HAND DYNAMOMETER FOR MINOR STROKE

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ENDORSEMENT

"I hereby acknowledge that I have read this report and I find that its contents meet the requirements in terms of scope and quality for the award of the degree of Bachelor of Electronic Engineering Technology (Medical Electronics)

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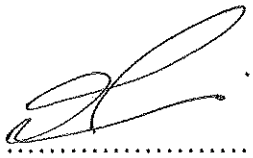
DECLARATION

"I hereby declare that the work in the report is my own except for quotation and summaries in which have been duly acknowledge"



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ABSTRACT

A hand dynamometer measures the grip strength and improvement of an individual or patient. This device are used to measure the strength and endurance of the arm muscle and strength of each hand. Hand dynamometer can be used for patient with neurological problems and stroke. The purpose of this project is to develop a hand dynamometer with flexiforce pressure sensor. The existing hand dynamometer is heavy and not portable to be carried around. Furthermore the existing device measures the reading of all the fingers with analog system .The current hand dynamometer available in the market are expensive and do not allow measurement of force due to grip, limiting the ability to measure small changes in very weak patients. This study focuses on developing a hand dynamometer with flexiforce pressure sensor, analyses the accuracy of the measurement and validate the device. This device is a combination of analog hand dynamometer and hand exerciser digiflex, the programming is done to obtain the measured reading from the hardware. The accuracy of the measure unit has been tested and the comparison between the analog and digital has been done. The analysis showed that the accuracy of digital system is better than the existing analogue hand dynamometer.

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CHAPTER 1

INTRODUCTION

1.1 Overview

Stroke is the third largest cause in Malaysia[1]. Stroke does not kill. It results in disabilities that affects a person's ability to continue working or living a normal life.

Strokes are due to sudden interruption of the blood supply to the brain. This can occur in two ways; when a blood vessel is blocked due to a clot (known as ischaemic stroke) or when a blood vessel in the brain ruptures leading to bleeding in the brain (known as haemorrhagic stroke). About 80% of strokes are of the ischaemic type and 20% haemorrhagic[1].

Stroke may effect hemiparesis (weakness on one side body),when the stroke patients is in hemiparesis, they are not able to move their arm freely. When stroke occurs, one of the parameter that is used to measure the patients hand strength is hand dynamometer. A hand dynamometer measures the grip strength and improvement of an individual or patient. This device are used to measure the strength and endurance of the arm muscle and strength of each hand. Hand dynamometer can be used for patient with neurological problems and stroke.

1.2 Problems statement

The existing hand dynamometer is heavy and not portable to be carried around. The existing device measures the reading all the fingers with analogue system. Do not allow measurement of force due to grip. Lack of measurement indicator for testing the finger muscle strength of the patient.

1.3 Objective

The main objective of this study are:-

1. To develop hand dynamometer with flexiforce pressure sensor.
2. To analyze the measured parameter in dynamometer.
3. To validate the performance of hand dynamometer.

1.4 Scope of the study

This study focuses on developing a hand dynamometer with flexiforce pressure sensor, analyses the accuracy of the measurement and to validate the device. The scope divided as below:

1. This project only focuses on hand of people who suffer minor sroke problem.
2. This project focuses on the reliability and usability of this device on subject's hand
3. This project focus on rehabilitation process phases for Patient that suffered strokes to measure the strength of their grip.

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