



Role of Embedded Systems in Health Monitoring Management Systems in Hospitals in Indian Perspective

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Abstract— This paper consists of a small questionnaire survey regarding the role of embedded systems in the hospitals. In this paper we generally came to know about what are the facilities people are getting in their health sector institutions. Are they satisfied with these facilities? What are the challenges they are still facing regarding these facilities? Are these facilities still in their reach or they are just out of their reach? Such questions have been answered in this survey. We also came to know about the opinion of people regarding these facilities and what do they think regarding further improvement of these facilities. People from different states have participated in this survey and responded very beautifully for this research.

Keywords— Embedded system, Wi Fi, ECG, MRI, CT Scan, incineration.

INTRODUCTION

Embedded systems find wide applications in consumer, commercial, automotive, industrial and healthcare markets. Usually, embedded device runs on a single device which can operate a single one to do its job. Sometimes a device generally containing Internet usually find it difficult to connect due to some network problems and various others issues. Nowadays constant monitoring of patients is either manual one or Wi Fi based.

Wi Fi based systems sometimes become slow due to increased exponential stability. Embedded systems can be found inside many devices from monitoring health fitness devices to lifesaving medical equipment. These lifesaving medical equipment greatly help the medical staff to diagnose the disease and also it become easy to monitor the patients that are admitted in their hospitals. We all live in the world of technology and rat race where everybody is indulged in. For our work we live in a world in which we need fast working machines and technology based devices which can speed up our work for our hectic schedule.

Thus, these systems are used in various applications such as symptoms detection, emergency systems and hardware for health monitoring systems. Due to further advancements in the technology, elderly population has been increasing due to good health medication facilities, better technology and even vaccinations that has been discovered all over the world.

This paper is generally a small survey where people are given particular options just to get us know that what are the facilities they are familiar with in their hospitals be it in either villages, towns, city, district or state. This survey generally tells us about the priority of people making the good use of facilities or machines which are being given by hospitals no matter the hospital is either private or controlled by state government.



METHODOLOGY

In this paper we applied a certain plan or methodology to take this survey throughout our district or state and from people of other states also.

To figure out the questions that are needed for the survey.

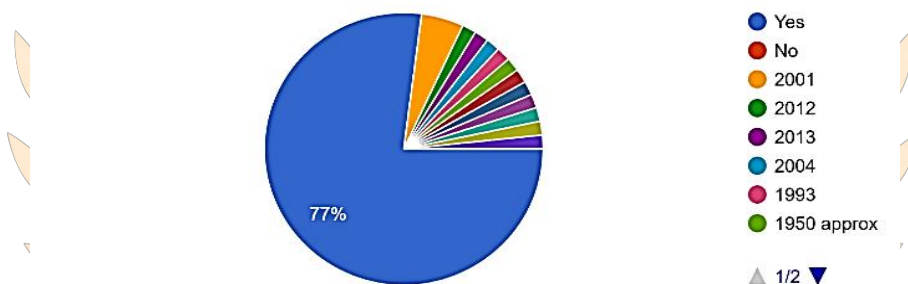
1. To set a limit of people among which survey can be taken.
2. Formulation of questions related to survey that are public oriented.
3. Distribution of the forms on online basis to the people.
4. Calculation and observation of result regarding the people feedback.

RESULTS AND DISCUSSION:

After the survey has been taken in online mode through google forms we got the results in the form of pie charts regarding the opinion of various persons. The discussion and interpretation of the results corresponding to each question has been done here.

1. Do you have any hospitals in your city?

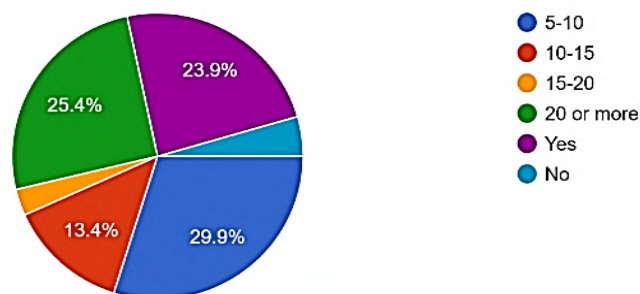
61 responses



From the graph its clear to us that 77% of the people have hospitals facilities in their particular district or state. Some of them have even responded to the institutional setup year of the hospitals in their states and from tha analysis we got that most of the hospitals were setup mostly in the year 2001.

