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Modern Dehydration Detecting and Alerting System for Pregnant Women

N. Kripa[1], Dr. R. Gomalavalli[2], Oinam Robita Chanu[3]

[1]Research Scholar, Department of Biomedical Engineering, Bharath Institute of Higher Education and Research, Chennai - 73
[2]Assistant Professor, Department of Electronics and Communication Engineering, Siddharth Institute of Engineering and Technology, Andhra Pradesh
[3]Assistant Professor, Department of Biomedical Engineering, SRM Institute of Science and Technology, Chennai – 603203

Email: [1]Kripa.dd2@gmail.com

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 movement are all signs of more significant dehydration during pregnancy. A serious shortage of hydration can result in poor amniotic fluid production and organ malfunction, which can lead to the infant's growth being stunted. We created a Modern Dehydration Detecting and Alerting System for Pregnant Women to address this dehydration problem in pregnant women. We utilise an Arduino UNO, a power supply, a sweat sensor, an LCD display, and embedded C software in this system. We'll utilise a sweat sensor to detect dehydration in pregnant women, which will be sent to the Ardunio UNO, which will analyse the data and present it on the LCD display. 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.

Keywords: Dehydration, Sweat sensor, Simple, Digital module, Micro controller.

1. INTRODUCTION:

In this paper we proposed to design a system that can detect the level of hydration in patient. Dehydration happens in our body, when more water and fluids leave than the water we consume. But when the water level becomes very low than the usual it can cause headaches, lethargy, and constipation. It becomes recognizable after 2% of once typical water volume has been lost than usual.The harmony between liquid intake and liquid loss from the body is significantly unbalanced in dehydration. The seriousness of drying out goes from gentle to extreme, and lack of hydration can be deadly when liquid loss surpasses over 15% of the complete body water. Hypovolemia is characterized as diminished circulatory volume because of blood or plasma loss.

Block diagram

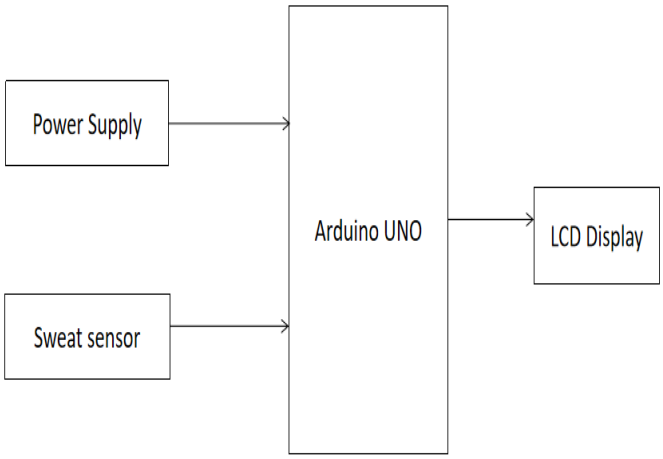

Fig.1 Block diagram

2. METHODOLOGY:

In this system the power supply which act as input for this whole setup. Here the power supply is used to convert the electric current from a source to the current voltage,frequency and current to the load.Here we will place a drop of sweat which is taken from the patient body and it is evenly spread in the sweat sensor. The sweat sensor senses and collects the data which act as input and the Arduino UNO which process the input data which is given as input and at last the output is shown in LCD display.First the value of power supply for this whole circuit is 12V.Here 3.3V is given and connected to the Arduino UNO as input and 2A input supply is given and connected to the LCD display as input and remaining 5V is given and connected to the sweat sensor as input.The sweat sensor collects data about the level of dehydration in the body and this data goes to the Ardunio UNO. The data gathered from the sweat sensor is processed by this Ardunio UNO, and the output value is shown on the LCD display by the patient. For further analysis of the data this can be connected to PC and the level of hydration in the patient is continuously monitored through LCD display and if the value goes abnormal than usual a mobile communication and also display alert is given to the patient.

3. MATERIALS

1. Power supply

Here, the power source is a controlled power source. The majority of electronic equipment requires uncontrolled AC to be converted into continuous DC in order to function. Within the power supply limit, the electrical circuits inside the devices should be able to deliver a steady DC voltage. If the supply from the main is variable and not adequately restricted, the electronic equipment may quickly break down.

