CHAPTER 3

METHOD:

Introduction

This chapter considers the study design used and stipulates inclusion and exclusion criteria for selection of subjects. The pilot study conducted is briefly discussed. The data collection method as well as the tools used in the collection is elaborated upon.

3.1 Study design

This is a descriptive study consisting of the comparison of the execution of specific ADL tasks of patients who have had a stroke and a control group of patients who are hypertensive and hence at risk of having a cerebral vascular accident (CVA). Jacob (2005) indicates that hypertension is one of the highest risk factors for stroke. Forty to ninety percent of stroke patients have high blood pressure prior to the stroke. People with hypertension have a four to six times greater risk for stroke than those without hypertension (Jacob, 2005). Furthermore; hypertension is often co-morbid with other risk factors for stroke such as poor diet and obesity. By choosing a control group already at risk for stroke ensured that the groups were comparable and possible shared similar health profiles. Choosing a control group who were healthy would not indicate the energy compromise that patients with hypertension have due to risk factors present. Hence patients with hypertension were selected as the control group.

3.2 Study Sample

A sample of convenience for the experimental and control groups was recruited from the Department of Occupational Therapy at Chris Hani Baragwanath Hospital, the Diepsloot Community Training Site at the Bona Lesedi Project and the hypertension out-patient department at Helen Joseph Hospital.

3.2.1 Stroke Group

Inclusion Criteria:

Adult males and females who fulfilled the following criteria:

- Age range of 30 – 80 years
- A CVA in the last eighteen months

Any degree of voluntary movement in the arm, hand and lower limb

Exclusion Criteria:

- Subjects with any pulmonary, cardiac, orthopaedic and metabolic diseases whose participation in ADL activities are affected due to problems with the above systems
- Subjects presenting with severe aphasia, perceptual deficits or cognitive deficits that prevented the comprehension and execution of the ADL tasks.

3.2.2 Hypertensive Group

Inclusion Criteria:

Adult males and females who fulfilled the following criteria:

-Age range of 30 – 80 years

-Diagnosed with hypertension and were following a medical regime related to the treatment of hypertension

Exclusion Criteria:

Current or premorbid medical history indicating neurological, musculoskeletal, cognitive or perceptual dysfunction that can lead to poor execution of the dressing tasks as a result of these impairments.

3.3 Measurement

Data Collection Methods:

3.3.1 Ethics

Ethical Clearance to proceed with the study was obtained from the Committee for Research on Human Subjects, University of the Witwatersrand. The protocol number is M050116 (Appendix 8).

Specific ethical considerations included:

- Each subject was allocated a number as no names were used to ensure confidentiality
- Subjects were allowed their privacy and dignity while engaging in ADL tasks by ensuring that the environment was screened off and private.
- Informed consent was signed by each subject (Appendix 1 and 3) prior to data collection.
- Subjects could withdraw from the study at any stage and feedback would be provided if requested.

3.4 Measuring Instruments:

Demographic Information Form: Experimental Group (Appendix 2**)**
a) This was used to record information of a structured interview where demographic information, medical history and course of illness were documented.
b) Subjects were evaluated to establish the active movement present in the arm, hand and lower limb. This was used to rank them according to the Brunnstrom Stages
c) A Likert Scale using 5 ranges was used to evaluate the subject's perception of difficult of the task on a five point scale
d) A bathroom scale was used to weigh the subjects and their height was measured

Demographic Information Form: Control Group (Appendix 4)
a) This was used to record information of a structured interview where demographic information, medical history and period of illness were documented.
b) A Likert Scale using 5 ranges was used to evaluate the subject's perception of difficult of the task on a five point scale
c) A bathroom scale was used to weigh the subjects and their height was measured

Summary data sheet of RT3: (Appendix 5)

Having completed the ADL task, the RT3 device was removed from the left hip and docked in the Body Composition Index Apparatus connected to the laptop. The data was then automatically downloaded and provided a spreadsheet of information indicating the following:

- The age of the subject
- The height of the subject
- The weight of the subject
- The total caloric expenditure of the task in kilo calories
- The total time in minutes to execute the task
- The X value indicating the activity counts that a subject moved in an anterior-posterior plane
- The Y value indicating the activity counts that a subject moved in a vertical plane
- The Z value indicating the activity counts that a subject moved in a medio-lateral plane

The RT3 device was calibrated such that the total caloric expenditure can be calculated by multiplying the total caloric expenditure by 70 and dividing by the weight of the individual (Hill, 2005).

