DRUG COMPLIANCE AND STROKE PREVENTION AMONG HYPERTENSIVE PATIENTS AT HOSPITAL UNIVERSITI SAINS MALAYSIA (HOSPITAL USM), KUBANG KERIAN, KELANTAN

by

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TABLE OF CONTENTS

CONTENTS (continued)

CONTENTS (Continued)

CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

Pages

LIST OF ABBREVIATION

AHT Antihypertensive Drug Therapy

HBM Health Belief Model

KPP Klinik Pakar Perubatan

MOH Ministry of Health

NHMS National Health Morbidity Surveys

SPSS Statistical Package for Social Science

USM Universiti Sains Malaysia

DRUG COMPLIANCE AND STROKE PREVENTION AMONG HYPERTENSIVE PATIENTS AT HOSPITAL UNIVERSITI SAINS MALAYSIA (HOSPITAL USM), KUBANG KERIAN, KELANTAN

ABSTRACT

Drug compliance is important for hypertensive patient because non-compliance of the drug regime can contribute to complication such as stroke. The purpose of this descriptive study was to determine the level of drug compliance and score in stroke prevention knowledge among hypertensive patients at Hospital Universiti Sains Malaysia (Hospital USM), Kubang Kerian, Kelantan. Hypertensive patients at Klinik Pakar Perubatan (KPP) at Hospital USM were recruited. The patients were selected by using random sampling technique. Data were obtained by using self-administered questionnaire, a modified Medication Adherence Scale to asssess level of drug compliance among hypertensive patients and other questionaire to assess score of stroke prevention knowledge among hypertensive patients. Three experts tested the content validity of instruments, and the reliability obtained by Cronbach's alpha coefficients were 0.782 respectively. The data were analysed with SPSS versión 20.0, by using descriptive statistics, simple logistic regression and simple linear regression test to answering the research questions. The result showed the majority of the hypertensive patients (57.9%) were non-adherent to their drug regime whereas on stroke prevention knowledge, majority of them (62.6%) had moderate knowledge, followed by low knowledge (20.6%) and only (16.8%) recorded high knowledge. There was a significant association between socio-demographic data with knowledge in stroke prevention, age ($\rho = 0.001$) and level of education ($\rho = 0.001$). There was also a significant association between levels of drug compliance and knowledge in stroke prevention ($\rho = 0.04$). However, there was no significant association between socio-demographic data with levels of drug compliance, age ($\rho = 0.28$), gender ($\rho = 0.16$) and level of education ($\rho = 0.53$). In conclusión, the findings of this study will provide a guideline for healthcare provider such as nurses and doctor to improve in giving health education on the importance of compliance in drug regime among hypertensive patient and to increase their knowledge in stroke prevention.

KOMPLIAN UBAT-UBATAN DAN PENCEGAHAN ANGIN AHMAR DALAM KALANGAN PESAKIT DARAH TINGGI DI HOSPITAL UNIVERSITI SAINS MALAYSIA (HOSPITAL USM), KUBANG KERIAN, KELANTAN

ABSTRAK

Komplian ubat-ubatan bagi pesakit darah tinggi adalah penting kerana sekiranya tidak komplian, ia akan mnyumbang kepada komplikasi seperti angin ahmar. Kajian berbentuk keratan lintas dan bercirikan deskriptif ini bertujuan untuk menentukan tahap komplian ubat-ubatan dan skor pengetahuan dalam pencegahan angin ahmar dalam kalangan pesakit darah tinggi di Hospital Universiti Sains Malaysia (Hospital USM), Kubang Kerian, Kelantan. Pesakit darah tinggi di Klinik Pakar Perubatan (KPP) di Hospital USM telah dipilih. Pesakit-pesakit telah dipilih berdasarkan prosedur persampelan rawak. Instrumen yang digunakan dalam kajian ini adalah skala pematuhan ubat yang diubah suai untuk menilai tahap komplian ubat-ubatan dalam kalangan pesakit darah tinggi dan juga soal selidik untuk menilai skor pengetahuan pencegahan angin ahmar dalam kalangan pesakit darah tinggi. Tiga orang pakar berpengalaman telah menguji tahap kesahan dalam kajian, dan kebolehpercayaan dalam penyelidikan pula diperolehi melalui kajian pilot dengan Cronbach alpha 0.782. Data seterusnya diproses menggunakan SPSS versi 20.0. Analisis data dijalankan menggunakan statistik deskriptif, ujian, regresi logistik mudah dan ujian regresi linear mudah untuk menjawab soalan kajian. Berdasarkan keputusan kajian ini, majoriti daripada pesakit darah tinggi (57.9%) adalah tidak komplian kepada rejim ubat manakala bagi pengetahuan tentang pencegahan angin ahmar, majoriti daripada mereka (62.6%) mempunyai pengetahuan yang sederhana, diikuti oleh pengetahuan yang rendah (20.6%) dan hanya (16.8%) direkodkan mempunyai pengetahuan yang tinggi. Keputusan kajian menunjukkan terdapat hubungan antara data sosio-demografi dan pengetahuan tentang pencegahan angin ahmar, umur ($\rho = 0.001$) dan tahap pendidikan ($\rho = 0.001$). Keputusan kajian juga menunjukkan terdapat hubungan antara tahap pematuhan ubat dan pengetahuan dalam pencegahan angin ahmar ($\rho = 0.04$). Walaubagaimanapun, tiada hubungan antara data sosio-demografi dan tahap pematuhan ubat, umur ($\rho = 0.28$), jantina ($\rho = 0.16$) and tahap pendidikan ($\rho = 0.53$). Secara keseluruhannya, diharapkan hasil kajian

ini dapat dijadikan panduan kepada jururawat dan doktor untuk memperbaiki pendidikan kesihatan tentang kepentingan pematuhan ubat dalam kalangan pesakit darah tinggi dan mempertingkatkan lagi pengetahuan mereka dalam pencegahan angin ahmar.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Hypertension is a significant public health problem in many countries. It has massive disturbing impact on the population's health, resulting in unnecessary morbidity and mortality. The assessment, management and control of hypertension will remains an important public health challenge and one of the most important risk factors for coronary heart disease, stroke, heart failure, and end-stage renal disease (Morisky, Ang, Krousel-Wood, & Ward, 2008). The disease account for more than 5.8 % of death worldwide, loss of 11.9 % year of life and adjusted life of 1.4 % (Saleem, Hassali, Shafie, Awad, & Bashir, 2011).

