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IoT Devices to Improve Health of Diabetes Patient

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***Abstract*—**Internet of Things (IoT) technologies square measure utilized in several areas, like intelligent transportation, smart city, hospital, games, healthcare. This paper presents a review of the most recent devices supported web of Things that square measure used for polygenic disease. polygenic disease may be a cluster of metabolic diseases within which there square measure high blood glucose levels over a chronic amount. Semi permanent polygenic disease care needs involvement from patients additionally as doctors and family caregivers. With speedy advancements in wireless and net technologies, variety of devices supported web of Things are planned for regulation of polygenic disease.

Most of those IOT devices target patient observance and technology-based deciding. we have a tendency to analyze the operating of those latest devices and discuss the main problems and challenges moon-faced by them.

I. INTRODUCTION

The use of IoT in healthcare equipment increases the quality of care, service quality and efficiency, which will bring increased value, particularly for the elderly and patients with diabetes long-term illnesses. The use of IoT in patient care and monitoring is becoming more frequent, with the goal of improving the patients' quality of life.We feel that most of the existing IoT solutions discussed in this paper will improve the quality of life for diabetic patients by decreasing hospital visits, providing a better picture of their overall health, and enhancing communication between healthcare workers and patients. Patients may also use the solutions to keep track of their food and exercise levels, which is a crucial element of diabetes management. Healthcare professionals will be able to obtain real-time data on their patients thanks to the use of IoT devices, making it easier to administer the proper medication, intervene, and build the right treatment plan. Diabetes patients ranging from 18 to 79 are predicted to number 74.2 million in 2021, climbing to 124.8 million in 2045.

II. LITERATURE REVIEW

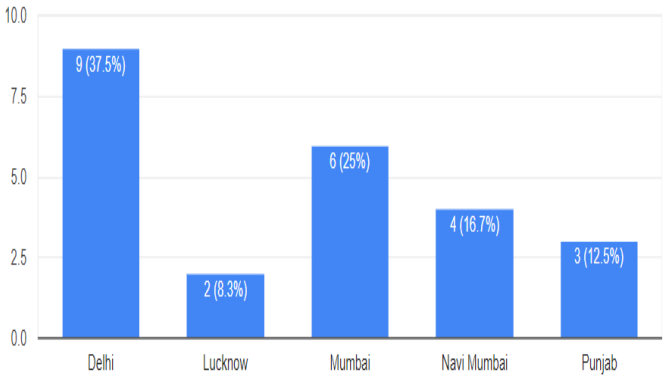
Most systems can be offered in a Web-based or online format due to advancements. Today, the Internet of Things has transformed our lives by promising more, and its principles are already being used to improve access to care, raise quality, and lower costs .

From the standpoint of end-users, particularly patients, the usage of the Internet for various health-care-related purposes. Collecting real-time data is critical in the field of healthcare. As a result, this research introduces. As a result, this research introduces a non-invasive and IoT-driven diabetes monitoring system.

III. RESEARCH METHODOLOGY

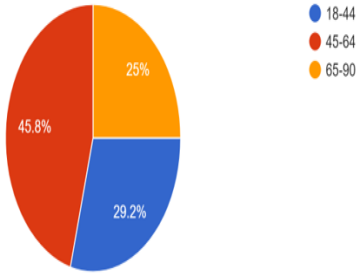
A systematic review approach has been used to review the existing literature on IoT in healthcare with a focus on diabetes-related solutions for this research. The terms "Internet of things," "IoT," "Healthcare," and "diabetes" were used in combination. Other keywords that were utilized included "patient monitoring," "CGM," "RFID," and "Challenges Other method to cure diabetes without IOT devices.We had conducted a survey for diabetes patients based on -

According to Location



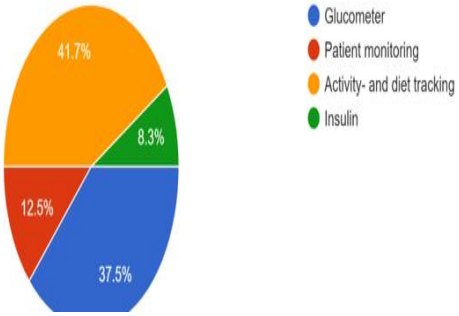
As a recent survey conducted by us High prevalence of diabetes is reported in economically and epidemiological advanced states such as Delhi, Mumbai, Navi Mumbai and Punjab.

According to Age

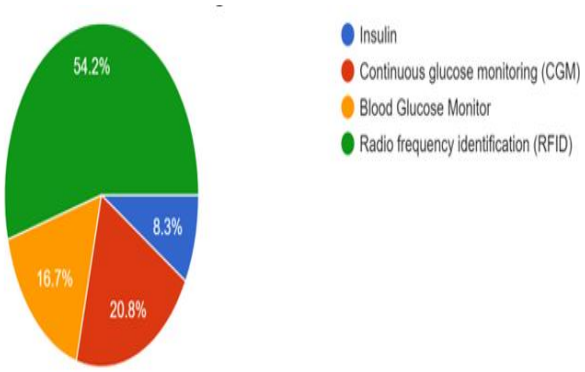


As we see in a graph over 40% of locality of age between 45 and 64 has been facing diabetes disease in recent years whereas over 20% people of age between 18 - 44 and 65 – 90 India has an estimated 77 million people (1 in 11 Indians) formally diagnosed with diabetes, which makes it the second most affected in the world, after China.

