The Effectiveness of brief pre- discharge smoking cessation counseling among smokers hospitalised in medical and surgical ward Hospital Universiti Sains Malaysia

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Dissertation submitted in Partial Fulfillment of the Requirement for the Degree of Master of Medicine (Family Medicine)

UNIVERSITI SAINS MALAYSIA

ACKNOWLEDGEMENT

Praise be to Allah s.w.t the Most compassionate and Most merciful, whose blessing has helped me throughout this from beginning until completion of the study. I would like to express my highest gratitude to the following important persons who involved in this study from beginning until the end.

1. Dr Rosnani Zakaria and Dr Imran Ahmad as my supervisor and co-supervisor for this study. Both of them are lecturer at Department of Family Medicine, who have been very patient and helpful. Their precious time and guidance were appreciated throughout this journey.

2. Dr Faridah Bt Mohd Zin, Lecturer, Department of Family Medicine and Dr Nik Azhan,B Nik Mohamad Family Medicine Specialist, Klinik kesihatan Bachok who help me to review the module of brief Smoking cessation for hospitalized patient. Without their help, it is difficult for me to produce the Module.

3. Associate Professor Dr Norhayati Mohd Noor, Lecturer, Department of Family Medicine, who has helped in formulating and analyzing the data. This study will not complete without her guidance.

4. My special appreciation to all my colleagues and lecturers in Department of Family Medicine, School of Medical Sciences, Universiti Sains Malaysia who involved indirectly in this study.

Last but not least, thank you to my beloved parents and family who have been very supportive and patience in waiting me completing this dissertation.

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LIST OF ABBREVIATIONS

HUSM : Hospital Universiti Sains Malaysia

GATS : Global Tobacco Survey

FCTC : Framework Convention on Tobacco control

NICE : National Institute for health and Clinical Excellence

ABSTRAK

KEBERKESANAN MODUL KOUNSELING RINGKAS KE ATAS PEROKOK YANG DIMASUKKAN KE WAD PERUBATAN DAN PEMBEDAHAN HOSPITAL UNIVERSITI SAINS MALAYSIA

Latar belakang: Tabiat merokok merupakan punca utama kematian yang boleh dielakkan dan kebanyakan kemasukan pesakit ke wad adalah disebabkan oleh penyakit yang berpunca dari tabiat merokok. Hospital menyediakan suasana yang terbaik bagi melakukan intervensi kepada perokok yang dimasukkan ke wad terutamanya pesakit yang mempunyai masalah kesihatan disebabkan merokok. Modul kaunseling ringkas dicipta agar ianya senang disampaikan oleh pengamal perubatan dan ia tidak memakan masa yang lama.

Objektif: Menentukan faktor-faktor yang menyumbang kepada ketagihan nikotin dan mengkaji kaitan antara ketagihan nikotin dan penyakit yang disebabkan oleh tabiat merokok. Tahap keberkesanan modul kaunseling ringkas terhadap pesakit yang dimasukkan ke wad juga akan ditentukan.

Kaedah: Fasa pertama adalah kajian keratan rentas terhadap 94 pesakit yang dimasukkan ke wad perubatan dan pembedahan HUSM. Data socidemografik diambil dan tahap ketagihan nikotin dikira bagi setiap peserta kajian menggunakan skor Fagerstrom yang telah diterjemah ke Bahasa melayu. Data telah dianalisa menggunakan ujian ‘Simple and Multiple linear regression’ untuk menentukan factor yang menyumbang kepada ketagihan nikotin dan ujian ‘Simple and Multiple confirmatory analysis’ telah dilakukan untuk mengkaji kaitan antara ketagihan nikotin dan penyakit yang disebabkan oleh tabiat merokok.

Fasa kedua kajian adalah kajian ‘randomize control trial’ di mana kesemua 94 pesakit dari fasa pertama telah dibahagikan secara rawak kepada kumpulan kajian dan kumpulan kawalan. Kumpulan

kajian (n=46) menerima kaunseling ringkas dan pamphlet manakala kumpulan kawalan hanya menerina rawatan biasa (usual care). Kesemua pesakit dinilai tahap kesediaan untuk berhenti merokok menggunakan ‘Proscha’s transtheoretical model of change’ ketika temujanji sebulan selepas intervensi.data kajian dianalisa menggunakan ujian ‘Chi square’.

Keputusan: Kadar respons kajian adalah 98%. Data sociodemographic (umur, pekerjaan, pendapatan dan tempoh berada di hospital) adalah faktor yang tidak signifikan terhadap ketagihan merokok. Tiada kaitan yang signifikant antara tahap ketagihan merokok dan penyakit disebabkan tabiat merokok. 65% pesakit daripada kumpulan kajian menunjukkan perubahan motivasi ke arah berhenti merokok manakala hanya 46% pesakit dalan kumpulan kawalan yang menunjukkn perubahan. Walaubagaimanapun, keputusan daripada ujian Chi square adalah tidak signifikant (P=0.065).