One billion individuals worldwide was affected by hypertension (Azuana, Nur Sufiza, & Paraidathathu, 2012). In Malaysia, the prevalence of hypertension among adults aged 30 years and above has increased from 32.9 % in 1996 to 40.5 % in 2004 (Rampal, Rampal, Azhar, & Rahman, 2008). According to Hassan et al. in 2006, the Second National Health Morbidity Survey in Malaysia has reported that the prevalence of hypertension among adults aged 30 years and above was 29.9 % of whom 32.6 % had stopped treatment since diagnosis.

The main reasons given for noncompliance's are predominantly based around poor communication include the perception that hypertension was not a serious illness, the patient had been cured or that treatment was no longer required (Hassan et al., 2006).

Hypertension was defined as a systolic blood pressure of more than 140 mmHg and/or diastolic blood pressure was more than 90 mmHg (Muntner, Anderson & Charleston, 2010). The medical treatment for hypertension recently is by using the drug therapy. The use of antihypertensive drug therapy (AHT) has been shown to reduce the risk of stroke and coronary heart disease. In relation to prevent any complication of hypertension, patients should compliance to the drug therapy.

According to Al-Ramahi in 2014, patient compliance to treatment is the degree to which patients adhere to medical advice and take medicine as directed. Lack of compliance with blood pressure-lowering medication is a major reason for poor control of hypertension. The chronic nature and absence of the symptom may cause the patients to skip the drug regime or failed to take the medication (Bramley, Gerbino, Nightengale & Frech-Tamas, 2006).

One of the complications of hypertension is a stroke. Stroke ranks at top five of causes of mortality in Malaysia with the rate of 8.3/100,000 population (Siti Noorkhairina, Sakinah, & Che Rabiaah, 2013). There are two types of strokes, namely ischemic stroke and hemorrhagic stroke. Hypertension is usually associated with hemorrhagic stroke. It occur when there is a weakened blood vessel that burst due to uncontrolled blood pressure (American Stroke Association, 2013). Stroke can cause death and is a leading cause for long-term disability. The disability include making it difficult for many patients to get out of bed, walk short distances or perform the basic activities of daily living as well as impairing speech and physical functioning. The disability impact from stroke can cause burden and pressure for caregiver thus can cause problem in health society.

Stroke is a preventable disease. The majority of the established risk factors of stroke are preventable or modifiable either through lifestyle modification or medication (Anuar Deen, Nik Azlan, Mohd Fairuz, & Zuraidah, 2014). According to Anuar Deen et al., (2014) also, poor knowledge of stroke risk factors and warning signs in the general population has been shown in previous studies.

1.2 Problem Statements

Hypertension is an overwhelming global challenge which ranks at third ranks as a cause of disability-adjusted life-years (Kearney et al., 2005). The burden of hypertension is currently centered in economically developed countries (37.3 %), however developing countries will feel greater impact due to their larger population proportion (Hashmi et al., 2007). The national prevalence of hypertension in Malaysia based on the National Health and Morbidity Survey III (NHMS) in 2006 was 32.2% for residents aged18 years and above (Tee et al., 2010). The prevalence of hypertension is high but the levels of drug compliances is low which has been reported in Malaysia, 44.2% (Al-Ramahi, 2014).

Stroke is a growing public health problem that has remained a leading cause of death and the major cause of disability in the United States and throughout the world (Akinyemi et al., 2009). In Malaysia, stroke ranks top five causes of mortality in Malaysia (Table 1) with the rate of 8.3/100,000 population or 4052 deaths in year 2009 which ranks the top fifth common causes of death after pneumonia (Ministry of Health, 2009).

Table 1.1: Top mortality rate in Ministry of Health (MOH) Centre

Mortality (rate per 100 000 population) in percentage	
Heart disease and disease of pulmonary circulation	16.09 %
Septicemia	13.82 %
Malignant neoplasm	10.85 %
Pneumonia	10.38 %
Cerebrovascular disease (stroke)	8.43 %

(Source: MOH, 2009)

Most of the hypertensive patient has lack of knowledge regarding the disease and the complication which is a stroke. In addition, patient also has a lack of knowledge in understanding the cause of the disease, the medical treatment, the drug regime that they should comply, the purpose of the hypertension drug that they eat, the side effect of the medication and the complication from noncompliance from hypertension treatment or drug. Early study have suggested that physician-patient relationship are associated with compliance of drug (Kerse et al., 2004). Lack of time to consult and give health education

to patient by physician and other healthcare provider may be the cause of the lack of knowledge among patient.

Apart from that, the problem is because of patient negative attitude towards hypertension medication which is can be accessible from any government clinic and hospital. Even though Ministry of Health had provided extra consideration about their health, the factor of the negative attitude may need to be studied to identify the solution. Most of hypertension patient does not compliances to the drug regime and take the medication only when the symptom persist.

On the other hand, patient does not received health education related to hypertension and benefit of hypertensive drug therapy. The health education programme may not achieve their objective in order to give health education to the patient. Patient socio-demographic data such as patient that come to rural area may more likely to lack of knowledge regarding hypertension and benefit of the drug to them due to lack of accessible facilities.

