



RECORDING OF BODY TEMPERATURE USING DIFFERENT DIAGNOSTIC TOOLS – A COMPARATIVE STUDY

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Article Information

Received 12/02/2014; Revised 16/02/2014;
Accepted 29/03/2014

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ABSTRACT

Accurate monitoring of body temperature is an important nursing procedure. Temperature is one of the most familiar, important clinical signs which is a measure of the body's ability to produce and relieve of heat. Temperature ought to be measured precisely to identify fluctuations rapid and occur early. Newer methods like digital, liquid crystal forehead thermometer, and IR tympanic thermometer have evolved with the hope of substituting the mercury thermometers. There are worries about the ecological hazards of mercury. There have been growing concerns about the possible for mercury poisoning. The present study was conducted to find out the accuracy of the digital thermometer in recording body temperature by comparing with gold standard clinical mercury thermometer. The study was conducted among the nursing students. A total of 150 healthy nursing students were selected randomly and written & verbal consent was taken and simultaneous recording were made with both the clinical mercury thermometer and the digital thermometers. It was concluded that the difference between the temperature readings of the two thermometers was not clinically significant. Both the instruments can be used concurrently. It is suggested that digital thermometers should be used in place of the clinical mercury thermometers as it is eco-friendly.

Key words: Clinical, IR, Nursing, etc.

INTRODUCTION

Accurate monitoring of body temperature is an important nursing procedure. The body temperature is the difference between the heat produced by the body processes and the amount of heat lost to the environment. To keep body temperature within a fine safe range although large variations in ecological temperatures is the normal physiology of human body [1,2].

Carl Wunderlich In 1868 set down the point that the normal temperature was indication of health while change of temperature indicates disease [2]. Human body temperature is sustained within 97° and 99°F. For body temperatures recording several types of thermometers are available which includes oral mercury thermometers,

Digital thermometers are used to take oral

digital thermometer, forehead strip thermometer and IR tympanic thermometer [2-3].

A typical method of measuring body temperature is to utilize a clinical mercury thermometer which has Fahrenheit and Centigrade scale. Fahrenheit scale ranges from 94° to 108° F with an arrow at 98.6° F to specify the mean value of body temperature. Centigrade scale ranges between 35° and 42° C with an arrow at 37°C which point out normal body temperature [2-4].

For recording body temperature the clinical mercury thermometer is placed under the tongue or in the armpit or in the groin. The reading obtained in the armpit is on 0.5°F lower than that of obtained in the mouth.

temperature. It is a small hand held device with



a "window" showing the temperature in number. Digital thermometers are easy to handle and measure body temperature within few seconds [3,5]. Low battery is a problem for digital thermometer. The 'gold standard' for recording patient's temperature has been the mercury in glass thermometers [6]. Novel methods have developed with the hope of replacing the gold standard oral mercury thermometers. Extensive literature review has opened a lot of information on why we supposed to stop using the mercury thermometers. Breakages are a regular problem and there are concerns about the eco-hazards of mercury and the potential for mercury poisoning [7]. Mercury-in-glass thermometers have been troubled in period of cross-infection and epidemics of diarrhoea caused by salmonella and *Clostridium difficile* [8]. Fadzilet al., [9] in 2008 conducted a study on the precision of the various non-invasive thermometers like digital, forehead strip, tympanic thermometer and mercury thermometers. He found that the digital thermometer gave the best concordance. An increasing fashion is seen in health care team and general population to use digital thermometer; however, the precision of the device is uncertain. A number of investigators in different countries observed that the mercury thermometer is more accurate than other thermometers [10]. So far there is no available data in this country. Therefore, the present study was designed to compare the recordings of body temperature using clinical mercury thermometer and digital thermometer.

Objective

To compare the body temperature by using the clinical mercury thermometer and digital thermometer.

METHODOLOGY

This cross-sectional study was conducted in the Community Nursing Department, Sri Venkateswara College of Nursing from December 2013 to Jan 2014. All first year Nursing students at the age of eighteen (18) to twenty one (21) years were selected at random by selecting every third student. The students were explained the principle of the study. Both the written & verbal consent was taken from the students without any compulsion. When students did not agree for any reason next student was selected. The inclusion criteria were healthy student without the history of fever or any acute and chronic illnesses. The exclusion criteria were students aged below 18 years and exceeding 21 years, suffering from fever, history of any type of infection, history of any cardiac diseases or peripheral vascular diseases, history of hyperthyroidism, hypothyroidism. Oral-temperature was recorded with mercury thermometer and the digital thermometer. It was ensured that the subject had not taken cold or hot drink during the last 30 minutes and they were in ambient room temperature for the last one hour.

RESULTS

A total number of one hundred & fifty (150) first year nursing students eighteen (18) to twenty one (21) years age were selected randomly by selecting every third student. Mean values of temperature from both the methods were calculated and compared with each other to determine the level of significance by applying student 't' test. Results are summarized in (Table 1).

Table 1. Distribution of Study population according to Age

Mean Age +/- SD Years	Range (Years)
18.5 +/- 2.78	18-21

Table 2. Comparison of body temperature recorded with Mercury thermometer & liquid-crystal thermometer

Type of Thermometer	Temperature (Mean +/- SD)	P Value
Mercury Thermometer	98.42 +/- 1.24	<0.51*
Digital Thermometer	98.84 +/- 1.24	

P Value is not significant (>0.05)

DISCUSSION

Temperature recording is an indispensable step in the assessment of both in and out patients all over the world. Patients presenting with high grade fever needs an imperative diagnostic evaluation, leading to timely therapeutic intervention. Hence grading of temperature comprises clinical implication. Mercury thermometers are widely used for such purposes. Introduction of digital thermometer has made temperature recording easy and

safe but their precision has been questioned⁴. The results of the present study show that the digital thermometer is a good alternative to the traditional clinical mercury thermometer. It was concluded from the results of the present study that the difference in the temperature readings between the clinical mercury thermometer and the digital thermometer is of no clinical significance. The digital thermometer should be used as it is environmentally friendly.



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