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Wearable Technology in Combination with Diabetes

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***Abstract*: AI applications in healthcare has the primary aim of analysing the relationship between prevention or treatment and patient outcomes. AI not only helps in the prediction of a treatment but also assists in the operational activities like: cost saving, improving the level of satisfaction rates in patients, staffs and many more.**

Wearable technology are basically the small electronic devices that can be worn by the people as an accessory which are used as the activity trackers that helps to exchange data through the internet with the manufacturer, operator or other connected devices; without requiring human intervention.

India is referred to as the diabetes capital in the world. Diabetes mellitus commonly known as diabetes is the group of diseases that result in too much sugar in the blood.

The main objective of our paper is to relate the wearables with the diabetes. As we all know that wearables help in recording of the data related to Blood Pressure, the number of steps a person walk and many other co-related data that are essential for a diabetic person.

These data would be recorded in the patient's database and would be used by them in-order to know regarding their physical fitness. Along with the patients the Endocrinologists can also fetch the benefits from wearables. They can also access the data recorded in the wearables on patient visits which indeed will help physicians to understand the situation much better.

***Keywords*: wearable technology**

1. Introduction

Artificial Intelligence are also referred to as Machine Learning is basically the intelligence demonstrated by the machines, in contrast to the natural intelligence displayed by humans.

Moving towards the healthcare setup the artificial intelligence in healthcare is the use of complex algorithms and software to estimate human cognition in the analysis of complicated medical data. The primary aim of AI in healthcare setups are to analyze between prevention or treatment and most importantly the patient outcomes. AI related programs have already been developed and are being practiced in the diagnostics processes, treatment development protocol, drug development and may others. There are many medical institutions like- Mayo Clinic, Memorial Sloan and many more that have already developed the AI algorithms for their departments.

Wearable technologies are the smart electronic devices that have been incorporated into clothing or worn by the human beings as accessories. Wearable devices act as the activity trackers and also assists in the exchange of data with the help of internet to the manufacturer, operators and many more without any human intervention.

Diabetes also referred to as Diabetes Mellitus is a group of diseases that results in too much sugar in the blood. Following are the types of diabetes:

- TYPE 2 DIABETES: It is a type of diabetes that affects the way the body processes sugar.
- TYPE 1 DIABETES: It is referred to as a chronic condition in which the pancreas of the body produces little or no insulin.
- PREDIABETES: It is a condition in which blood sugar is high, but not that high to become Type-2 Diabetes.
- GESTATIONAL DIABETES: It is referred to as a form of high blood sugar that affects the pregnant women.

Among above the most common form of diabetes is Type-2 Diabetes. We have chosen this study because India is referred to as "Diabetes Capital of the World" with the current rate of 50.9 million people suffering from diabetes and is expected to increase up-to 80 million till 2025.

Now coming towards the relationship between wearables and diabetes there is a code that – "The Diabetes Epidemic is Driving Med Tech Companies to develop Wearable Devices to manage the condition".

The diabetes epidemic is helping to create opportunities for diabetes device manufacturers to develop devices that automatically monitor blood glucose and deliver appropriate insulin doses. The most popular form of wearable devices to monitor blood glucose have been the Continuous Glucose Monitoring (CGM) device that sticks to the skin to continuously monitor the blood glucose 24/7.

Following are the CGM that have received the FDA (Food and Drug Administration) approval recently:

- *Eversense Glucose Monitoring:* This system consists of an implantable fluorescence-based sensor that provides real time glucose monitoring every 5 minutes for up-to 90 days at a time. It also provides alert to the patient's compatible mobile device.
- *Guardian Connect System:* This system measures glucose level at every 5 minutes and display the value through the Guardian connect app installed in the compatible mobile

device. With the help of this device the user can detect trends and track the patterns in glucose concentrations to help in keeping the blood glucose level in a safe range.

- *Dexcom CGM System:* This system helps in determining the blood sugar level in children aged two and older and adults with diabetes. This is the first type of CGM system permitted by FDA that may include insulin dosing system, insulin pumps, blood glucose meters or other electronic devices that can be used for diabetes management.