Despite from that, limited patient support by the medical staff, family members and community regarding the importance of taking hypertensive therapy regularly are factors identified contributed to incidence of stroke. Family support may be the biggest factor for patient to comply with the treatment and continue the medication.

The awareness of the need to identify the drug compliances and knowledge in stroke among hypertension patient has affected the development of the instrument. Factors contributing to drug compliance may vary from country to country and may contribute to the variation of results in the publish studies (Hassan et al., 2006). Furthermore, the compliance is a dynamic phenomenon and its degree may be vary over time.

Therefore, the aim of this study is to determine whether hypertensive patient are compliance to their pharmacological treatment and to assess their knowledge in stroke prevention thus can ascertain achievement in stroke prevention proggramme. Health Belief Model (HBM) will be used in this study to explain the issue and phenomena.

1.3 Objectives of the Study

1.3.1 General Objectives

To determine the drug compliance and knowledge in stoke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.

1.3.2 Specific Objectives

The specific objectives for the study are:

1. To determine the level of drug compliance among hypertensive patient at Hospital Universiti Sains Malaysia.
2. To determine the level of knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.
3. To determine the association between selected socio-demographic data (age, gender, education levels) with level of drug compliance among hypertensive patient at Hospital Universiti Sains Malaysia.
4. To identify the association between selected socio-demographic data (age, gender, education levels) with level of knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.
5. To identify the association between levels of drug compliance and knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.

1.4 Research Question

1. What is the level of drug compliance among hypertensive patient at Hospital Universiti Sains Malaysia?
2. What is the score of knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia?
3. Is there any association between patient's selected socio-demographic data (age, gender, education levels) with levels of drug compliance among hypertensive patient at Hospital Universiti Sains Malaysia?

4. Is there any association between patient's selected socio-demographic data (age, gender, education levels) with knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia?
5. Is there any association between levels of drug compliance and knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia?

1.5 Research Hypothesis

1. Ho: There is no significant association between patient's selected socio-demographic data (age, gender, education levels) with levels of drug compliance among hypertensive patient at Hospital Universiti Sains Malaysia.

   H_A: There is a significant association between patient's selected socio-demographic data (age, gender, education levels) with levels of drug compliance among hypertensive patient at Hospital Universiti Sains Malaysia.

2. H_O: There is no significant association between patient's selected socio-demographic data (age, gender, education levels) with knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.

   H_A: There is a significant association between patient's selected socio-demographic data (age, gender, education levels) with knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.

3. H_0: There is no significant association between levels of drug compliance and knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.

   H_A: There is significant association between levels of drug compliance and knowledge in stroke prevention among hypertensive patient at Hospital Universiti Sains Malaysia.

1.6 Definition of Terms (Operational)

1.6.1 Drug Compliance

In this definition, the adherence or compliances describes behaviors influencing patients outcomes, medication-taking behavior. Nonetheless, when medication-taking behavior is viewed separately, the terms adherence and compliances are used to describe 'the extent to which a patient act in accordance with the prescribed interval, and dose of dosing regimen' (Gosmanova & Kovesdy, 2014). A total of seven questions relevant to the local setting were selected and a full score of 28 or 27 were define as adherent while score 26 and below was categorized as non-adherent (Azuana et al., 2012).

1.6.2 Score of Knowledge in Stroke Prevention

Knowledge is usually assesses to evaluate how patients knowledge correspond to stroke prevention which are related to ability to detect organ affected, ability to choose sign and symptom persist and risk factor associated with stroke. Most of the questions have been using in the previous study (Falavigna et al., 2009).

1.6.3 Stroke

Cerebrovascular accident (CVA) is known as stroke which is consist of two types of stroke. Among ischemic stroke and hemorrhagic stroke, hemorrhagic stroke is common in hypertension patient where it happen due to weakened vessel that ruptured usually because of uncontrolled blood pressure or hypertension (American Stroke Association, 2013).

1.6.4 Hypertension

Hypertension is defined as a persistent elevation of arterial blood pressure which systolic blood pressure is more than 140 mmHg while diastolic blood pressure is more than 90 mmHg (Al-Ramahi, 2014).

1.6.5 Drug Compliance and Knowledge in Stroke Prevention among Hypertension Patient

The drug compliance and knowledge in stroke prevention among hypertension patient means that how hypertensive patient's knowledge correspond to the level of drug compliance. At the same time it also assessed patient on stroke prevention knowledge.

1.7 Significance of the Study

This study will determine the drug compliance and knowledge in stroke among hypertension patient at Hospital Universiti Sains Malaysia. It is important to do research in this area because the findings will contributed to the patients, nurses, physician and hospital organization.

Lowering blood pressure by antihypertensive drug reduces the risk of cardiovascular events, stroke and total mortality. However, poor compliances to antihypertensive drug reduce their effectiveness and increases the risk of adverse events especially stroke and healthcare cost. It is highly needed to know the rate of drug compliance and the factor related to it to implement strategies and intervention to improve the situation. Compared to the other aspect that considered in therapeutic or management of disease such as having healthy lifestyle, prevent stress and so on, drug compliance has been given minor attention although it affects every aspect of medical care.

The study in this area will promote understanding about drug compliance to hypertensive patients. Furthermore, we can review and assess hypertensive patient knowledge on drug compliance and their drug regime. Assessment of the score knowledge in stroke prevention is significant because patient have greater risk of having stroke. This study will be helpful for health policy to implement health education strategies in order to reduce non-compliances and thus reduce healthcare cost and can assess the effectiveness of previous health programme before this.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, the literature reviews consists of studies of drug compliance and knowledge in stroke prevention. On top of that, association of age with levels of drug compliance and association of educational levels with knowledge in stroke prevention was also be review. Hypertension, is the single most important risk factor for stroke. It causes about 50 per cent of ischemic strokes and also increases the risk of hemorrhagic stroke (World Heart Federation, n.d).

