UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TEMPERATURE MONITORING SYSTEM FOR BABY USING WEB-BASED

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer Systems) with Honours

by

NUR FAZLIN ATIQAH BINTI RAMLI

B071310285

910627-14-5792

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ABSTRAK

Projek ini bertujuan untuk memantau suhu badan bayi secara berterusan dan meningkatkan keupayaan peranti yang digunakan adalah mudah dan juga berkesan untuk bayi juga ibu bapa itu sendiri. Projek ini juga membantu pengguna untuk mengawal kesihatan bayi dan dapat mengesan gejala awal yang boleh menjadi gangguan kepada bayi apabila mereka sakit Sistem Pemantauan Suhu Bayi Menerusi Laman Sesawang adalah peralatan peranti yang menggunakan sensor suhu yang disambungkan dengan rangkaian internet yang membolehkan data dari sensor untuk disimpan di dalam sistem pangkalan data. Sistem pangkalan data ini digunakan untuk menyimpan semua koleksi data dari sensor untuk membolehkan pengguna untuk memantau suhu bayi pada laman sesawang. Selain itu, terdapat sebuah aplikasi yang digunakan sebagai sistem isyarat mesej pemberitahuan yang membolehkan pengguna untuk mendapatkan notifikasi apabila suhu bayi berubah-ubah dalam beberapa keadaan. Melalui sistem projek ini, mana-mana pengguna boleh memantau suhu daripada pelbagai jenis badan dimana ianya dikesan secara automatik dan berterusan dengan peranti ringkas dan mudah.

ABSTRACT

This project aims to monitor baby‘s body temperature continuously and enhance the ability that the device use is convenience hence effective for the baby also the parents itself. This project will also help the user to control baby‘s health and could figure out early any symptoms that could be bothersome for baby when they are sick. Temperature Monitoring Sytem Used For Baby Using Web-Based is a device equipment that use temperature sensor with the connection of an internet that allow the data from the sensor to be store in database system. The database system is use to store all the data capture from the sensor to enable the user to monitor baby‘s temperature on a website. Moreover, there are an application used as a notification alert message system that enable the user to get notify when the temperature of the baby changing in some condition. Through this project system, any user could monitor the temperature of any kind of body detected automatically and continously with a simple yet convenience device.

DEDICATIONS

This report is dedicate to my beloved parents, family and friends for their endless love, support and encouragement.

ACKNOWLEDGMENTS

First of all I feel blessed and grateful to Allah for giving me a great and blessing life. Greatest wish to myself for completing this report successfully. Secondly, I would like to express my appreciation to my beloved parents and family for their love and support throughout the entire of my life. Thank you for giving me strength to achieve my dreams and always be there when I need. Sincerely thanks to my supervisor Mr. Zulhasnizam Bin Hasan for guiding me and gives full support throughout this project, and thanks for believing my effort and put your trust in me. Big thanks for your time and knowledge that I barely could not repay. I believe I learned from the best.

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CHAPTER 1

INTRODUCTION

The first chapter introduces brief idea of the project. It focused on the overview of the project, detailing the objectives, the problem statement, scope and significant of the project

1.0 Background

In community nowadays, many equipment were invented to check body temperatures. These equipment used as the precaution step to show when ones having a fever. However, the purpose of developing the Temperature Monitoring System using Web-Based is to monitor the baby temperature time to time automatically and the reading of the temperature obtain will be send and store in the database system. When the temperature monitoring system is in use it will detect the temperature of a baby‘s skin surface by using an indicator attach to the baby. This invention allows the caregiver also a parents to get the temperature reading of the baby in any particular time without any present and able to monitor through their system. Furthermore, it is to prevent the inconvenience of the baby when they have a fever and need a regularly checkup.

As stated in Fever and Antipyretic Use in Children, fever is a physiological mechanism that has beneficial effects in fighting infection. Fever in a child is one of the most common clinical symptoms managed by pediatricians and other health care providers and a frequent cause of parental concern. Parents are frequently concerned with the need to maintain a normal temperature in their ill child.(Care 2011)

Moreover, measuring temperature in ill infants and children is a vital assessment parameter. In general, to determine the presence or absence of fever the measurement of

body temperature is used. However, many factors could determine a fever. For example such as age, activity level, and time of day, disease or illness, ambient temperature, and clothing can influence body temperature. (Statement 2006)

1.1 Problem Statement

An invented materials with the technology nowadays to check the temperature are very useful but in some ways it could be a dangerous tools to be used especially for a baby. On top of that, it is very uncomfortable to check a baby‘s temperature when they are sick. In some prospect even when the tools has been invented with technology it was not effective somehow. In the terms of time consuming, most of the time parents or caregiver need to be alert and have to check the baby‘s temperature frequently. Sometimes, they are not alert with the baby‘s condition and it could be dangerous for a baby if the termperature exceed the normal range. So, it is very not encouraging and not very practical.