Kesimpulan: Lebih banyak faktor pembolehubah diperlukan untuk melihat kaitannya dengan tahap ketagihan nikotin. Modul kaunseling ringkas dapat memotivasikan perokok yang dimasukkan ke wad untuk berhenti merokok, walaubagaimanapun cara kajian yang sedikit berbeza mungkin diperlukan untuk mendapatkan keputusan yang lebih baik.

Kata kunci: Kaunseling, Berhenti merokok, Perokok, Hospital, Nikotin.

ABSTRACT

THE EFFECTIVENESS OF BRIEF PRE- DISCHARGE SMOKING CESSATION COUNSELING MODULE IN CURRENT SMOKERS HOSPITALISED IN MEDICAL AND SURGICAL WARD HOSPITAL UNIVERSITI SAINS MALAYSIA

Background: Cigarettes smoking is a leading preventable cause of death worldwide and the main cause of hospitalization was due to smoking related illness. Hospitalisation provides a good environment for smoking cessation. Brief smoking cessation counseling was created as it can be delivered by healthcare professional and are not time consuming.

Objectives: To determine the associated factors for nicotine dependence and association between nicotine dependence and smoking related illness. The effectiveness of brief pre- discharge Smoking Cessation counseling for hospitalised patient in Hospital Universiti Sains Malaysia was also determined.

Methodology: Phase one study was a cross sectional study done to 94 patient who was admitted to medical and surgical ward HUSM. Sociodemographic data was obtained and nicotine dependence for each patient was calculated using Malay version of Fagerstrom score form. Data was analyzed using simple and multiple linear regression to know the associated factor for nicotine dependence and Simple and multiple logistic confirmatory test was done to determine association between nicotine dependence and smoking related illness.

Phase two study was a randomize control trial where the same 94 patients from phase one study was randomized into intervention and control group. Intervention group (n=46) received brief intervention and pamphlet regarding stop smoking whereas control group (n=48) just receive usual care. All

patients were given one month follow up to assess their readiness to change using Proscha's transtheoretical model of change. Result was analyzed using Chi square test.

Result: Response rate of the study was 98%. Sociodemographic data (age, job, income and duration of hospital stay) are not significant associated factor for nicotine dependence. There are no significant association between nicotine dependence and smoking related illness. 65% patient from intervention group had change their motivation towards smoking cessation compare with only 46% of control group who change. However, result from Chi square analysis was not significant (P=0.065).

Conclusion: More variables are needed to the study associated factors of nicotine dependence. Brief counseling module may motivate precontemplation hospitalised smokers to stop smoking. However different approach may be needed to get a better result.

Keywords: Counseling, Smoking cessation, Smokers, Hospitals, Nicotine

CHAPTER 1: INTRODUCTION

1.1 Overview of Smoking problems in Malaysia

Cigarette smoking is the leading of preventable cause of death in the world. Tobacco use causes more than 5 million deaths per year worldwide. Most of the death occurs in low and middle-income country. By the year 2030, there will be more than 8 million deaths worldwide each year and 80% of the death occurs in low and middle- income country if the current trend of smoking continues (WHO, 2011, 2013). Report from several studies in United State, cigarette smoking causes one in five deaths. It also causes more deaths each year than all of this disease combined (illegal drug use, alcohol use, motor vehicle accident and HIV) (Mokdad *et al.*, 2004; CDC, 2017). There are diseases that are synonym to cigarettes smoking behavior such as chronic obstructive pulmonary disease, Lung cancer, myocardial infarction and stroke. 90% of death due to lung cancer are caused by cigarettes smoking (U.S, 2014).

In Malaysia, Global tobacco survey (GATS-Malaysia) 2011 reported that 43.9% of men, 1% of women and 23.1% overall (4.7 million adults) currently smoke tobacco (Ministry of health, 2011). They also reported that 39.9% of men, 0.7% of women, and 20.9% overall (4.3 million adults) currently smoked tobacco daily. Numbers of smokers shows the same trend in Kelantan, as the prevalence of current smokers was 21.5% in year 2004 as reported by Rampal *et al* (Rampal L, Aziz SI, Razin A, 2004). However, in Kelantan, prevalence of smokers is significantly high among male compare to female.

Individual smoker spent average of RM 10 daily to buy cigarette(Ministry of health, 2011). This will make smokers spent about RM300 per month and RM4600 per year just to buy cigarettes. Within 10 years, smokers spent RM 46 000 for their risky habit. 7% of smokers

who spend their money to buy cigarettes did not have enough money to buy foods as stated in GATS Malaysia survey 2011, shows that smoking tobacco causes significant economic burden to the smokers.

Aware of the burden and increasing number of smokers and death due to smoking habit, aggressive and efficient intervention need to be done to encounter the problems. All people from every level of society must unite to make the smoking cessation campaign success.

1.2 Burden of smoking related illness

Cigarettes smoking significantly cause morbidity and mortality. In Malaysia, 20.3% of 2016 hospitalization was due to smoking related illness (disease of circulatory and respiratory system) (Ministry of health, 2016). 20.1% of mortality in year 2016 was due to ischemic heart disease and cerebrovascular disease as reported by Malaysia statistical department (*Department of Statistics Malaysia Official Portal*, 2017).