People who have hypertension that does not compliances to their drug are at higher risk of developing cardiovascular complications such as heart attacks, heart failure, kidney damage and stroke compared to people with normal blood pressure. Hypertension cannot be cure but can be controlled by life style changes or if necessary by medication. When changing lifestyle does not help control blood pressure, the doctor may prescribe medications (American Heart Association, 2013).

On the other hand, stroke affects the blood vessels that supply blood to the brain. A stroke occurs when a blood vessel to the brain is either blocked by a clot (ischemic stroke) or bursts (hemorrhagic stroke). When that happens, part of the brain is no longer getting the blood and oxygen it needs, so it starts to die. The hypertension cause a stroke by damages arteries so they burst or clog more easily (American Heart Association, 2013).

2.2 Review of Literature

2.2.1 Drug Compliance

Several studies has been conducted in different parts of the world to measure the rate of patient compliance to hypertension medication. A study by Azuana (2012) use cross-sectional, multicenter study that was conducted in all seven Ministry of Health Primary Health Clinics in the District of Hulu Langat in Selangor. Adherence was measured using a validated survey form for medication

compliances consisting of seven question. A retrospective medication record reviewed was conducted to collect and confirm data on patient demographics, diagnosis, treatment and outcomes. At different places, a study conducted by Saleem et al., (2011) in Pakistan also used a cross-sectional study. Two validated questionnaires (Hypertension Fact Questionnaire and Drug Attitude Inventory) were used for data collection.

The inclusion criteria on Azuana (2012) study was enrolled by using systematic random sampling. Patients included in the study were 30 years old or older and had been diagnosed with essential hypertension for at least six months. Patients who had secondary hypertension, who were pregnant, who had incomplete patient medical records or who were on other drugs that could increase blood pressure were excluded from the study. The inclusion criteria by study of Saleem et al., (2011) was patients that at least aged 18 years old, confirmed diagnosis of essential hypertension, those using antihypertensive agents for the last six months, and ability to speak and write in Urdu, the national language of Pakistan. The exclusion criteria were patients aged less than 18 years old and more than 80 years old, patients with co-morbidities, immigrant from other countries and pregnant women.

On other study by Hassan et al. (2006) claimed that poor medication compliances was frequent in hypertensive patient at Family Medicine Clinic, Hospital Universiti Sains Malaysia, Kelantan and the overall noncompliance rate measured in the study was consistent with other study. The medication noncompliance rate was 55.8 % for total 240 hypertensive patients whereas study by Azuana (2012) reported good adherence was observed in 53.4 % of the 653 patient sampled. Other study by Al-Ramahi (2014) found that the adherence that has been observed in Pakistan was higher (77.0 %) than what has been reported in Malaysia (44.2 %).

Besides that, a study from Baroletti & Dell'Orfano (2010) claimed that compliance is a dynamic phenomenon and its degree may vary over time, place and population whereas study by Wong, Jiang, & Griffiths (2010) implies that non-compliance to antihypertensive drugs remained high worldwide.

2.2.2 Knowledge in Stroke Prevention among Hypertensive Patients

Several studies also had been conducted to assess the knowledge on stroke prevention. The purpose of research done by Nakibuuka et al., (2014) was designed to complement large population survey on prevalence of stroke risk factors, assessed knowledge and perception of stroke and associated factors. The method of population survey was conducted in urban Nansana and rural Busukuma, Wakiso district, central Uganda. Adult participants was selected by multistage stratified sampling were interviewed by about selected aspects of stroke knowledge and perception in a pretested structured questionnaire. The result from this study is that there were 1616 participants that ¾ over them did not know any stroke risk factors and warning signs or recognize the brain as the organ affected. The researcher conclude that knowledge about stroke in Uganda is poor although the planned response to the stroke event was adequate.

On the other hand, a study by Müller-Nordhorn et al., (2006) was done in order to increased knowledge of stroke risk factors in the general population that may lead to improved prevention of stroke. The objective of the present study was to assess knowledge of stroke risk factors and to determine factors associated with knowledge. Researcher run the study in a population-based survey by sent a questionnaire to randomly selected residents in Berlin who were 50 years old, enquiring about knowledge of stroke risk factors. A total 28090 of 75720 residents responded to the questionnaire. Of all respondents, 68 % were able to name more than one correct stroke risk factor and 13 % named four correct risk factor. The conclusion of the study made was the health educations programs to increase knowledge about stroke risk factors should focus on population groups at risk for lack of knowledge.

2.2.3 Measurements of Patients' Drug Compliance and Stroke Prevention among Hypertension Patient

The research instrument in this study was adapted from two resources (Azuana et al., 2012 & Falavigna et al., 2009). It was organized into three parts

which are: 1) Socio-demographic data (10 items), 2) Drug compliance assessment (7 items), and 3) Knowledge of stroke prevention among hypertensive patient (5 items).

The original instrument regarding drug compliance of hypertension patient was adopted by Azuana et al. (2012), from study of medication adherence among hypertensive patients of primary health clinics in Malaysia. The original instrument representing three dimension of part which is socio-demographic data, clinical characteristic of disease such as blood pressure and duration of hypertension followed by last part is regarding the drug compliance. On the other hand, the level of stroke prevention knowledge was adopted by Falavigna et al. (2009) , from study of awareness of stroke risk factors and warning signs in Sourthern Brazil. Knowledge was assessed in a multiple choice answer consist of five items. The assessment will contribute by ability to know organ that affected due to stroke, risk factor associated and sign and symptoms present. These two instrument was chosen because it comprise all the criteria that needed in these study.