2. Micro controller:

For this project we have used one of the popular microcontroller board called Arduino UNO R3. It is built on the technology of CMOS, and it requires very less power to operate. It has many types and models. We are using Arduino UNO R3 which is one of the kind of ATmega328P based microcontroller board in which it has the whole thing to hold up in the microcontroller. The board's primary characteristics are its availability in DIP (dual-inline-package), detachability, and ATmega328 microprocessor. This board's code may be simply loaded using an Arduino computer programme on the IDE platform.

3. Sweat sensor

This water level sensor module uses a sequence of equal presented steps to determine the water level by quantifying drops/water volume. Water level is exceptionally simple to monitor since the yield to simple sign corresponds to the water level. The ADC can be used to read the simple characteristics of this yield, and the Arduino's basic information pins may be used to connect it to the ADC.

4. LCD display

LCD stands for Liquid Crystal Display and as the name suggests it is the combination of two states of matter i.e., the solid and liquid state. It's an optically modulated electrical gadget that uses liquid crystals' light modifying capabilities. Because these liquid crystals are unable to emit light directly, they rely on the backlight to generate pictures. LCDs are used in various applications including laptop computer screens, TVs, instrument panels, cell phones, cockpit displays in aircrafts etc.,

4. RESULT

Modern Dehydration Detecting and Alerting System helps the pregnant women to maintain their hydration level.In this system the sweat sensor continuously detect the dehydration level and also the metabolic activity of the body,the collected data can processed through the Arduino UNO and output is shown in the display.It alerts the pregnant women to keep the body hydrated. This project is going to help for pregnant ladies to maintain their hydration level,healthier metabolic activity and to have proper fetal growth.Thus the patient can ensure their water balance level of their body through a digital module.

5. DISCUSSION

The project is used to monitor the dehydration level of the pregnant women. Water is required to build the placenta, which transfers nutrients to your developing baby throughout pregnancy. It's also present in the amniotic sac. Low amniotic fluid, preterm labour, birth abnormalities, and neural tube abnormalities can all be caused by a lack of hydration during pregnancy. Both the mother and the infant are at risk if they are very dehydrated. Dehydration in pregnant women may be readily avoided by utilising a dehydration detection device. In this project we use sweat sensor to detect the dehydration level, and processed the data using Arduino UNO and the dehydration level of pregnant women can be seen in the display.This project alert the pregnant women to keep their body hydrated.

6. CONCLUSION

The project is useful for pregnant ladies to maintain their hydration level,healthier metabolic activity and also they can have proper balanced fetal growth. And also it ensures about body water balance which is essential changes for fetal growth and fluid supply through amniotic

fluid and thus we adapt to ensure and monitor the body water level through LCD display.Thus we are providing high quality of health care.

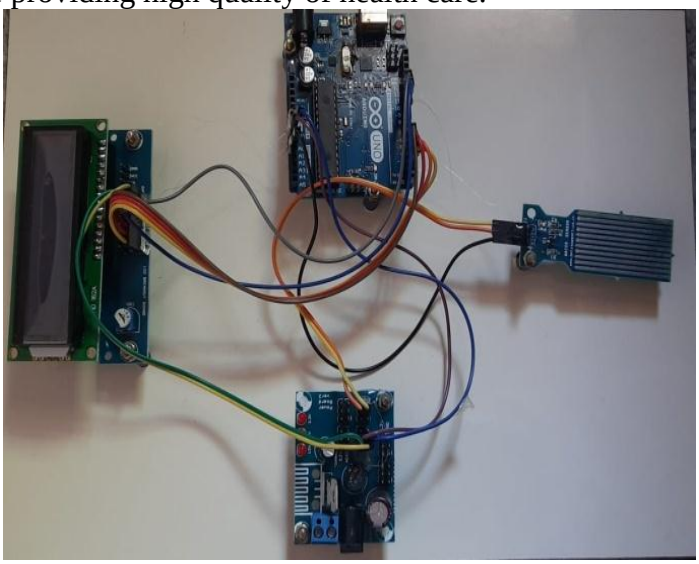

Fig.2 Output kit

Future scope

Thus we can expand this technology by wearable hydration monitoring watch.This will provide information about the body updates for the pregnant ladies.It is very simple,reliable and user friendly.It is portable for the patient and it can be easily accessible by the patient through Bluetooth which is a wireless technology.Thus we can give alert that monitors the water level in the patient.This technology can be developed not only with hydration level monitoring,but also we can track heart rate,metabolic activity and accurate sweat level measurements.

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