Tobacco smoke contains more than 7000 chemical and at least 250 chemicals are known to be harmful to our body include cyanide, carbon monoxide and ammonia (U.S, 2014). This chemical can harm most organs in the body and can cause at least 69 types of cancer such as lungs, esophagus, larynx, mouth and stomach cancer. Smoking also causes heart disease (ischemic heart disease, aortic aneurism) stroke and affects the lungs. Chronic obstructive airway disease (emphysema and chronic bronchitis) is known lung pathology causes by chronic smoker. Men who smoke is at high risk to have erectile dysfunction (Austoni *et al.*, 2005) and pregnant women who smoke are at risk to have low birth weight infant, still death and premature delivery.

Smoking also cause bad outcomes for patients who undergo surgical procedure. There are strong evidence that smokers who undergo surgery have a higher risk of lung and heart complications, higher risk of post-operative infection, impaired wound healing, more likely to be admitted to an intensive care unit, increased risk of dying in hospital, higher risk of readmission and tend to remain in hospital longer(Delgado-Rodríguez *et al.*, 2003; Myers *et al.*, 2011). Smoking is the single most important risk factor for the development of serious post-operative complications in patients undergoing elective hip and knee replacement. It also causes higher rate complication of foot and ankle surgery, particularly non-union (Ishikawa *et al.*, 2002). That is why certain procedure and operation is not being done if the patient did not stop smoking.

Looking at the increasing of smoking related illness and hospitalization, there is need for smoking intervention programmed to be conducted inside hospital where smokers could see the effect of their own wasteful and hazardous habit.

1.3 Smoking cessation programs in Malaysia

The vision of Malaysia's tobacco control Program is by the year 2020, Tobacco will no longer be a major public health concern in Malaysia and one of the objective is to increase the number of smokers giving up smoking. In a way to achieve that, Malaysia has become a Party to WHO Framework Convention on Tobacco control (FCTC) since December 15th, 2005. It is an international legal tool to restrain global tobacco epidemic and to protect health of the public. WHO FCTC implemented MPOWER (Monitor tobacco use, Protect, offer help,

Warn, Enforcement of tobacco bans and Raise tax) package that has been used in Malaysia as a strategy to reduce smoking prevalence (WHO, 2013; tobaccocontrollaws, 2017)

Under article 14 WHO FCTC guidelines, members need to offer help to quit smoking. There are more than 300 quit smoking clinics under ministry of health and more than 30 government hospital offered quit smoking services. Promotion of availability of quit smoking services was done extensively involving all doctors, nurses, Pharmacist, dentist and health personnel. There are also Quitline available for smokers to help quit smoking. It was conducted under National Poison center Universiti Sains Malaysia. Campaign on promoting healthy lifestyle and discouraging smoking has been done by government and non-government unit. The example of the campaign was, 'Tak Nak Merokok' media campaign, healthy lifestyle campaign and 'Nafas baru bermula Ramadhan' campaign during fasting month.

There are also Smoke free areas implemented in Malaysia as being advice from article 8 WHO FCTC guidelines to protect people especially from second hand smoke and to create a healthy environment without smoke. Smoking is generally prohibited in public transport, air conditional working area, hospitals, schools, recreational area and there will be many more area will be listed under smoke free area. Those caught smoking at smoke free area will face a maximum fine of RM10,000 or up to two years imprisonment under The Control of Tobacco Product (Amendment) Regulations 2017(tobaccocontrollaws, 2017).

Programs for smoking cessation seems not enough in Malaysia as smoking prevalence still high and cigarettes are still easily available at convenience store or restaurants. Therefore, study of new intervention and programs need to be done to achieve target of less than 5% of smoking prevalence by the year 2045 (National strategic plan of tobacco control vision).

1.4 Rationale of the study

Studies showed that smokers two times more prone to get admitted to hospital compared to non-smokers. Hospital is one of the proven places where people manage to do smoking cessation intervention (Emmons and Goldstein, 1992; Nancy *et al.*, 1997). A hospital stay may provide a good place for smoking cessation intervention because it is the smoke free area and can give the opportunity for patient to abstain away from usual cues to smoke (Nancy *et al.*, 1997; France *et al.*, 2001). The receptivity to stop smoking is higher especially in patient with tobacco related illness such as coronary heart disease, lung disease and certain cancer. Most of the hospital policy (including HUSM) prohibited smoking in ward and hospital area, that makes hospital stay as a suitable place for patient to practice and consider for smoking cessation.