Previously, the temperature reading taken will then recorded in the file or in some documents. Somehow, the data retrieve for every checkup that has been done on a baby manually might be lose if not being store in database carefully. Through the web based system, the data will automatically store and keep for further references. In addition, we can highlight that when the baby make a move such as in the baby cot, the temperature obtain may be conflict with the environment temperature. The condition of the surrounding also will influence the results. So, with some considerations of the effects that could lead to the functionality of the creation of the product, some research will be conduct.

1.2 Objectives

The objectives of this project are:

1. To monitor the temperature reading automatically through the system.
2. To develop a web-based system database that could store the data.
3. To analyze the baby temperature reading with a convenience contact equipment.

1.3 Scope of project

The scope of the project to ensure that the temperature monitoring system main sensor able to detect the temperature at the skin surface of the baby. Moreover, an alarm will be provide to notify and also will alert the parents or doctor if the temperature exceed to the high temperature value. Meanwhile, the database will be create using a web server where it can store data that connect with the indicator. Besides that, the database system will provide an update to show a prediction of diseases that might be occur because of high body temperature.

The component use for the indicator is Lilypad Temperature Sensor. The LilyPad Temperature Sensor able to detect the temperature of the environment, or whatever is pressed up against the sensor. This kind of sensor offer several advantages over other temperature measurement methods which it can detect physical touch based on body heat and ambient environment conditions. As for that, according to the WEBMD website page, for the normal baby temperature, the range is between 36.1°C to 38.9°C. so, the program code will be set to some particular range that could read the desire temperature range to determine fever in baby.

Other than that, the monitor at the indicator is display using the LED display monitor. Moreover, the database will be create using a MariaDB web server where it provide a system that can collect data and also store it in the system. Throughout the system create, parents or caregiver able to monitor the temperature of the baby and it is

effective to saves time. The whole program for the indicator is using Arduino software and web system.

1.4 Significant of Project

Temperature Monitor System for Baby using Web-Based is expected to provide an efficient solution in the future as a precaution step for baby‘s health. Despite on many devices invented in years back, this project is conducting more on researching the best method that can be use also can be implement anywhere at any place also anytime.

CHAPTER 2

LITERATURE REVIEW

In order to make this project successful, some studies and researching has been done. The information and studies for this project was collected from many sources such as books, articles, journals and internet. All this information was used in this project as a guide to make sure this project can be done in the time given. All the studies and information collected was based on major component and topic that related to this project.

2.0 Body Temperature

To check a body temperature, there are several method can be used. Depending on the age which can be considered at which part of the body are the suitable parts to obtain accurate temperature reading.

Standard body temperature changes for the span of the day and is controlled by one of a kind parts of the brain, hypothalamus. Consequently it will be distinctive relying upon the season of day. In addition, beyond the newborn period, infants and young kids in general to have a higher body temperatures than older children and adults. This is a direct result of their higher metabolic rates and surface zone to body weight proportion. Therefore, it could be considered normal for a baby to have a high temperature during the day of 37.6 C without it being considered a fever.

2.0.1 Range of body temperature that can cause fever

A fever can be defined or known as a high fever or a high temperature. A fever is not an illness by itself and it is usually a symptom of an underlying condition which most often causes an infection. Associated with physical discomfort most people will feel better when it is treated but a fever is depending on age, condition of physical, and the underlying cause your fever. In some cases when you caught with a fever it is possible also impossible of not having a medical treatment for the fever alone. Expertise in medical believes that a fever is a natural bodily defense against infection and there are also many non-infectious causes of fever.

Generally a fever can be considered as non-dangerous disease. Rather than fever, hyperthermia can cause dangerous to body temperature and this can be due to an extreme temperature associated with heat injury, for example heat stroke, side effects of certain medications or illicit drugs, and stroke. Body can no longer able to control body temperature if it is hyperthermia.