2.2.4 Association of Socio-demographic Data (Age, Gender, Education Levels) with Levels of Drug Compliance

There are many factors that may affect the compliance to medication include factors of age, gender, educational level, socioeconomic state, class of drug prescribed, number of pills per day, number of dose per day, and the presence of comorbid condition (Ross, Walker, & MacLeod, 2004). Ross et al., (2004) claimed that older age is associated with good compliance for patients with hypertension compare to younger patient. However, the results reported in previous studies have not been consistent.

In two studies, elderly were found to be less compliant. In another study, older patients were found to be more compliant than younger patients with newly diagnosed hypertension (Azuana et al., 2012). Hashmi et al., (2007) study find subjects who were less than 40 years old were less adherent than those older than 70. The study also claimed that age was found to be significantly and independently associated with compliance, with better adherence in older people.

2.2.5 Association of Socio-demographic data with Knowledge in Stroke Prevention

There are study that done in order to assessed knowledge in stroke prevention. The study is important in order to encourage knowledge in risk factor of stroke, warning symptom of stroke and prevention of stroke. Nakibuuka et al., (2014) study said that there is a lack of knowledge about stroke among the public even in developed countries such as United States.

But there is potential to opportunities to improve general knowledge especially among those at high risk for stroke and low level of education thus help individuals in the future both reduce stroke risk and reduce complications of stroke.

Other study conducted by Vibo et al., (2013) find that better knowledge in stroke among subjects with higher education. The research was undertaken to assess stroke awareness among Estonian population. It conducted by subject that asked to fill in an original, close-ended multiple choice questionnaire about the definition, risk factors of stroke, symptoms and behavior at the onset of stroke. Subject are randomly choose in public places of the two biggest cities in Estonia which is Tallinn and Tartu. The study that include 355 persons find that most of the subject knew that stroke is an acute disease and that one should call the ambulance at onset of stroke. It found that there were no differences between sexes, but advanced age and higher level of education were related to higher awareness.

2.3 Conceptual/Theoretical Framework

The theoretical framework for this study is based on the health belief model by Hochbaum (1958).

The Health Belief Model (HBM) is by far the most commonly used theory in health education and health promotion (Glanzz, Rimer & Lewis, 2002). The underlying concept of the original HBM is that health behavior is determined by personal beliefs or perceptions about a disease and the strategies available to decrease its occurrence (Hochbaum, 1958).

The health belief model holds that individual perceptions and modifying factors are predictors of the likelihood of action (Figure 1). Patients' choice to make a healthy change is motivated by their knowledge about the risks of susceptibility towards the disease and knowledge about the seriousness of the disease. Patients' willingness to change usually influences by their understanding of the benefits of change and of their perceived of the barriers to change. After a person has had a hypertension, they need to be aware of the threat or seriousness of their risk to get a stroke.

Thus, patient-center strategies may lead to the identification of better tools to improve knowledge and lifestyle changes after stroke. Specifically targeted programme may be beneficial to the stroke population if they are individually designed (Roden, 2004). Even though improved patient knowledge do not guaranteed behavioral changes. However, poor knowledge does not necessarily lead to nothing of behavioral changes at all.