Hospitalization also provides a unique opportunity for doctors and health care professionals to intervene with smokers. During the period of illness, patients become more vulnerable to accept advice and knowledge regarding the dangerous of the smoking habit. However, available data suggest that most smokers are not even being advice to quit smoking during their hospitalization (Emmons and Goldstein, 1992; Neighbor, Stoop and Ellsworth, 1994). In Malaysian clinical practical guidelines (CPG) on treatment of tobacco dependence 2017 advice all the smokers who is hospitalised to be given counseling and treatment (Health, 2017). Smoking cessation intervention in hospitalised patient setting are still not fully being practiced in our hospital, especially in Malaysia and HUSM. A few studies show that smoking intervention delivered during hospitalised period is effective. Intense counseling and behavioral support has been shown to be effective in hospitalised patient with

cardiovascular disease(Taylor *et al.*, 1990; DeBusk *et al.*, 1994), however it is logistically difficult and time consuming to deliver as a routine service for all smoking patient. Less intensive or brief counseling is more suitable for general application in ward as it can be given by all doctors and nurses in ward. A systemic review study done by M Munafo et al also shows that smoking cessation intervention delivered during hospital period with follow up at least one month after discharge with or without Nicotine replacement therapy is equal to the use of Nicotine replacement alone in other population. Therefore, it could increase smoking cessation rate (Munafò *et al.*, 2001).

Due to cost and time constrain, brief counseling is being chose in this study. The Brief counseling can be delivered by doctors, nurses and other healthcare professionals in the ward. Studies shows that Brief Smoking cessation counseling by staff nurse provides significant increase successful of quit smoking among hospitalised patient with cardiac disease (Nancy *et al.*, 1997; Johnson *et al.*, 1999). Providing brief smoking cessation advice to hospitalised smoker is also relatively inexpensive, cost effective and should become part of standard inpatient care (Meenan *et al.*, 1998). In this study, the effectiveness of brief counseling will be assessed by the motivation of the patient toward smoking cessation after the counseling. Hopefully due to the illness and the help from hospital environment, patient who are difficult to stop smoking will get some benefit and motivated to stop smoking in the future.

We certainly hope that someday the module that we made will be used as part of standard care for hospitalised patient who smoke to help them quit smoking.

CHAPTER 2: LITERATURE REVIEW

2.1 Effect of smoking cessation after hospitalization.

Smoking is a modifiable risk factor for morbidities like cardiovascular disease, lung disease and cancers. There are many admissions to hospital each year due to effect of smoking, therefore smoking cessation is part of the strategy in managing patient with disease mainly associated with cigarette smoking. Dedicated patient who stop smoking after getting the disease may get much benefit of their health and quality of life. After 24 hours of smoking cessation, heart rate will be normalized and blood pressure will be improved (Jane and Don, 2011). Carbon monoxide level in blood will begin to decline in few hours after stop smoking and sense of smell and taste will also improve after 48 hours.

Smoking cessation also had good long-term effect and outcome to people who already had diseases. For cardiovascular disease patient, after one year of smoking cessation, risk of another cardiac event and myocardial infarction is 50% lower compare to patient who continues to smoke (Health, 1990; Jane and Don, 2011). After 5-15 Years of smoking, risk of stroke and coronary heart disease normalized to people who never smoke. In Survival and Ventricular Enlargement (SAVE) study, Smoking cessation after 6 months follow up patient with left ventricular dysfunction following Myocardial infarction (MI) shows it reduce all cause of mortality by 43% and the risk of death or recurrent MI will reduce by 32% (Shah *et al.*, 2010). Asthmatic patient who stop smoking will have significant improvement in quality of life, improvement of daytime symptoms and reduce need of rescue inhalers (Chaudhuri *et al.*, 2006; Jang *et al.*, 2010). Smoking cessation will also slow down disease progression of COPD.

Patient who was diagnosed of lung cancer may also have benefit once stop smoking. It reduces total mortality rate of 66% and reduce 46% of recurrence or second lung primary in patient who newly diagnosed Non-Small Cell Lung Carcinoma. For patient with establish Small Cell Lung Carcinoma, smoking cessation reduce total mortality rate by 46% and the risk of recurrence or second lung primary will reduce to 77% (Parsons *et al.*, 2010). For patient undergo surgical procedure, there are many evidence that smoking cessation before surgery will reduces the risk of post-operative complications, reduces the lung, heart and wound-related complications, decreases wound healing time, reduces bone fusion time after fracture repair and reduces length of stay in hospital (Nakagawa *et al.*, 2001; Sorensen, Karlsmark and Gottrup, 2003; Moore *et al.*, 2005). The evidence for optimize smoking cessation before surgery varies, most research finds 2-month smoking cessation prior to surgery provide the most benefit (Warner *et al.*, 1989; Barrera *et al.*, 2005; Myers *et al.*, 2011). Quitting smoking after surgery also brings significant benefits. A 20-year follow-up study of smokers who underwent coronary artery bypass graft surgery found that smoking cessation after surgery was an important independent predictor of a lower risk of death and repeat coronary procedures compared with patients who continued smoking (van Domburg *et al.*, 2000).

Despite of illness and being hospitalised, smoking cessation give a lot of benefit to patient as a secondary prevention, improve quality of life and post-surgical outcome. All of this benefit has been told inside the module as part of patient educations and increase motivation for patient to stop smoking.

2.2 Brief counseling intervention.

According to National Institute for health and clinical excellence (NICE) 2006, brief intervention is an opportunistic advice, discussion, negotiation or encouragement, delivered by range of primary and community care professionals (NICE guidelines, 2006). It usually done between five to ten minutes, involving simple opportunistic advice, assessment of the patient's commitment to quit, an offer to pharmacotherapy or behavior support and provision of self-help material and referral to more intensive support such as Quit smoking center. The aim of brief intervention is mainly to help smoker to move to a point where he or she is thinking about changing a lifestyle habit (stop smoking).