2.0.2 Symptoms that can cause fever

As been stated by the Pediatrics from American Academy, it could be a potential of life-threatening infection for an infant younger than 4 months old with a rectal temperature of 38 C or above. (Amita Shroff, 2014)

2.0.2.1 The diseases causes by fever

As stated in World Health Organization, 2014 there are statistic shows the causes of child death under 5 years around the world. Among the diseases infected by the children is causes by a high temperature in their body, that can be determined as high fever. Below is the statistic reffered in a few years back regarding the child uder 5 years death causes by one of the biggest symptoms which is high body temperature. The statistics are:

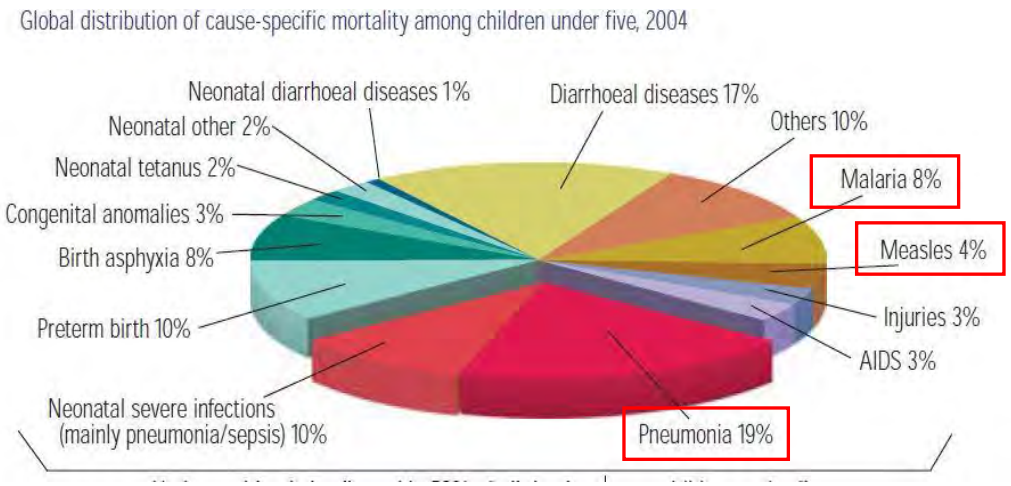

Figure 2.0.2.1.1: Statistic shows in 2004, the diseases infected in children that causes death (Unicef/Who 2006)

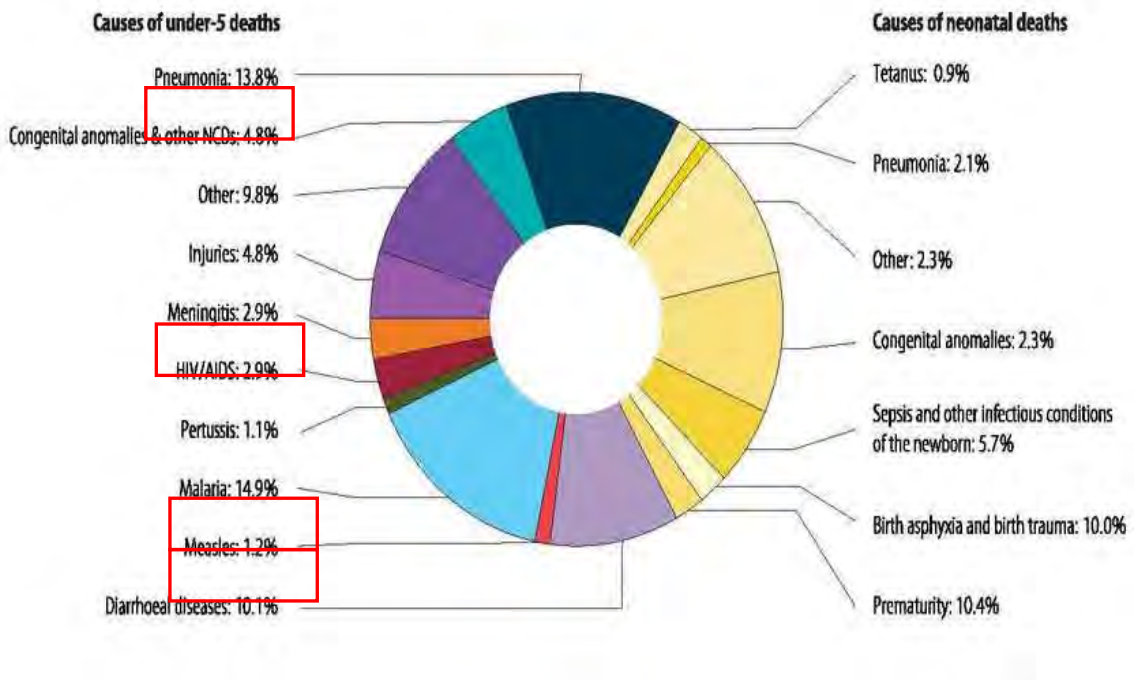

Figure 2.0.2.1.2: Adapted from World health statistics 2014.

