technology to provide remote care, and 50 percent of doctors say that it is used for diagnostic purposes as well as in emergency situations. Some doctors also faced problems while using these technologies, 27 per cent say that technologies have a maintenance problem. Many hospitals are referring to state-of-the-art healthcare technology, and 60 per cent of them say that it improves the reputation of the hospital, can also improvise the quality of care and also save time and money. 80 per cent of them say that healthcare technology cannot replace the workforce. One of the responses from the physicians says that there is a chance of replacing the workforce in the future because of the upcoming technology and, contrary to the other response, says that it cannot be replaced, but that technology is very useful and accurate for staff and doctors.

#### **V. CONCLUSION**

Technology allows for more and more accurate and personalized medicines. The analysis concludes that the perception of physicians related to healthcare technology is 76% that this technology is easy and convenient to use. Doctors believe that these technologies can enhance the quality of health care.

Technology also improves the hospital's reputation, saves time and money and improves patient safety. Ninety per cent of physicians say that this new technology is useful for both treatment and emergency situations.

However, healthcare technology cannot replace medical staff, as there is also some disadvantage, and hospitals cannot fully relay technology, and 80 per cent of doctors say that healthcare technology cannot replace the workforce. In conclusion, we can say that healthcare technology helps doctors with different treatments under the supervision of medical staff.

pursuing the issue linked to telemedicine process from a patient's and doctor's point of view. Self-reporting approach was used for the data collection, which is considered to be appropriate for assessing physicians' intention to adopt telemedicine technology. This method of collecting data through a questionnaire has been and has been proven to be

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