Brief intervention has been done and studied worldwide, not only in smoking problems, but also in other behavior problems such as alcohol abuse, drugs addiction and obesity management. Studies on brief intervention towards alcohol hazardous drinker shows positive results and was cost effective (Kunz, French and Bazargan-Hejazi, 2004; Mcqueen *et al.*, 2015). A study by Carina Ferreira-Borges in pregnant patient also shows a good result where tobacco abstinence was reported by 33.3% in the brief intervention group compared to 8.3% in the usual care group (Ferreira-borges, 2005).

There are a few guidelines available in producing a successful brief intervention module. Classically, 5A steps of intervention was introduced by Fiore et al since the year 2000 and are still being used until today to create brief intervention module. Fiore suggest using 5A steps intervention to patient who are willing to quit smoking (Fiore *et al.*, 2000). 5A stands for ask about tobacco use, advice to quit, assess the willingness to make a quit attempt, assist in quit attempt and arrange follow up. However, in patient in precontemplation phase, they

suggest using 5R strategy to enhance motivation towards smoking cessation. 5R stands for advice regarding relevance of quit smoking, risk of continue smoking, rewards or benefit in stop smoking, roadblock or barriers to stop smoking and repetition of advice. Many guidelines and module in brief intervention still use and modify this strategy.

NICE 2006 guidelines in brief intervention and referral for smoking cessation suggest modifying the intervention to 3A method which is advice stop smoking, ask patient who interested to quit and adhere for patient follow up and monitoring. Counseling is best given by health professionals especially doctors, nurses and smoking cessation trained counselor.

Most of guidelines and module emphasize the same important content to be put in brief intervention module, the first one is the smoking related illness for patient to think about the harm of smoking cigarettes. The harmful content of cigarettes is also important to be put into the module as patient can relate the chemicals in the cigarettes tat potentially cause cancer or carcinogenic. The benefit of stop smoking is important indicator to motivate patient to stop smoking and barriers in achieving total abstinence (physical and psychological dependence) are both important to be put in the brief intervention modules (Fiore *et al.,* 2000; NICE guidelines, 2006; Trafford Council and NHS foundation Trust, 2016).

By studying how brief intervention was done and what are the content of their module, it gives us idea to formulate and modify our own module. As the module for brief counselling intervention for hospitalised patient is still not available in Malaysia, hopefully our study will help to become a stepping stone for further research and future guidelines.

2.3 Motivation to quit and Model of change

Motivation is an important precursor for smokers to think about smoking cessation and determining the successful of smoking cessation attempt. KD McCaul et al had done a study to review what motivates smokers to quit. The results show that the main motivation to quit smoking among smokers is health concern and social concern (Mccaul *et al.*, 2006). Most of the smokers who attempt and successfully stop smoking are concern about their current and future health due to the smoking habit. Some health-related reason that motivates smokers to quit is the experience of silence symptoms and illness or death of family members due to smoking. Type of the disease also play an important role for patient to consider smoking cessation, a higher smoking cessation rate was reported by smokers who had smoking related diseases especially cardiovascular disease. Without any intervention, one third of smokers stop smoking after they were diagnosed with myocardial infarct (Perkins, 1988) and half of smokers quit after coronary bypass surgery (Rigotti, McKool and Shiffman, 1994). Social concern also makes a broad category to motivates smokers such as family pressure, social pressure, effect to others, responsibility to others and pregnancy (Mccaul *et al.*, 2006).

Model of stages of behavior change was created by Prochaska and DiClemente (figure 2.1). It provides a useful framework for understanding how people change their behavior and considering how ready they are to change their smoking behavior (Prochaska, DiClemente and Norcross, 1992). there are 5 sages of change, (precontemplation, contemplation, preparation, action and maintenance) and each stage need different approach in of intervention. Our study mainly focused on patient in precontemplation phase where they are a ‘happy-users’ of tobacco product, do not have worries about their use of cigarettes and did

not want to stop smoking. Patient in this stage may likely not to respond to advice to change their behavior but may be more open to receive information about risks associated with their pattern of smoking behavior (Henry-Edwards *et al.*, 2003). Providing information may encourage them to recognize the risks of smoking and to think about cutting down or stopping their smoking behavior.