Activities Health: Activity Profile (Appendix 6)

All subjects in the experimental group were asked to narrate their engagement in activities of daily living

Activities Health: Satisfaction (Appendix 7)

This aspect of activities health was executed on completion of the activity profile with the subject. For the purposes of this study, only the satisfaction aspect was considered. Other categories of balance, sense of comfort, social appropriateness and variety were not necessary to evaluate in the context of the overall aims of this study. Subjects are asked if they felt satisfied on how they spent their day and to elaborate briefly to justify their response.

Screening Factors (Appendix 9)

Subjects were deemed suitable for study if they met the inclusion criteria. This was established using a screening form.

3.3.2 Pilot Study

A pilot study was executed once ethical clearance was obtained. The aim was to familiarize the researcher with the use of the accelerometer and subsequent downloading and reading of the data. Four subjects were tested.

The pilot study also investigated the availability of subjects and the suitability of the research venues. The following adjustments were made to the research on completion of the pilot study:

- The sample population age was adjusted from subjects falling within the ages of 30-60 years to subjects falling within the ages of 30-80 years. It was originally decided to exclude subjects between 61-80 years as the natural aging process could result in increased energy expenditure due to related weakness and postural changes. The pilot study however indicated that by excluding this age group a large portion of the population would be excluded as many patients suffering from stroke fell within this age group. It was then decided to include this age group but the researcher had to ensure that there were no significant postural changes or other age related pathology in the subjects between 61-80 years that would bias the research findings. Appendix 8 indicates the screening factors that were considered.
- The researcher also decided to download information from the accelerometer twice with each subject, once after the dressing upper limb and trunk and then after dressing lower limb and feet so as to separate the data on each aspect of dressing.

3.3.3 Data Collection: Experimental Group

Therapists at the Chris Hani Baragwanath Occupational Therapy Department, the Diepsloot Training Site and Helen Joseph Out Patient Department were informed of the inclusion and exclusion criteria and asked to assist in obtaining subjects. Appropriate dates suiting the therapists and the institutions, the researcher and subject availability were agreed upon. The researcher then made arrangements for times and testing venues in order to collect data.

On arrival on the specified dates and times, the researcher reviewed the availability of subjects. The environment for testing was prepared such that it consisted of:

- a 3m by 4m room
- a chair with a backrest and suitable support.
- an ADL dressing pack that included a blouse / shirt with buttons on the anterior aspect and long sleeves with cuff buttons, long pants with anterior zip, a knee length skirt with side zip and socks. If subject or control had the same style of clothing, these were utilized instead of the items in the ADL Pack. Different sizes of clothes were accommodated for.

It was found that this environment could not be achieved at the Diepsloot Training Site as patients were unable to access the site due to transport limitations. The researcher resorted to visiting homes but found that the environments in the homes were not always conducive to doing the study. As a result only one subject from the Diepsloot Training Site was included in the study.

Having established an optimal environment, subjects who met the inclusion criteria were asked to participate in the study and were required to sign informed consent after being informed of the purpose and requirements of the study (Appendix 1).

The researcher proceeded to interview the subjects in order to complete the demographics form (Appendix 2). This was used to record information of a structured interview where demographic information, medical history and course of illness were documented.

The subjects were then weighed using a standard bathroom scale and their height was measured. Calculations were done to establish their body mass index (BMI).

The RT3 device was then docked in the Body Composition Indicator which was linked to a computer. This device is self calibrating when a user profile is created

by entering the subject's user identification (code for subject), their age, weight and height. A user profile was then created and ready for reading data.

Subjects were asked to remove their garments on their upper bodies. Undergarments were retained. The subjects were then fitted with the triaxial accelerometer. This was fitted by the researcher on a Velcro belt and worn on the subjects' left hip at midpoint of the iliac crest.