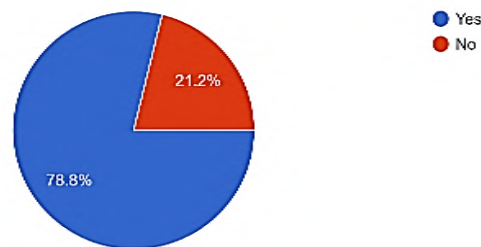
2. How many government and private hospitals are there in your city?

67 responses



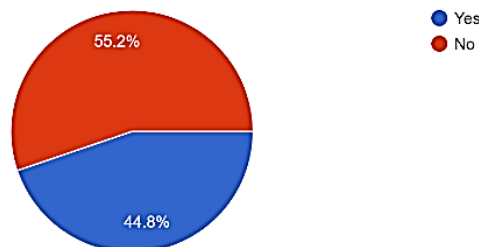
Our next question is related to how many government and private hospitals have been present in a particular states or district and finally came to know that there are mostly government hospitals preferred by the public in comparison to private hospitals. The main factor of preference of govt hospitals over private institution is that their pricing and expenses. And 25.4% population have more than 20 hospitals in their state. Thus it is clear that maximum population have hospital facilities in their state.

3. Have you seen ECG machine in your hospital?
66 responses



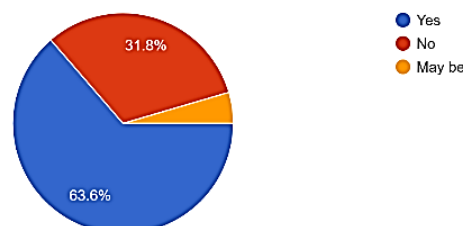
From our chart its clearly visible that 78.8% of the people have seen ECG machines in the hospitals and 21.2% are such those who haven't seen the machines in the hospitals. Either, they don't know or must have not seen this machine.

4. Have you ever used the ECG machine advised to you by the doctor?
67 responses



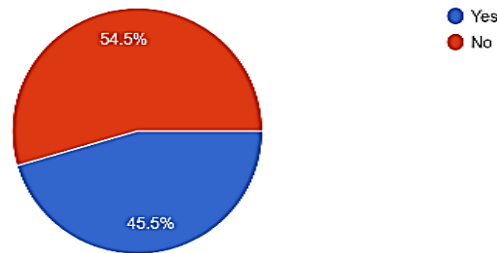
Our next questionnaire is related to the use of ECG(Electrocardiogram) machines by the people advised to them by the doctor and we infer from the above data that 55.2% people have only used the ECG machine while 44.8% are such that haven't used this machine.

5. Have you seen MRI machine in the hospital?
66 responses



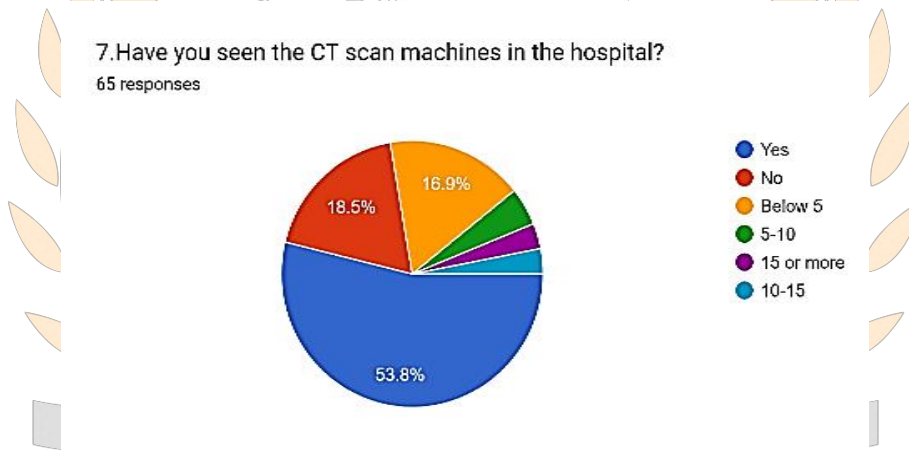
Our next question was whether people have seen MRI (Magnetic Resonance Imaging) machine in the hospital. So it is clear that 63.6% people have seen this machine in the hospital while 31.8% people have not seen this machine and 4.5% people are such that have seen the machine but they are not confirmed about whether this is an MRI machine or not.