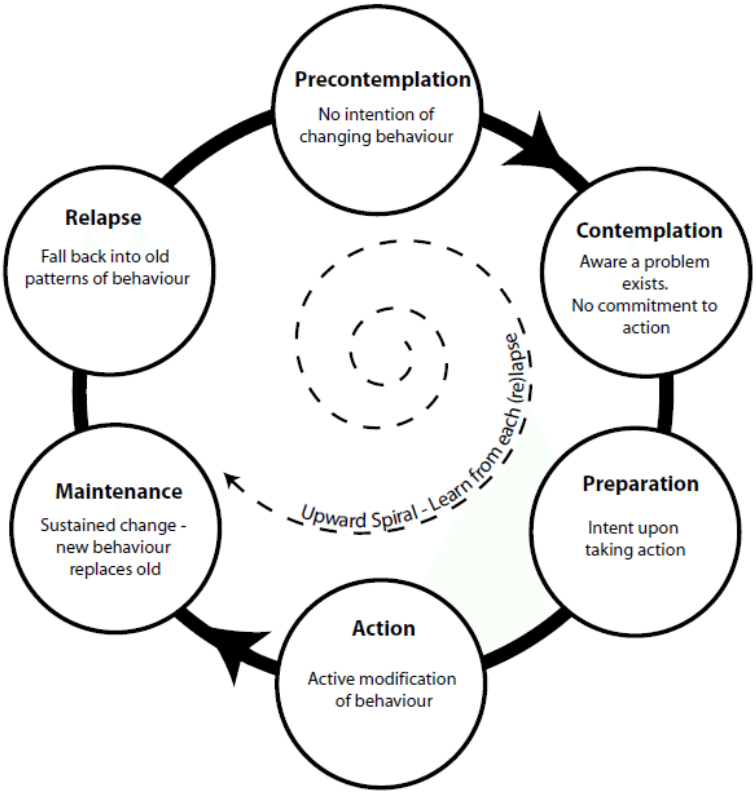

Figure 2.1: Model of stage of change Prochasca, DiClemente, Norcross (1992).

2.4.1 Factors causes Nicotine dependence

Most of adult smokers know the effect of smoking to their health, 92.2% of adult belief that smoking can cause serious illness. Despite of the knowledge, there are only 14.3% of current

smoker planned or thinking to stop smoking (Ministry of health, 2011). This is mainly due to the addiction effect of nicotine that causes smokers unable to stop their habit. Nicotine is a potent Parasympathomimetic alkaloid and stimulant drug found inside cigarettes. It derives from tobacco leaf (Nicotiana Tobacum). Nicotine act as nicotinic acetylcholine receptor (nAChR) agonist and play a major rule in giving the pleasure and addiction effect to the smoker (Benowitz, 2009; Mishra *et al.*, 2015). Depends on the product, each cigarette contains about 13.7-23.2 milligrams of nicotine (Djordjevic and Doran, 2009). Once inhale, nicotine enters blood stream through the lungs and carries quickly to different parts of body. It reaches the brain within seven seconds and readily crosses the blood-brain barrier. Nicotine binds to nAChR causes the release of dopamine; therefore, psychological rewards occur quickly. Users report the feeling of relaxation, calmness and alertness. Burst of nicotine in the brains stimulate adrenal glands to discharge epinephrine causing the increase of blood pressure. There is also sudden released of glucose and increased in respiration, heart rate, blood pressure, constriction of arteries and increased alertness (Perkins, 1988; Mishra *et al.*, 2015). As a stimulant drug, Nicotine can cause addiction, dependence and withdrawal symptoms. Nicotine activates the mesolimbic pathway and induces long term ΔFosB expression in the nucleus accumbens when inhaled or injected. Repeated daily exposure to nicotine can result in accumbal ΔFosB overexpression causing addiction (Nestler, 2013). Difficulty in concentrating and reduce task performance are the known effect of nicotine withdrawal, it can occur as soon as 30 minutes after smoking cessation and can last for several weeks (Heishman, Kleykamp and Singleton, 2010). All of this effect makes smokers feel difficult to initiate and maintaining smoking cessation.

There are few factors that could make someone prone to become nicotine dependence. Age and early smoking initiation among young adults can give rise to nicotine dependence. Younger age group are associated with higher chance of nicotine dependence compare with older age group. Young adult (age 21-30) are highly associated with nicotine dependence (Breslau, Kilbey and Andreski, 1994; Chen, Denise B. Kandel and Chen, 2000; Schmitz, Kruse and Kugler, 2003). Age during smoking initiation was also a predictor for nicotine dependence. People who smoke first cigarettes at 14-16 years old are 1.6 times likely to become nicotine dependence (Breslau, Fenn and Peterson, 1993).

Stressful job environment and low quality of life could cause nicotine dependence. A study among nurses who smoke shows significant relationship between psychological job demand and level of nicotine dependence (Ota *et al.*, 2004). Stressful life makes smokers take more cigarettes as nicotine could give temporary psychological reward. This can give rise to nicotine addiction. Psychiatric illness is well known one of the factors that could cause nicotine dependence. People with anxiety or depression are prone to smoke and become addicted to nicotine (Breslau, Kilbey and Andreski, 1994; Schmitz, Kruse and Kugler, 2003).

By knowing the factors of nicotine dependence, we can predict which patient are high risk to become addicted to nicotine and specific and intensive intervention (including by giving nicotine replacement therapy) can be done.

2.5 Conceptual Framework

The sociodemographic factors such as age, income, and job are associated to patient's nicotine dependence. Smoking related illness are influence by nicotine dependence and vice versa. Nicotine dependence and motivation will affect the patient's readiness to change their smoking habit and brief counseling will enhance the motivation for smokers to change their habit.