There are further many devices too from which the data can be accessed both by the patient and the treating physician for proper monitoring of the diabetes.

So, in this way wearables can be helpful for diabetes management.

2. Methodology and data compilation

The research design used here is descriptive and the data collection approach is Quantitative in nature. The data collection method is secondary in nature as no primary study has been conducted for the same.

- India is referred to as the Diabetes capital of the world with 50.9 million people suffering from diabetes tending to increase up-to 80 million by the year 2025.
- The most common form of diabetes is type-2 diabetes.
- The current scenario of diabetes in India compared to other countries is shown below in the data below

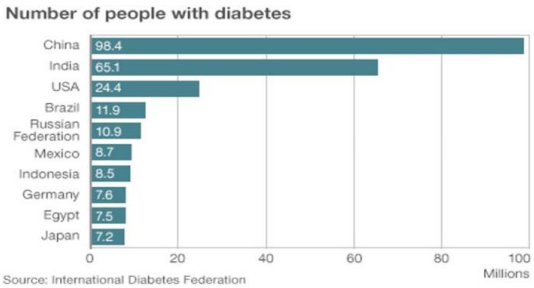

Fig. 1. Number of people with diabetes

- The global usage of wearables is shown in the data below which helps us in understanding the increase rate of using wearables.

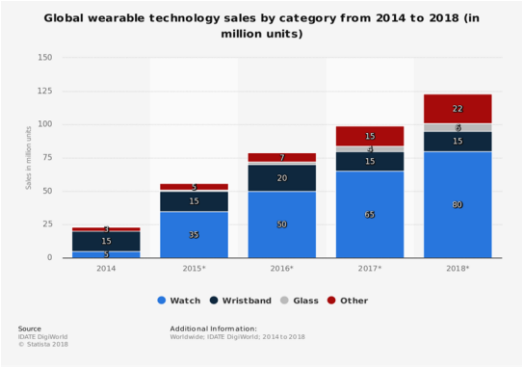

Fig. 2. Global wearable technology sales by category from 2014 to 2018

- In the data below it is showing the data regarding the usage of wearables in India which is showing an increasing trend.

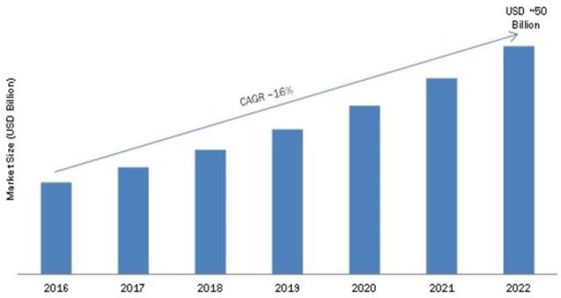

Fig. 3. Usage of wearables in India

So, from the above data it is clear that the uses of wearables are increasing not only in the world but also in India too. And India is as the Diabetes capital of the world so wearables can help the diabetic person to regularly observe the body's basic vitals which will be very helpful for them.

3. Results

From the above data we can easily draw an insight that the people in India is accepting the new technology and is moving at a faster pace towards the technological developments. As a result of it the Artificial Intelligence technology is gaining much more importance in healthcare too like: Robotic surgery, people of using smart watches for controlling their basic vitals etc. The people who are diabetic in nature can easily have control on their sedentary lifestyle with the help of wearables as they help in providing data for the same which indeed can be useful for the patient to understand where they are lacking behind and will be even useful for them as a data storage area. The patients can also use that data while having consultation with the Endocrinologist and can show them in need for any other medication services.

4. Conclusion

So, at last the conclusion that can be drawn from the entire study is that diabetes cannot be cured but can be administered by the wearables that are being used and it would also give contribution for data storage device. It is required by the patients of diabetes who are economically sound to have regular usage of wearables as they help in regular monitoring of the body vitals which is the must for any diabetic person.

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