6. Have you ever used the MRI machine advised to you by the doctor?
66 responses



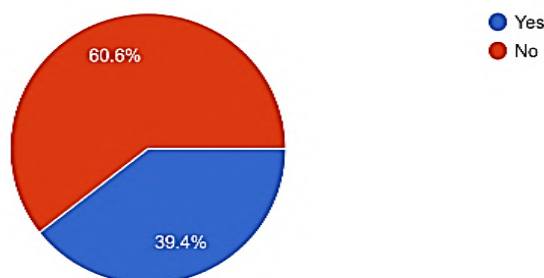
From the graph we have a clear conclusion that 54.5% people have used the MRI machine advised to them by the doctors while 45.5% people have not used it.

7. Have you seen the CT scan machines in the hospital?
65 responses



From the pie chart it is clear that 53.8% people have seen the CT scan machine while 18.5% haven't seen it.

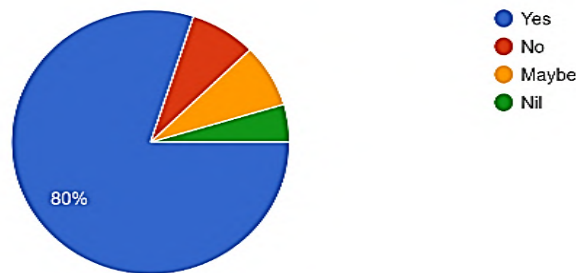
8. Have you ever used the CT scan machines advised to you by the doctors?
66 responses



From the pie chart it is clear that 39.4% of people have used the CT scan machine while 60.6% haven't used it. Thus, we can conclude that maximum of the population haven't used this facility in their hospital.

9. Have you seen the Pathology labs in the hospital?

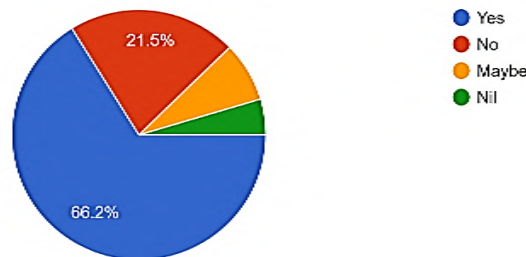
65 responses



From the pie chart it is clear that 80% have seen the pathology labs in the hospitals while 7.7% have not seen it. Some 7.7% are confused whether they have seen these labs or not while 4.6% haven't responded any for this question. Thus it's the conclusion from the analysis that most of the people are familiar with the use and the availability of pathology labs.

10. Have you used the pathology lab facilities in the hospital advised to you by the doctor?

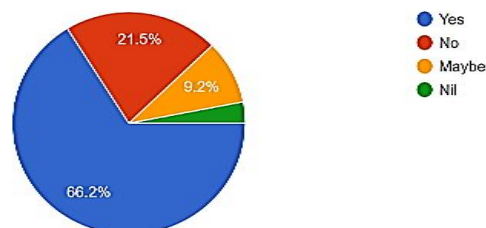
65 responses



From the above recorded responses it is quite clear that 66.2% people have used the pathology labs for the various tests advised to them by the doctors while 21.5% are such who haven't used these labs. Some 7.7% are such who have used these but they are not confirmed whether these are pathology labs or not while 4.6% haven't responded to this question.

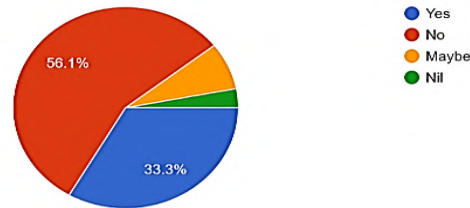
11. Have you seen ICU in hospital?

65 responses



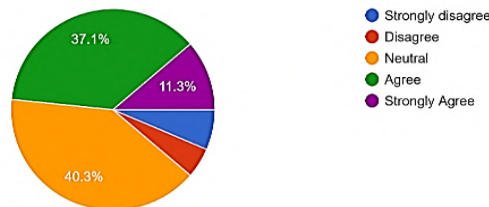
From the above pie chart diagram, it is clearly concluded that 66.2% people have seen the ICU machines in the hospitals while 21.5% people haven't seen it. Apart from these 9.2% people are such that have seen this machine but they aren't confirmed about it whether the machine is called ICU (Intensive Care Unit).4.6% people haven't responded to this question.

