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Modern Dehydration Monitoring System

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ABSTRACT: Dehydration happens in our body, when more water and fluids leave than the water we consume. Dehydration is more normal during pregnancy than at different occasions. Although most cases of dehydration in pregnancy are mild, severe dehydration can be dangerous for both the mother and the baby. The baby puts a lot of demands on the body, therefore pregnant women need to eat a lot of extra nutrients and drink a lot of water. Morning sickness, like conditions that induce excessive vomiting, can contribute to dehydration. When dehydration becomes severe, thirst feelings may disappear. Dizziness and disorientation, a beating heart, and changes in the baby's rhythmic are all signs of more significant dehydration during pregnancy.

KEYWORDS: Dehydration, Pregnancy, Water sensor, Temperature sensor, Fall Detection, Microcontroller, Alert System.

I. INTRODUCTION

Dehydration occurs when you use or lose more fluid than you take in, and your body doesn't have enough water and other fluids to carry out its normal functions. If you do not replace lost fluids, you will get dehydrated. Anyone may become dehydrated, but the condition is especially dangerous for young children and older adults. We created a Modern Dehydration monitoring system for pregnant women and children. It is design based on 3 sensors. The three sensors are fall detection sensor, temperature sensor, sweat sensor. Due to dehydration Sometimes dehydration occurs for simple reasons: You don't drink enough because you're sick or busy, or because you lack access to safe drinking water when you're traveling, hiking or camping. Diarrhea, vomiting. Severe, acute diarrhea that is, diarrhea that comes on suddenly and violently can cause a tremendous loss of water and electrolytes in a short amount of time. If you have vomiting along with diarrhea, you lose even more fluids and minerals. Fever. In general, the higher your fever, the more dehydrated you may become. The problem worsens if you have a fever in addition to diarrhea and vomiting. Excessive sweating. You lose water when you sweat. If you do vigorous activity and don't replace fluids as you go along, you can become dehydrated. Hot, humid weather increases the amount you sweat and the amount of fluid you lose. Increased urination. This may be due to undiagnosed or uncontrolled diabetes. Certain medications, such as diuretics and some blood pressure medications, also can lead to dehydration, generally because they cause you to urinate more. The sensors can detect the causes of the dehydration and do precautionary measures like buzzer sound to indicate it

II. RELATED WORK

The dehydration monitoring device in earlier was developed as NON-INVASIVE POSSIBILITY OF BODY DEHYDRATION MONITORING. This method is used To control water loss process in human body, special measurement equipment was built in our laboratory consisting of following items: i) personal scales for body weight measurement, ii) humidity sensor based on nanostructured titanium dioxide layer [5] for monitoring of water loss through the skin, iii) combined ions selective electrode for controlling of K⁺ ion concentration in the urine iv) data collection. Another related work that has been developed is Non-Invasive Skin Hydration Level Detection Using Machine Learning. It considers the hydrated and dehydrated amount in people of standing and sitting. Data is collected from five subjects in this research. Data of subjects are collected in two scenarios classified as hydrated and dehydrated. Moreover, data is also categorized based on physical postures sitting, standing and lay down. Data is recorded at a resolution of 16 bits in samples of 5 min to 15 min and the sampling rate is 1 MHz n. In this study, therefore, hydrated, and dehydrated state data is collected in two common body postures of sitting and standing. For a posture independent study, on the other hand, hydrated and dehydrated state data collected in both postures is combined and fed to a model that is unaware of the body posture. The future work that can be implemented is Dehydration monitor system for water loss controlling in human body was developed and fabricated. This system is based on measurements of relative humidity near skin to calculate water transport through the skin and measurements of potassium ions concentration in urea, which is a basic component of urine so is will be effective if added more sensors