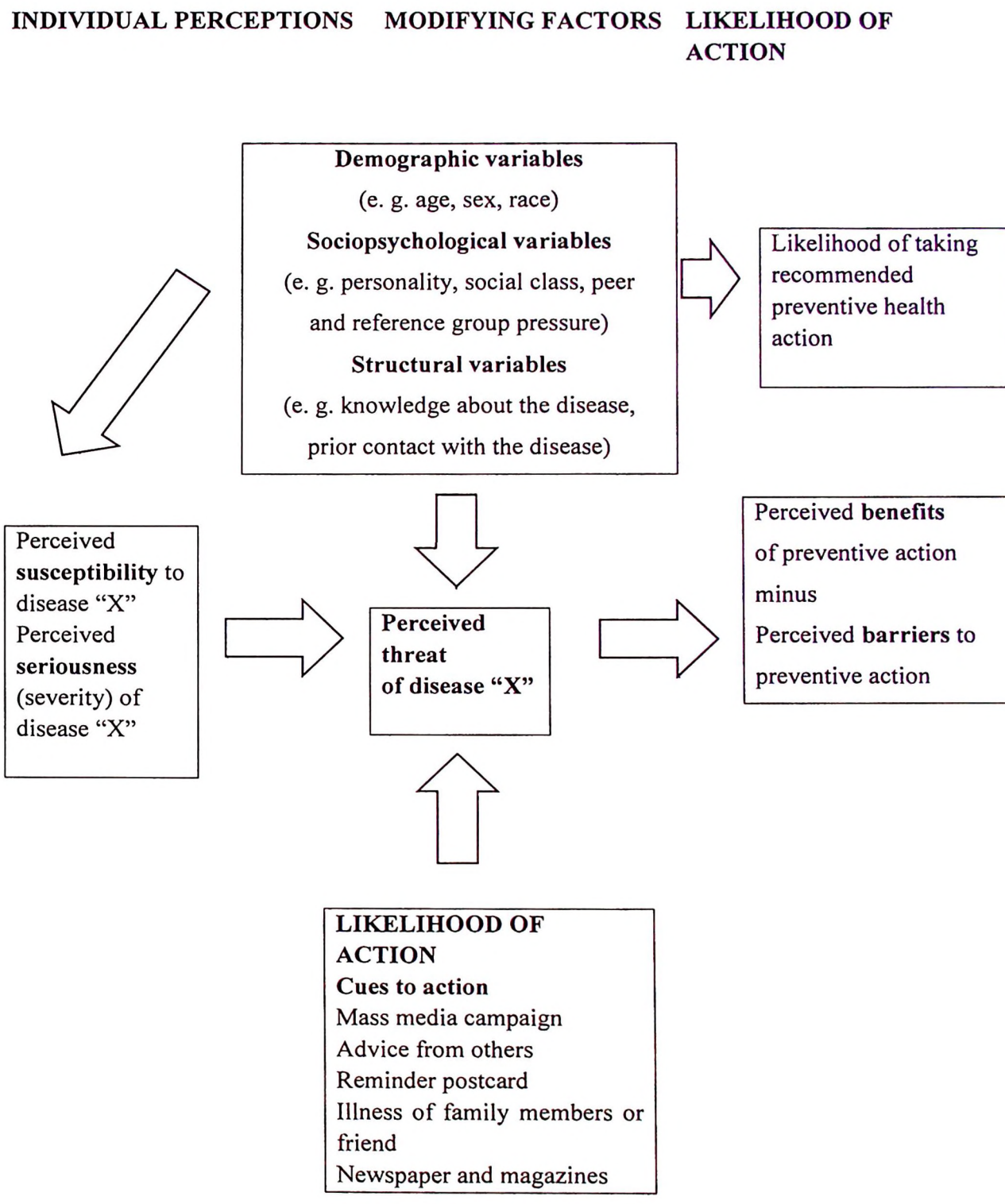

Figure 1.1: Health Belief Model (Adopted from Rosentok, 1974)

Personal risk or susceptibility is one of the more powerful perceptions in prompting people to adopt healthier bahaviors. The greater they perceived risk, the greater the likelihood of engaging in behaviours to decrease risk. Despite, it is only logical that when people believe they are at risk for a disease, they will be more likely to do something to prevent it from happen. Unfortunately, the opposite also occurs. When people believe they are not at risk or have a low risk of susceptibility, unhealthy behaviors tend to result (Maes & Louis, 2003).

Besides, when the perception of susceptibility is combined with seriousness, it results in perceived threat. If the perception of threat is to a serious disease for which there is a real risk, behavior often changes (Glannz, Rimer & Lewis, 2002). The construct of perceived benefits is a person's opinion of the value or usefulness of a new behavior in decreasing the risk of developing a disease. People tend to adopt healthier behaviors when they believe that new behavior will decrease the chances of developing illness. Besides, perceived benefits play an important role in the adaptation of secondary prevention behaviors (Frank & Swedmark, 2004). The drug compliance and knowledge in stroke prevention may be influenced by educational level of the patient.

Since change is not something that come easily to most people, the last construct of the HBM is the issue of perceived barriers to change. This is an individual's own evaluation of the obstacles in the way of him or her adopting a new behavior. Of the entire construct, perceived barriers are the most significant in determining behavior change (Janz & Becker, 1984). In addition to the four beliefs or perceptions and modifying variables, the HBM suggest that behavior is also influenced by cues to actions. Cues to action are vents, people, or things that move people to change their behavior (Graham, 2002)

In 1988, self–efficacy was added to the original four beliefs of the HBM (Rosenstok, Strecher & Becker, 1988). Drug compliance is influence by patient self-efficacy to adhere to the drug regime. If someone believes a new behavior is useful (perceived benefit) but does not think that he or she is capable of doing it (perceived barrier), there are possibility that they will not try. Below is the conceptual framework to study the drug compliance and stroke prevention among hypertension patient adopted from Health Belief Model.