Furthermore, 700,000 Indians died of diabetes, hyperglycaemia, kidney disease or other complications of diabetes in 2020. One in six people (17%) in the world with diabetes is from India. (India's population as calculated in October 2018 was about 17.5% of the global total. The number is projected to grow by 2045 to become 134 million per the International Diabetes Federation.

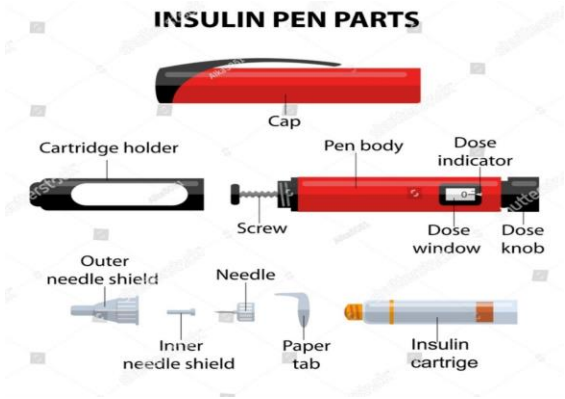


As a recent survey with this graph we can clearly see lot of people still don't know about insulin so we will give a proper picture to people with this research paper. Only 8.3% of people are using insulin for diabetes. Glucometer is more popular than insulin as we can see 37.5% are using it. 12.5% of people are treating by patient monitoring. 41.7% of people are using Activity and diet tracking for diabetes.



One more IoT device use more from the above graph Radio frequency identification (RFID) technology uses radio waves to transfer data from an electronic tag attached to an object, with the purpose to identify and track the object with the infrastructure.

Working and use of Insulin Pen



An insulin pen is an injection device that is about the size and shape of a magic marker. It delivers insulin into the fatty tissue below the skin (usually in the arm, thigh, or stomach) via a short, thin disposable needle.

1. If using a new pen, remove it from the refrigerator 30 minutes before use.
2. Check the expiration date and that the insulin is the correct type and strength.
3. If necessary, insert a new cartridge into a reusable pen.
4. Mix the insulin by gently rolling the pen between the palms of the hands.

5. Tilt the pen up and down, until the insulin is clear and smooth.
6. Wash hands thoroughly.
7. Remove the pen cap, and clean the top with alcohol.
8. Firmly attach a new needle to the pen.
9. Remove the needle caps while retaining the outer cap.
10. Turn the dial to the correct dose.
11. Double-check the dose before injecting.
12. Clean the chosen injection site with alcohol, and allow the area to dry.
13. Do not inject into areas that have wounds or bruising.
14. If possible, vary the injection site to avoid lumps or swelling.
15. Hold the pen to the injection site, being sure to following any instructions on the packaging.
16. Press the injection button.
17. Wait for 10 seconds before removing the needle from the skin.
18. Press on the injection site for 5 to 10 seconds, but do not rub the skin.
19. Remove and safely dispose of the needle.
20. Replace the cap on the pen

.

IV. Future Enhancement

IoT can make healthcare cheaper and efficient in the future. It can help in the creation of more customized and patient-oriented equipment. Moreover, IoT will also enable patients to get better access to data, personalized care; thus, leading to fewer visits to the hospital.We can consider an IoT unit as a device with a sensor that can interact with the physical world and send information to the Internet. All these Iot based healthcare devices can communicate with each other to take important actions that would provide timely help or even save a life.

Through this review, we have a tendency to known that there's a research gap on privacy and security considerations associated with IoT in tending, which the analysis is a lot of targeted towards IoT applications and devices. we can take into account Associate in Nursing IoT unit as a tool with the sensing element that may act with the physical world and send data to the net. of these IoT primarily based tending devices will communicate with one another to require necessary actions that will offer timely facilitate or perhaps save a life.

After grouping passive knowledge, IoT tending devices would send this essential data to the cloud in order that doctors will affect it. Thus, IoT-based tending services not solely only improve a patient's health and facilitate in essential things however conjointly the productivity of health workers and tending organization's workflows.

Future Challenges of IoT in Healthcare

With the increase in the market for healthcare IoT, the challenges are bound to increase. Storing mountains of data collected by many devices will pose a challenge to the healthcare institutions. As this data will also be exchanged amongst other devices, the security issues will also rise. Unauthorized access to connected devices can cause harm to the patient's safety. Thus, proper authentication and authorization will be necessary to achieve success with IoT.

V. Conclusion

In the future, as IoT devices are expected to become more effective in healthcare facilities, we will see these next-generation IoT devices bring embedded intelligent healthcare services as part of their offerings.IoT changes the way the facilities are delivered to the healthcare industry. These technologies improve the product, causing a larger effect by bringing together minor changes.

Today insulin pen are very useful as people can see it in real life also we have worked on questions to make a feedback form survey so that we can know how important theses iot devices in real life. This paper discusses some of the activities that can be improved and simplified by using IoT in the therapy of diabetes patients.

VI. References

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