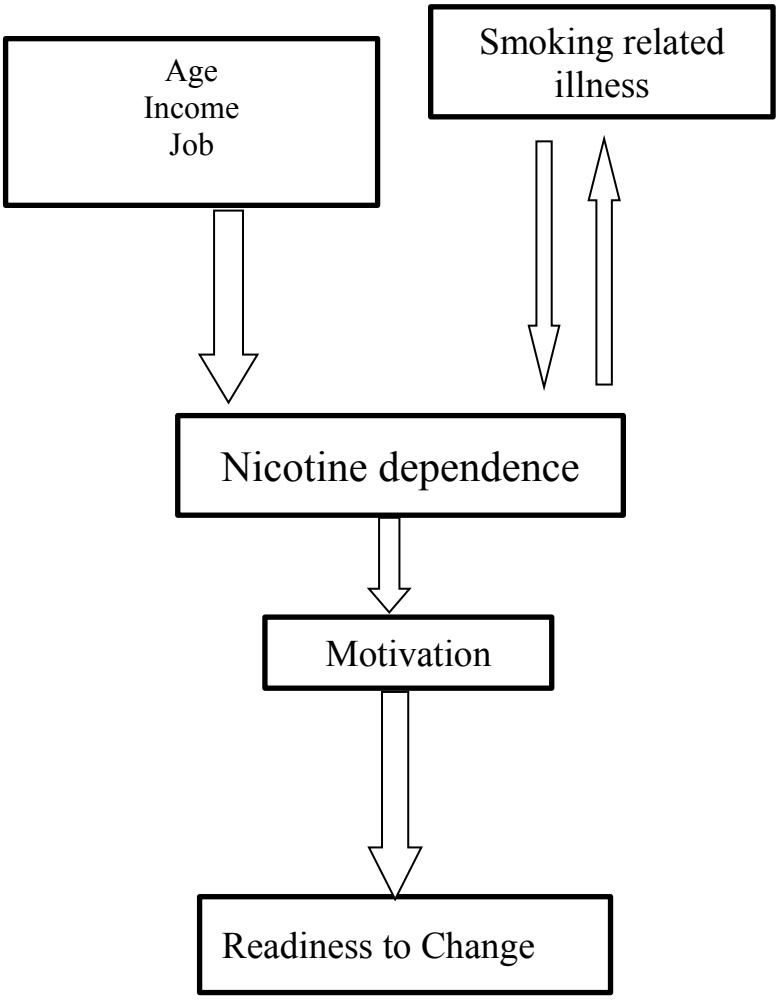

Figure 2. 2: Conceptual Framework

CHAPTER 3: OBJECTIVES & HYPOTHESIS

3.1 Research Question

The study will investigate the following research questions:

1. What are the associated factors for nicotine dependence?
2. What is the association between smoking related illness and nicotine dependence?
3. Does brief counseling module change patient's readiness towards smoking cessation compared to usual care?

3.2 General Objective

- To identify associated factors for nicotine dependence, determine association of nicotine dependence and smoking related illness and to evaluate the effectiveness of brief pre- discharge Smoking Cessation counseling module for hospitalised patient.

3.3. Specific objectives

1. To identify the associated factors for nicotine dependence.
2. To determine association between cause nicotine dependence and smoking related illness.
3. To determine the effectiveness of brief counseling module between intervention and control group, compared to usual care towards readiness of smoking cessation.

3.4 Research Hypothesis

1. Sociodemographic (age, job, income) and smoking related illness are associated with nicotine dependence.

2. There is significant association between smoking related illness and nicotine dependence.

3. Brief smoking cessation module is effective compared to usual care to change patient's readiness towards smoking cessation.

3.5 Operational definition

Smoking related illness: The diagnosis made on admission due to illness such as coronary heart disease, chronic obstructive airway disease and stroke which is caused by smoking.

Nicotine dependence: Maladaptive pattern of nicotine use leading to clinically significant impairment or distress manifested by tolerance, withdrawal, taken larger amount or longer period than intended, unable to cut down the nicotine consumption, great time spent on nicotine, and usage of nicotine despite the knowledge of its harm (Who, 2000). The level of dependence assessed using Fagerstrom score for nicotine dependence.

Readiness to change: The change from precontemplation to either one of the Proscha's transtheoretical model of change ie: contemplation, preparation and action phase after one month of intervention.

CHAPTER 4: METHODOLOGY

This study consists of two phases. Phase one which to study objective one and two were done in cross sectional study design whereas in phase two, to study objective three, randomize control trial design was done.

4.1 Phase one Study

4.1.1 Study area and background

Phase one is a cross sectional study and was done at medical and surgical ward, Universiti Sains Malaysia Hospital. It is a tertiary referral hospital which contain male and female ward. Patient from ward 7 Selatan, 7 Utara, 2 Intan, 3 Utara and 1 Selatan were interviewed and recruited in this study.

4.1.2 Reference population

The reference population for this study is current smokers in Kota Bahru, Kelantan.

4.1.3 Source population

The source population is current smokers admitted to medical and surgical ward, Universiti Sains Malaysia Hospital.