12. Have you used the ICU facilities advised to you by the doctor?
66 responses



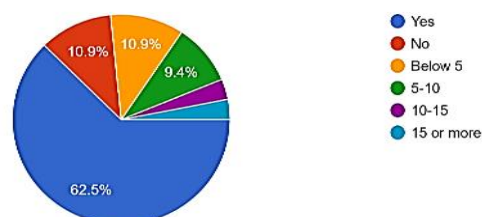
From the analysis it is inferred that ICU as we all know is used in the case of some critical accidents or disease and from the result it is clear that the maximum population 56.1% haven't used it. Only few people about 33.3% people have used these facilities advised to them by the doctors in the case of medical emergencies. 7.6% people are such who have used it but they aren't confirmed about it whether the machine they are using is ICU or not while 4.6% haven't responded to it.

13. What is your opinion regarding the ICU facilities given to the patients by hospitals?(Are they up to the mark or not)
62 responses



Our next question was the opinion of people regarding the satisfaction from the facilities which they are given to them by the hospitals regarding ICU and it is concluded that 37.1% people are quite satisfied with these facilities. And 11.3% are such that they are very strongly satisfied with these facilities whereas 40.3% people are such that they have used these facilities but neither they agree nor they disagree with the satisfaction factor from these facilities.

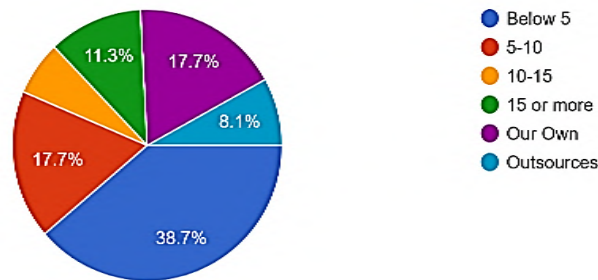
14. Have you seen operation theatres in hospitals?
64 responses



The next analysis of our question is regarding the people have seen the operation theatre in hospital or not and from the result it is clear that 62.5% people have seen the operation theatre in their medical institutes while 10.9% people haven't seen them.

15. How many operation theaters are there in the hospital?

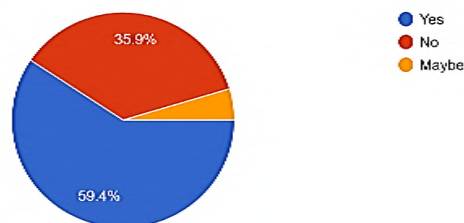
62 responses



Our next question is to know about the number of operation theatres an institution is having and it is clear from the results that 38.7% hospitals have less than 5 operation theatres, 17.7% of the hospitals have nearly 5 to 10 operation theaters, 6.5% have 10 to 15 operation theatres, and 11.3% have 15 or more operation theatres in their hospitals.

16. Are you satisfied with the cleaning facilities present in the hospital/institutions?

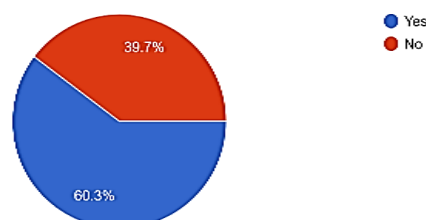
64 responses



Our next question was regarding the satisfaction of people to the cleaning facilities present in the hospitals and we found out that 59.4% people are satisfied with these facilities whereas 35.9% people are not satisfied with this facility that they are given by the hospitals whereas 4.7% are such that they have seen and observe the cleanliness in their medical instituti

17. Do they have incineration (waste disposal management system) facilities in the hospital/institution?

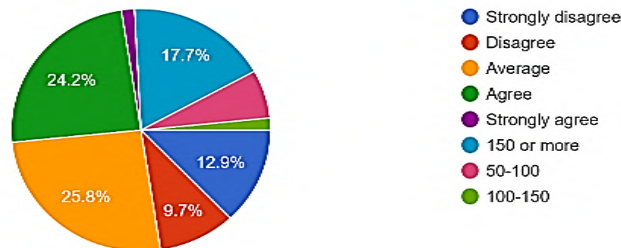
63 responses



The next question is regarding the waste disposal management systems in the hospitals and we found out that incineration facilities in 60.3% hospitals are up to the mark and they were good while 39.7% hospitals are such that they don't have proper incineration facilities.

18. Are you satisfied with the incineration facilities present in the hospitals?

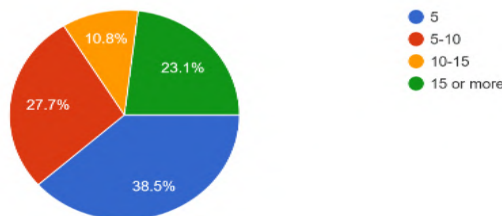
62 responses



The next question is about the satisfaction of people regarding the incineration facilities in the hospitals and we found out that though many hospitals have incineration facilities but only few percentage of people are satisfied with such and maximum people have neither satisfaction regarding this. From the result it is clear that 24.2% people are in the agreement of facilities regarding incineration, 25.8% people have an average opinion to such while 12.9% people are in the strong disagreement regarding cleanliness of hospitals.