The statistic above shows the diseases causes the child death under 5 years for year 2004 and 2011. Some of the diseases highlighted in the Figure 1 and Figure 2 determined the highest percentage of child death which causes by high temperature. The number of death in these two consecutive years increase somehow and it shows some concern worldwide. Some of diseases cause by fever highlighted in the statistic defined as:

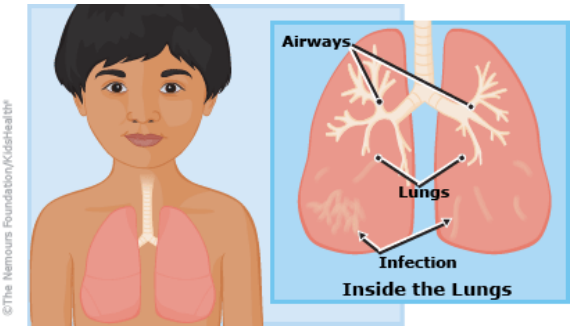

Figure 2.0.2.1.3: Pneumonia is an infection or irritation of the lungs. (Amita Shroff, 2014)

Figure 2.0.2.1.4: Meningitis is an inflammation of the meninges, the membranes that surround the brain within the skull and the spinal cord within the spinal canal. (Christodoulides, 2013)

Figure 2.0.2.1.5: Measles is a highly contagious disease caused by a virus which is tiny organism that can only produce itself by residing within living cell. (Rosaler, 2005)

There is a part that controls body temperature in our brain called as hypothalamus. This part of the brain controls the temperature which usually varies throughout the day and the normal temperature is 37 C. In some other causes, the hypothalamus may reset the body to a higher temperature. Other than a common infection such as colds and gastroenteritis, other causes include:

i. Infections of the ear, lung, skin, throat, bladder, or kidney.

ii. Conditions that cause inflammation.

iii. Side effects of drugs.

iv. Cancer.

v. Vaccines.

vi. Blood clots.

vii. Autoimmune diseases such as lupus, rheumatoid arthritis, and inflammatory bowel disease.

viii. Hormone disorders such as hyperthyroidism.

ix. Illegal drugs such as amphetamines and cocaine.

2.0.2.2 Diagnosis and treatments for fever

A fever seems like very easy to be measured however the causes can be a problem. For a treatment, it may vary depending on the causes of the fever such as, an antibiotics could be used for a bacterial infection like a strep throat. It is include over-the-counter drugs such as acetaminophen (Tylenol) and nonsteroidal anti-inflammatory drugs such ibuprofen (Advil, Motrin) and naproxen (Aleve) which are the most common treatments for fever. (Amita Shroff, 2014)

2.1 Measuring body temperature

Most accurate methods in measuring body temperatures are internal to the body or in body cavity. There are few parts of the body can be measure.(Denton 2015)

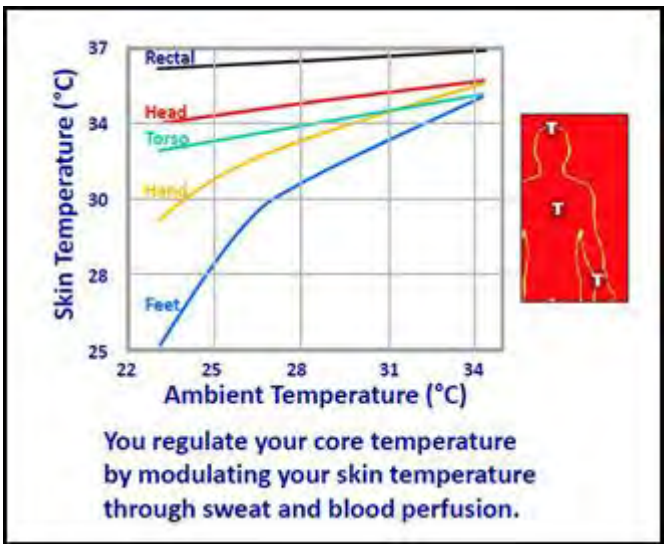

Figure 2.1.1: Parts of body temperature reading could be obtain (Denton 2015)