

Remote Health Monitoring Patients with Hypertension

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1 BACKGROUND AND SIGNIFICANCE

Hypertension is a condition in which blood pressure against the artery walls is too high (“High blood pressure (hypertension)”, 2018). About half of Americans suffer from hypertension - leading to a burden in the United States healthcare system (“Hypertension Prevalence in the U.S.”, 2020), costing about \$131 billion nationally, including hospital admissions (Hoffman, 2018). Remote health devices and patient tracking are the future of the medical industry. It will help optimize resources, improve patient health outcomes, and lower healthcare costs.

1.1 Problem

Hypertension causes several threats such as stroke, vision loss, heart failure, heart attack, kidney disease/failure, sexual dysfunction, etc. to people who suffer from it (“Health Threats From High Blood Pressure”, 2016). The condition can damage a patient’s body for years before symptoms become prominent (“How high blood pressure can affect your body”, 2019), so that doctors must monitor their patient’s blood pressure regularly. Treatment and lifestyle changes can help control blood pressure. However, hypertension is a difficult condition to diagnose with a few doctor visits. White coat hypertension is when a patient’s blood pressure is elevated only at the doctor’s office but not in other settings. Monitoring a patient’s blood pressure regularly while they are at home could help doctors give a more accurate diagnosis (“6 Facts About High Blood Pressure”, n.d.).

1.2 Proposed Idea

Doctors can monitor their patient’s blood pressure throughout the day (remotely). Doing so will help reduce the risks of complications. For my idea, I am assuming an IoT blood pressure monitor and application (to retrieve data from the monitor) has been provided to the patient. Utilizing the data captured from a Bluetooth blood pressure monitor, I will create a web application portal for doctors to monitor and analyze their patient’s health. Doing so will help me display the benefits of remotely monitoring a patient’s health. The portal will include analytical visuals of the patient’s blood pressure data and show the trends over time.

1.3 Complexity or Effort

Since remote patient health monitoring is relatively new to the healthcare field, there will be limited resources to explore. It will also be more challenging to find a dataset to create my web application - also, due to HIPAA laws, this data might not be available to begin with. I will continue to explore datasets with daily patient systolic and diastolic readings. If I cannot find a dataset, I will create my own dataset inspired by clinical data to help showcase my proposed idea. It will take a lot of effort to analyze and visualize the data to be useful for doctors in a real-world setting. Also, I need to make sure my web application is scalable as doctors will have varying numbers of patients. Since I am dealing with sensitive health data, my web application will also need to be secure to be HIPAA compliant; I will need to explore different security protocols that I need to implement. I am considering using Tableau dashboards to visualize the data while using HTML, CSS, JavaScript to create the web application. I am exploring other technologies that would help me build my web application to meet my goals and standards. If time permits, I would like to showcase how doctors can utilize my web application with other medical conditions.

2 REFERENCES

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