19. How many ambulances are there in the hospital?

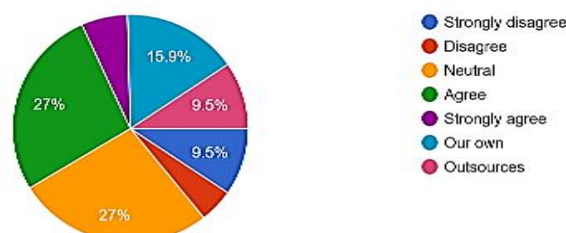
65 responses



The next question is regarding the number of ambulances hospitals have. We found out that 38.5% hospitals have only 5 ambulances in this hospital, 27.2% have up to 5 to 10, 10.8% have 10 to 15 ambulances and 23.1% have only 15 or above. Thus, it can be inferred from the diagram that maximum number of hospitals have less number of ambulances due to which they might be facing problems regarding the movement of patients from one place to another in emergency cases.

20. Are you satisfied with the ambulance facilities that has been provided to you by the hospital?

63 responses

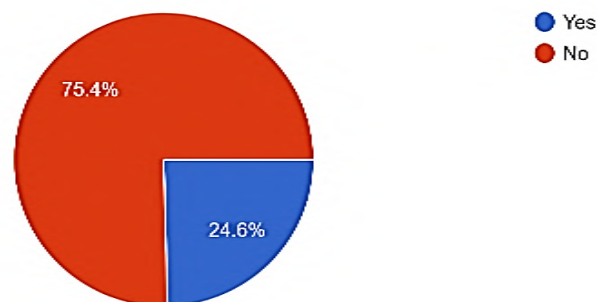


Next question is regarding the satisfaction from ambulance facilities given to the patients and thus we found out that only 6.3% have strong satisfaction about these facilities in comparison to the other people. 27% people only agree with these while 9.5% people are in strong disagreement with these facilities provided.

Next question comes about security of the patients suffering from various disease that visits the hospitals. So from the survey we conclude that 38.1% people are satisfied with the security purposes of the hospitals whereas 31.7% are such those who have seen the facilities but they aren't confirmed whether they are satisfied with these or not. Only 6.3% people are in strong agreement with these facilities.

22. Whether patients family members are allowed to enter in ICU or not?

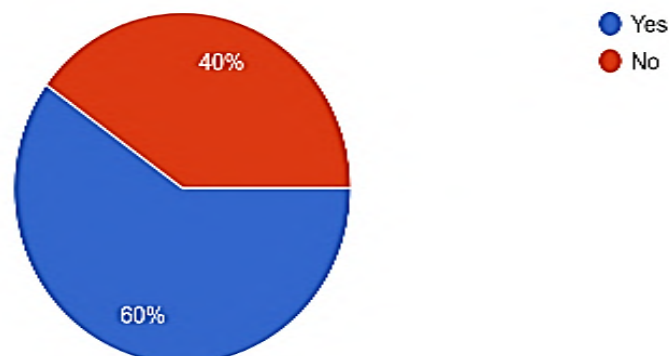
61 responses



Our next question was whether the families are allowed to enter in ICU or not. From the results it is clear that most of the hospitals i.e. 75.4% doesn't allow family members to enter in while only 24.8% hospitals only give permission to family members. Thus, we conclude that mostly hospitals doesn't allow the entry of other members rather than patient and medical staff.

23. Do they have 24x7 trauma care facilities in their hospital?

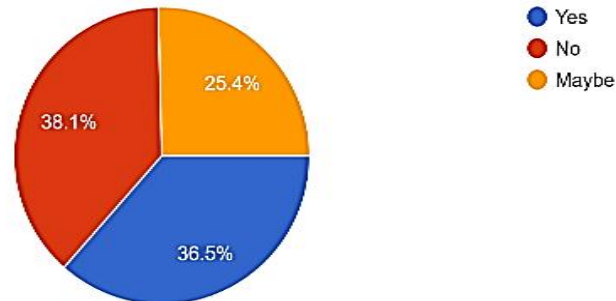
60 responses



The next question is related to trauma care facilities and we conclude that 60% hospitals have such facilities in their institutions while 40% doesn't have this facility at all.