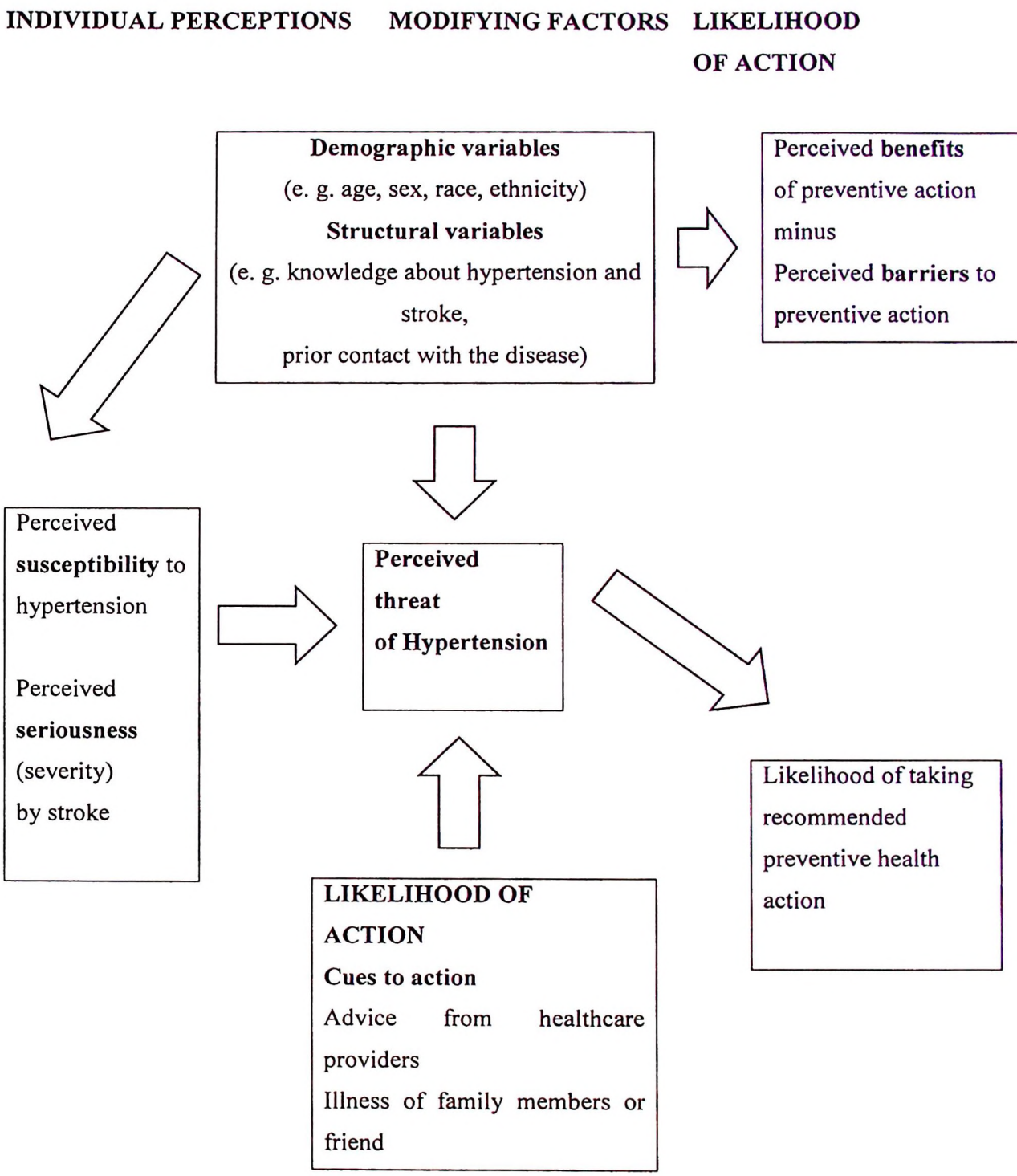

Figure 2.1: Conceptual Framework of Health Belief Model

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research Design

The study will used a cross-sectional descriptive design to determine the drug compliance and knowledge in stroke prevention among hypertensive patients at Hospital Universiti Sains Malaysia (Hospital USM). Then, the data will be collected from December 2014 until February 2015.

3.2 Population Setting

The target populations are hypertensive patients who were follow up treatment at Klinik Pakar Perubatan (KPP) at Hospital Universiti Sains Malaysia (Hospital USM), Kubang Kerian, Kelantan during December 2014 until February 2015.

3.3 Sample

3.3.1 Sample size

The sample size was calculated based on sample size calculation of one proportion estimation. The proportion (p) was put at 53.4%, with precision of 10.00%. The significance level (α) was 0.050 with drop out of 10%. The sample size recorded is 96 with corrected sample size is 107. So, the total samples were 107 patients.

3.3.2 Sampling Design

This study will used convenience sampling method. For this sampling method, hypertensive patient who were follow up treatment at KPP, Hospital USM during December 2014 until February 2015 and were select base on the inclusion and exclusion criteria.

3.3.3 Inclusion and exclusion Criteria

Inclusion Criteria:

1. Hypertensive patients who were follow up treatment at Klinik Pakar Perubatan (KPP) at Hospital Universiti Sains Malaysia (Hospital USM).
2. Age 18 years old and above.
3. Hypertension patient who understand and has acceptable knowledge of the chosen language of questionnaire (Bahasa Malaysia).
4. Patients who agreed to participate in the research.

Exclusion Criteria:

1. Patient who have difficulty in understanding the questionnaire or communicate in Malay.
2. Patient who having stroke.

3.4 Instrumentation

3.4.1 Instrument

A structured questionnaire will be used in order to gather information on identifying drug compliance and knowledge in stroke prevention among hypertension patient at HUSM. This questionnaire consists of three part.

Part 1: Consisted of socio-demographic data which comprise of gender, age, races and level of education. This information provides background about the patient and it is used to determine the association of socio-demographic data with drug compliance and knowledge in stroke prevention. Some clinical characteristic will also be ask at this part such as duration of hypertension, history of hypertension and stroke in family, history of smoking, exercise and knowledge in normal blood pressure level.

Part 2: Consisted seven modified question from Azuana et al. (2012) rated by likert scale types of answer either all of the time (1), most of the time (2), some of the time (3) and none (4). The total score will evaluate by

compliance with 28 score or 27 (if there is unintentional question from no 1 to 6). 26 and below was categorized as non-adherent.

Part 3: Consisted question from Falavigna et al. (2009) that assess the knowledge of stroke prevention among hypertension patients. The knowledge of stroke prevention was assess by the ability of patient to detect the organ affected by stroke, the risk factors of stroke and sign and symptom of stroke. There is also question to ask the first action taken if someone near having stroke and how patient obtain stroke information. All of the question was provided with multiple choice answer.

3.4.2 Variables Measurement

This study has identified two different variable, which are dependent variable and independent variable. The variables and measurement are as follow:

Dependent variables : Drug compliance and knowledge in stroke prevention among hypertensive patients.

Drug compliance was assess by Likert type of answer. There are four response provided which is all of the time (1), most of the time (2), some of the time (3) and none (4). The total score will evaluate by compliance with 28 score or 27 (if there is unintentional question from number 1 to number 6). 26 and below was categorized as non-adherent.

Knowledge in stroke prevention was assess by three important items which is an ability of patients to detect organ affected due to stroke, risk factor of stroke and sign and symptom of stroke.

Independent variables: Socio-demographic data:

1. Age (Numerical measurement),
2. Educational level (Categorical measurement),
3. Gender (Categorical measurement)

3.4.3 Translation of Instrument

The original instrument of modified Medication Adherence Scale by Azuana et al. (2012) have been translated into Malay language. On the other hand, the original instruments of knowledge in stroke prevention by Falavigna et al. (2009) was developed in the English language. For this study, the English version of the instrument had been translated into the Malay language. The instrument was translated to a new version by using forward and backward translation and checked by a bilingual expert from Pusat Pengajian Bahasa Literasi dan Terjemahan, Universiti Sains Malaysia (USM). Then, the translated version checked by supervisor and correction had been done and validated.

3.4.4 Validity and Reliability

Validity of the Questionaire

The validity and reliability are important in the data collection instrument in order to make sure the respondents are treats ethically. The instrument had been validated by three content expert so that the instrument is enough with relevant questions covering all aspects being studied. Besides, the questions must reflect the concepts being studied and that the scope of the questions is adequate and in the manner.