4.1.4 Sampling frame and study population

Current smokers admitted to Medical and surgical ward Uneversiti Sains Malaysia Hospital, Kubang Kerian, kelantan from 15th of August 2016 to 30th of October 2016 who fulfill the inclusion and exclusion criteria.

4.1.5 Inclusion criteria

I. Adults aged at 18 years old and above.

II. current smoker (smoke at least 1 day prior to admission).

III. precontemplation phase of PROSHASCKA's Transtheoretical model of change.

4.1.6 Exclusion criteria

I. Any psychiatric illness.

II. Concomitant alcoholic and drugs users.

III. Patient who is not stable, on inotropes or unable to speak.

4.1.7 Sample size determination

Sampling size determination for phase one study covering first and second objectives.

For the First objective, to calculate the sample size for associated factors for nicotine dependence, Power and Samples software comparing two means was used.

α = Level of significant = 0.05

B = power of the study = 80%

δ = Deference mean for age in control and intervention group (Tashkin *et al.*, 2001)

= 1.3

σ = Standard deviation of mean Fagerstrom score (Tashkin *et al.*, 2001)

= 1.7

m = Ratio of control group: intervention group = 1

Sample size = 28 patients per group

After considering of non-response rate of 20%, the sample size for this objective is 33 subjects per group.

The second objective was calculated using comparing two means by Power and Sample software:

α = Level of significant = 0.05

B = power of the study = 80%

δ = Deference mean for fagerstrom score in smoking related illness and nonsmoking related illness (Jiménez-Ruiz *et al.*, 2001)

= 1.62

σ = Standard deviation of mean Fagerstrom score (Jiménez-Ruiz *et al.*, 2001)

= 2.45

m = Ratio of control group: intervention group = 1

Sample size = 35 patients per group

After considering of non-response rate of 20%, the sample size for this objective is 42 subjects per group.

The largest sample size was 42 subjects per group from the second objectives.

4.1.8 Sampling method

Convenient sampling method used in this phase of study. It is due to limited time and forcibility. All patient that admitted to Medical and surgical ward HUSM during the period of the study will be asked randomly regarding their smoking status. If they are chronic smoker, still smoke one day prior to admission and fulfill the inclusion and exclusion criteria, they will be included in the study until the sample size is fulfilled.

4.1.9 Research tools

Research tools that had been used in phase one study ware medical record, Stage of change assessment form and Malay version of Fagerstrom test form.

Medical record:

Medical record of the patients had been used to get the sociodemographic data of the patients such as age, gender, occupations and income of the patient. Some of the information was

retrieve from direct interview to the patient. Refer appendix 6 for sociodemographic data form.

Malay Version Stage of change assessment form:

The stage of change assessment interview form has been designed according to part of five major steps (5A's) intervention in primary care settings for patient to stop smoking and it has been designed in Malay language. The 5A's intervention has being recommended to be used as a stop smoking guidelines in Malaysia's CPG 2003 (Division Disease Control, 2003). We are using Ask, Assess and Advice steps in this assessment form. In this phase, precontemplation smokers were determine using this form. The main question in the form is 'are you a smoker?' and if the answer is yes, 'do you plan to stop smoking?' and 'when do you plan to stop smoking? Those question was asked and recorded by the researcher. The stage of change is according to Proscha transtheoretical model of change. (refer appendix 1 for the stage of change assessment form).

Malay version of Fagerstrom test form:

Malay version of Fagerstrom test had been used to assess for nicotine dependence for all of the subject. It consists of six questions with score from 0 to 10. The question was asked by the researcher and total score was calculated for each patient. The Malay Version of Fagerstrom test has being validated by *Anne Yee et al.* from Department of Psychological Medicine, University of Malaya in the year of 2011 (H.A, Cg and Ar, 2011). The original version was used with permission from the original author. (Refer appendix 2 for the Malay version of Fagerstrom test form)

4.1.10 Data collection

Adult patients admitted to medical and surgical ward Universiti Sains Malaysia hospital from 15th August 2016 until 30th October 2016 were asked for smoking history. Convenient sampling method was done, patient who are smoking cigarettes at least one day prior to admission was asked to join the study. House officer in each medical and surgical ward was given briefing regarding the study, they informed the researcher any patient who was eligible for the study and patient who want to participate in the study was taken their consent by the researcher. Each patient was interviewed by researcher regarding their smoking history and sociodemographic data. The medical record of each participant was checked by the researcher to obtain the sociodemographic data and the full diagnosis of the patient. The level of nicotine dependent for each patient was determined by using Malay version of Fagerstrom test form, patient need to fill the form by themselves. The researcher informed the patient regarding their nicotine dependence level.

4.1.11 Statistical analysis

Data entry and analysis was done using SPSS (Statistical Package for the Social Sciences) statistic version 22.0. Data was entered, reviewed for data error, explored and cleaned.

Descriptive analysis was performed to determine the proportion of the patient assigned in intervention compare to control group. All categorical variables were described in frequency and percentage. Numerical variables were described in mean (SD). Variables with small number were collapsed to form meaningful combination variable.

For objective one, to identify the association factor for nicotine dependence, Simple and