24. Are you satisfied with the food given to the patients?

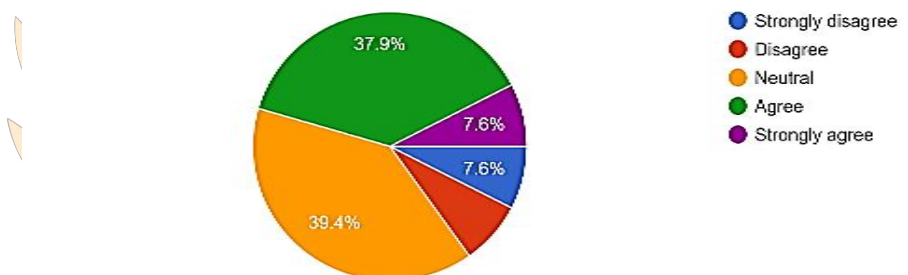
63 responses



Apart from all such facilities the next question which we formulated is related to the food facilities that are given to patients and we found out that 38.5% people are agreed that food given to the patients are of good quality while 38.1% people have the opinion that food quality is not good while 25.4% are in a confused state about the facilities of the hospital. Thus we conclude that maximum percentage of people are not satisfied with the food at all.

26. Are you happy with the behaviour of staff of the hospital?

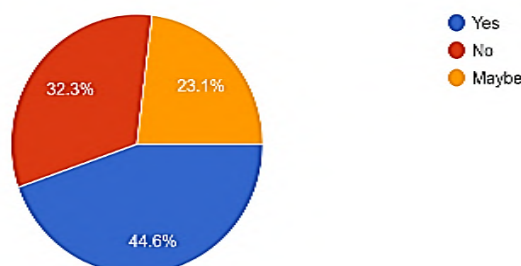
66 responses



The next question is about the behaviour of the staff with the patients and 39.4% people are somewhat satisfied and somewhat not with the behaviour of the staff whereas 37.9% are satisfied with the good behaviour of the staff while 7.6% are totally disagree with the opinion that the staff behaviour is upto the mark. Thus we see that the staff behaviour is a concern among the people from the hospital authority.

27. Are you happy with the charges they provide you for the treatment of diseases?

65 responses





Lastly, we asked the question whether the people are happy with the charges of the test advised to the patients by the doctors and we concluded that 44.6% people are in agreement with the charges while 32.3% people are disagreed with the charges fixed by the hospitals and 23.1% are in a confused mindset whether the charges available for them are ok or not. Thus, we conclude that maximum people are satisfied with the charges.

Thus such 27 questionnaires were formulated and 67 people who responded to them were recorded in the form of pie chart presentation and we finally came to a conclusion that maximum people use the facilities present in the hospital and they are happy with the outcomes of the results of these facilities. Thus, our motive for this questionnaire survey was to get a clear idea of the use of embedded systems that we know are present in the hospitals and are generally used by the people in the hospitals.

CONCLUSIONS

From the above questionnaire we come to know about the following facts listed below:

1. People generally prefer government medical institutions in comparison to the private firms due to easy availability and economic reach of the persons on the basis of their annual incomes.
2. For the people dwelling in cities and towns familiarity of them with the machines such as ECG, MRI, CT Scan etc are quite good but for the village people as they don't have a clear knowledge about such machines due to the lack of facilities in their areas.
3. Thirdly we evaluated that the maximum number of hospitals don't have sufficient ambulances due to which patients have to face problems sometimes during an emergency conditions.
4. Some of the hospitals don't allow family members to enter in the intensive care units while only few hospitals are there which allow such permission to patient family members.
5. In most of the places people aren't satisfied with the food also that is being provided to the patients. Thus, hospitals should focus on the food preparation and the cleanliness in their mess area to provide healthy nutrition to the patients along with the medication.
6. Next, people found the behaviour of the medical staff with them is sometimes good but sometimes it is not good experience at all. Thus mostly people have their mixed opinion about the behavioural experiences they had with the staff.
7. Finally, people are satisfied with the charges hospitals provide them for certain test advised to the patient by the people but we observed that on one hand people agree with the certain expenses but on the other hand they too disagree with the charging procedure of the institutions. Thus hospitals should maintain a clear chart which is convincible to all the economic status of the people.

Thus, these are the certain conclusions which we found out from our above survey. Most of the people which took part in the survey are mainly doctors, faculty members, professors, students and various other people.

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