Reliability of the Questionaire

The instrument was a combination of two questionnaires adapted from Azuana et al. (2012) and Falavigna et al. (2009). A pilot study had been conducted to test the reliability of the questionnaire to make sure it was understandable and acceptable. The reliability of the new Medication Adherence Scale had Cronbach's α of 0.782.

3.5 Ethical Consideration

In order to protect the rights of human subject and also to achieve basic principles of ethical concern, certain procedures had been informed prior to conduct this study which include:

1. Ethical approval from the Ethical Committee Universiti Sains Malaysia (USM) were obtained.
2. Permission from Director of Hospital Universiti Sains Malaysia were obtained to conduct this study.
3. Written consent from patients at had been requested and obtained.
4. The purposes of the study to the eligible subjects were explained by researcher. Subjects who was willing to participate in the study were given a written consent. They were informed that they had a right to stop or discontinue for any reason without fear of any negative consequences.
5. Researcher identity were inform to the patients before get the permission from them to participate in the research. They were anonymity for all information given and the use of such information will be for the purpose of study only. The subjects were inform that the study will not give any harm to them since there is no invasive procedure involved. All information given by the subjects were kept as a secret by the researcher. In addition, the subjects were explained that their identity is remaining confidential.

3.6 Data Collection Methods

1. After ethical approval obtained from the Research Ethical Committee (Human) Universiti Sains Malaysia (USM) and permission for data collection were permit from the Director of Hospital USM, subjects who meet the inclusion criteria were approach and patient who willing had verbal or written consents are obtained from them
2. After the consent had given to the subjects, the subjects were handed a structured questionnaire and a brief instruction on how the questionnaire should be completed were given. The subjects were asked to complete questionnaire approximately 30 minutes.
3. The researcher had checked the completeness of the questionnaire. If there is any of questionnaire not answer, the researcher had ask the subjects to fill the missing answer.
4. Data collections are carry out from December 2014 until February 2015 (Figure 3). There were 107 patients recruited for this study.

3.6.1 Flow Chart of Data Collection

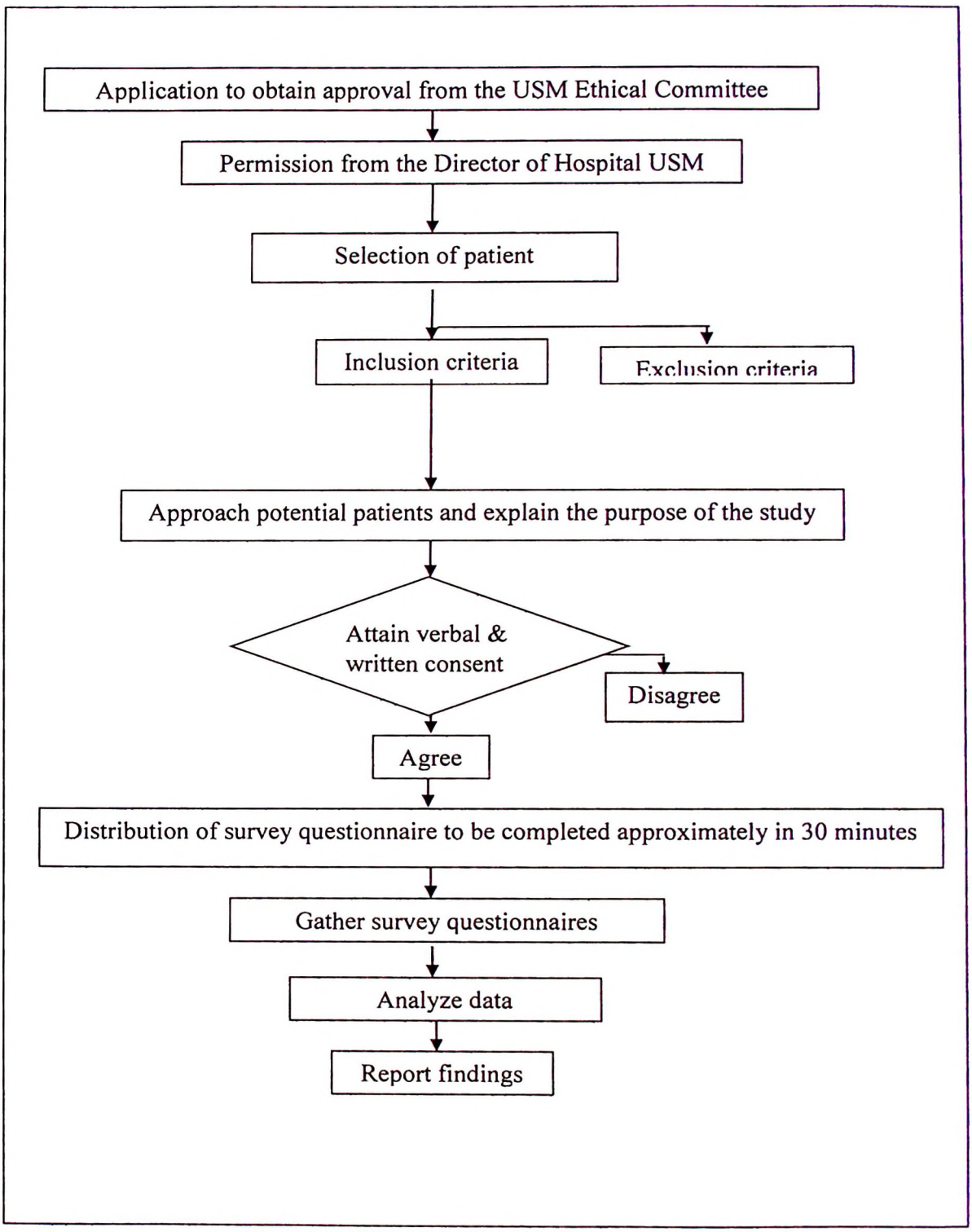

Figure 3.1: Flow Chart of Data Collection