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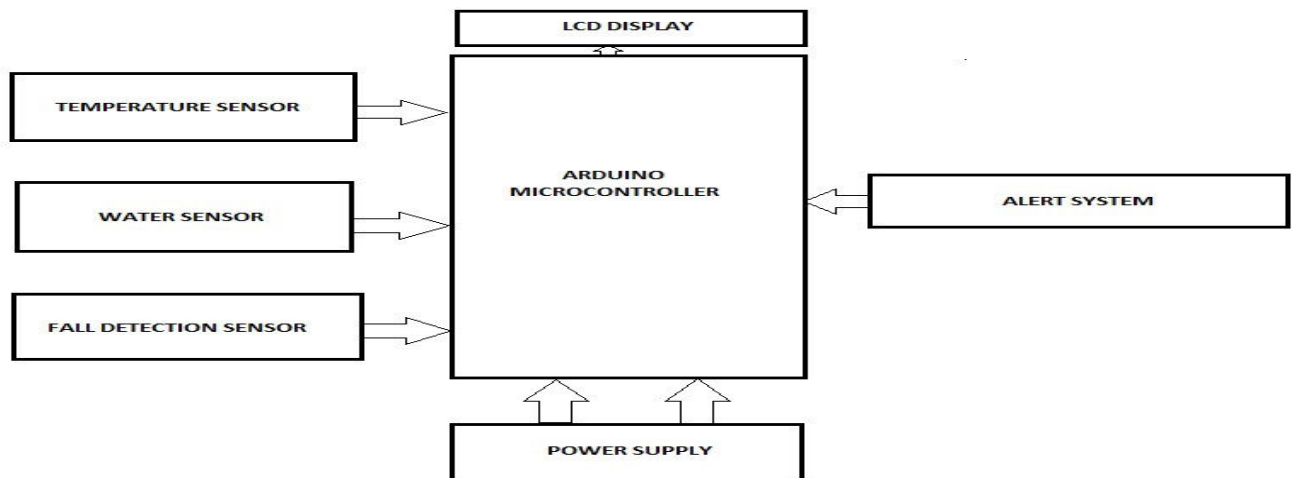
to detect the sweat and water level in the body and make it to display the amount to patient or user. Added to that it will be best to add some alarming indications to the patient that their body getting dehydrated and if not took the proper response action to the Warning make it indicate to the surrounding circumstances. These are the future implementations

III. METHODOLOGY

We have created a Modern Dehydration monitoring system for Pregnant Women and children to address this dehydration problem in pregnant women. We utilise an Arduino UNO, a power supply, a sweat sensor, Temperature sensor and accelerometer sensor for fall detection an LCD display, and embedded C software in this system. We will utilise a sweat sensor, temperature sensor and fall detection sensor to detect dehydration in pregnant women, which will be sent to the Arduino UNO, which will analyse the data and present it on the LCD display with alert system. The degree of dehydration and metabolic activity are constantly monitored by this system. Pregnant women can maintain their hydration levels and have appropriate fetal development with the aid of this device.

BLOCK DIAGRAM:

A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. there are many different types of temperature sensors. some temperature sensors require direct contact with the physical object that is being monitored (contact temperature sensors).



while others indirectly measure the temperature of an object (non-contact temperature sensors). Temperature sensor range above 37.8. Water sensor brick is designed for water detection, which can be widely used in sensing rainfall, water level, and even liquid leakage. Connecting a water sensor to an arduino is a great way to detect a leak, spill, flood, rain, etc. it can be used to detect the presence, the level, the volume and/or the absence of water. while this could be used to remind you to water your plants, there is a better grove sensor for that. the sensor has an array of exposed traces, which read low when water is detected. If the sweat level goes high it can indicate us to haptic sensor. The range of water sensor is above 60. Fall detection is a major challenge in the public healthcare domain. falls for the elderly can be especially serious, as they can lead to serious health issues. nowadays, fall detectors are commonly included in smartwatches, wearable fitness trackers, and other types of wearables. fall detection can also be done by a surveillance camera, also known as a computer-vision-based fall detection system. there are several kinds of fall detection methods and the algorithm each uses is what makes them unique and accurate. in most fall situations, the body leans to the side and touches the ground with high acceleration. so, an algorithm must detect a fall in these situations when there is a rapid change of position in a very short amount of time. It is an digital signal so that it if a person is falling it detection and indicate us through buzzer sound.



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IV. CONCLUSION

The modern dehydration monitoring system helps the pregnant women and children to indicate the state of dehydration and to alert others if they are in the condition of dehydration. The system is based on three sensors which makes the system effectively. The system also works for elderly people, sports players, field workers etc. The modern dehydration monitoring system is Portable, Low Power Consumption, Cost Efficient, Reliable.

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