Subjects were required to perform the following ADL activities:

- Dress the upper limbs and trunk with shirt / blouse with long sleeves and buttons on anterior aspect of trunk
- Fasten buttons on the anterior aspect of shirt / blouse
- Fasten buttons at the cuff of sleeve

On completion of the task, the stop button was activated and the accelerometer was removed and the data downloaded. The accelerometer was re-calibrated and placed on the left hip. Subjects were then required to dress their lower limbs with long pants for men with anterior zip and knee length skirt for women with side zip. Men and women were required to don socks and slip-on shoes. Thereafter the accelerometer was deactivated, removed and the data downloaded.

Subjects were then asked to rate their perception of the difficulty of the tasks according to the Likert Scale (Appendix 2). All subjects were asked to complete an activities profile by narrating their sequential engagement in ADL tasks through the duration of a day. Data were recorded by the researcher on an activity profile (Appendix 6). The subjects were also asked to relate their perceived satisfaction of the number and variety of tasks they engaged in and their sense of satisfaction of how they spent their days on the Activities Satisfaction Form (Appendix 7). Only the satisfaction aspect of the assessment was conducted.

3.3.4 Data Collection: Hypertensive Group

Subjects were recruited at the Chris Hani Baragwanath Medical Out Patient Department as well as The Helen Joseph Out Patient Department.

On the specified dates and times, the researcher reviewed the availability of patients. The researcher followed the same procedure to collect data as was used for the subjects in the stroke group.

On arrival on the specified dates and times, the researcher reviewed the availability of patients. The environment for testing was prepared such that it consisted of:

- a 3m by 4m room
- a chair with a backrest and suitable support.
- An ADL dressing pack that included a blouse / shirt with buttons on the anterior aspect and long sleeves with cuff buttons, long pants with anterior zip, a knee length skirt with side zip and socks. If subject or control had the same style of clothing, these were utilized instead of the items in the ADL Pack. Different sizes of clothes were accommodated for.

Having established an optimal environment, individuals who met the inclusion criteria were asked to participate in the study and were required to sign informed consent after being informed of the purpose and requirements of study (Appendix 3). The researcher proceeded to interview the subjects in order to complete the Demographics Form (Appendix 4). This was used to record information of a structured interview where demographic information, medical history and period of illness were documented. A Likert Scale was used to evaluate the subject's perception of difficulty of the task on a five point scale.
The same procedure for data collection methods was used as in the experimental group. The control group however, where not asked to complete an activity profile or rate their activity satisfaction as this was not an objective of the study

3.5 Data Processing Methods and Data Analysis

3.5.1 Organization of Data

Numerical coding was used to identify subjects in their respective groups. Data was then organized according to:

- Continuous variables: age, weight, motion axes, BMI, energy expenditure time taken in and hours
- Ordinal Data : Likert Scale (ranked 1-5) and Brunnstrom Scale (stages 2-6)
- Nominal Data gender and status (experimental or control group)

Utilizing pie charts, the activity profiles of all subjects were presented to identify trends in time expenditure.

3.5.2 Statistical Methods

Descriptive statistics were used to describe, summarize and organize certain continuous and nominal data. Means and standard deviations were determined. From the activity profiles, the averages of time spent in personal management, sleep, work, leisure and unconstructive time were compiled and translated into pie charts for weekdays and weekends. Factors emanating from statements regarding activity satisfaction were compiled and tabulated according to frequencies of the statements.

The following statistical procedures were used to analyze the data:

Non parametric statistics, the Wilcoxon (Kruskal-Wallis Test) were used for variables such as weight and time that was not normally distributed (Petrie, 1987).

Parametric data were analyzed using t-tests. This included establishing if a significant difference between the two groups existed for age, height, gender total caloric expenditure, METs and activity counts in the three motion paths.

Linear regression was used and the resulting correlation was used to determine a relationship between certain variables such as energy expenditure, time and weight. An ANOVA (Welch's Variance-weighted ANOVA) was used to establish variances between the groups. Simple correlations were used to determine the relationship between active movement, perceptions and energy expenditure.