Abstract of thesis entitled

“Intensive Smoking Cessation Intervention to Promote Smoking Cessation among Hospitalized Patients who Smoke”

Submitted by

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The hospital is an ideal place for implementing smoking cessation interventions, as hospitalized patients may have greater awareness of the health consequences of smoking. However, smoking cessation interventions in Hong Kong’s hospitals are still limited and not well established.

Smoking is the leading cause of the preventable deaths worldwide. Every smoker has the potential to benefit from an intervention for smoking cessation. As hospital admissions provide a great opportunity to reach those who have a desire to quit smoking because of health concerns, an effective smoking cessation program should be established in the hospital setting.

To draw nurses’ attention to smoking cessation interventions and to standardize their nursing practice when providing these interventions, an evidence-based protocol should be developed. After reviewing and critiquing eight research studies, in-hospital smoking cessation intervention protocols were developed based on the best available research evidence of the most effective interventions.
Intensive Smoking Cessation Intervention to Promote Smoking Cessation among Hospitalized Patients who Smoke

by

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Declaration

I declare that the thesis and the research work thereof represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

Signed …………………………………………

Chiu Ching Chi Carman
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Chapter 1: Statement of the Problem

Background of the problem

Hospitalization is a valuable opportunity for nurses to provide effective smoking cessation interventions for patients at risk of smoking complications. Hospitalized patients are not allowed to smoke, at least temporarily, according to the Smoking (Public Health) Ordinance in Hong Kong (Tobacco Control Office, 2012). Also, hospitalized patients are more likely to quit because of awareness of the health consequences of smoking as a result of acute hospitalization (McBride, Emmons, & Lipkus, 2003; Twardella, Loew, Rothenbacher, Stegmaier, Zigler, & Brenner, 2006).

In Hong Kong, there are many effective interventions available to the public to help smokers quit smoking cessation, such as nicotine replacement therapy (NRT) and behavioral therapy (Hospital Authority, 2014). Although the hospital is an ideal setting for implementing smoking cessation interventions, these interventions are still limited and not well established.

An intensive smoking cessation intervention focuses on individual counseling to increase smokers’ motivation to quit. Intensive smoking cessation intervention in hospitals includes individual counseling during the hospital stay and follow-up calls or visits after discharge.

By reviewing and critiquing research findings, we can find out whether intensive smoking cessation intervention is the most effective intervention for hospitalized smokers to quit smoking based on the best available research evidence.

Affirming the Need
In the public hospital where I work in Hong Kong, many patients are admitted because of the tobacco-related diseases (TRDs), such as cardiovascular disease, stroke, diabetes and chronic respiratory disease. After admission, patients are asked about their medical histories, and smokers are given brief advice on smoking cessation. We warn patients with a high risk of smoking complications that smoking carries a high risk of death and advise them to quit as soon as possible. Some nurses give brief advice while others do not. Most of them doubt the effectiveness of brief advice in reducing the number of smokers. As the most effective smoking cessation intervention for hospitalized smokers has not yet been found, it is hard for the health care professionals to implement smoking cessation intervention for hospitalized smokers in their daily nursing practice.

Smokers are hospitalized more frequently than non-smokers because cigarette smoking is a high risk factor for common chronic diseases such as cardiovascular disease, stroke, cancer, chronic respiratory disease and diabetes mellitus (Centers for Disease Control and Prevention, 2008; World Health Organization, 2008). As tobacco kills one of every two smokers (Edwards, 2004; World Health Organization, 2008), patients should be advised to stop smoking to reduce their mortality and morbidity. In my ward setting, nurses only provide brief smoking cessation advice based on their initiative and discretion instead of providing a well-established smoking cessation program as a routine nursing practice. Therefore a valuable chance to promote smoking cessation in the hospital setting is missed. If this situation continues, the chance for patients to attempt smoking cessation will be limited, which will lead to continued high morbidity and mortality rates, and great consumption of health care services in Hong Kong.
Smoking is the leading cause of preventable deaths worldwide. The World Health Organization (2008) stated that tobacco use led to 5.4 million premature deaths in 2004 and one hundred million premature deaths over the whole course of the 20th century. Half of those who start smoking regularly in their teenage years will be killed by tobacco eventually if they keep on smoking continuously (Thun, Peto, Boreham, & Lopez, 2012; World Health Organization, 2008). In Hong Kong, the tobacco epidemic kills about 16 people per day (Lam, Ho, Hedley, Mak, & Peto, 2001). By quitting smoking, people can reduce their risk of morbidity and mortality from TRDs (Anthonisen, Skeans, Wise, Manfreda, Kanner, & Connett, 2005; Critchley & Capewell, 2003; Doll, Peto, Boreham, & Sutherland, 2005).

Smokers can benefit from smoking cessation even after the development of TRDs. For smokers with artery or heart disease, the risk of heart attack can drop sharply one year after quitting and the risk of a stroke can fall to that of nonsmokers two to five years after quitting (U. S. Department of Health and Human Services, 2010). Smokers with diabetes can better control their blood sugar level if they quit smoking, which lowers the risk of serious complications such as retinopathy, peripheral neuropathy, and heart and kidney disease (U. S. Department of Health and Human Services, 2010). Smokers with chronic respiratory disease, can breathe easier with less coughing if they quit smoking (U.S. Department of Health and Human Services, 2010). Even after a diagnosis of lung cancer, quitting smoking can improve the treatment efficacy and survival rate, and decrease the cancer relapse rate, therefore improving overall quality of life. (Andreas, Rittmeyer, Hinterthaner, & Huber, 2013; Garces, Yang, Parkinson, Zhao, Wampfler, Ebbert, & Sloan, 2004; Parsons, Daley, Begh, & Aveyard, 2010).
Nicotine is an addictive substance (Benowitz, 2009; Le Foll & Goldberg, 2009). It elicits a reward effect and pleasure within the brain (De Biasi & Dani, 2011; Le Foll & Goldberg, 2009). This pleasurable feeling reinforces smoking behavior so smokers smoke even more. After chronic exposure to nicotine, withdrawal of the drug may elicit an abstinence syndrome that makes smokers continue to take nicotine in order to avoid withdrawal symptoms (Paolini & De Biasi, 2011). Therefore attempting to quit smoking is challenging. Specialized treatments and interventions should be provided to help patients who smoke quit smoking successfully.

The hospital is a smoke-free environment which provides an ideal environment to attempt smoking cessation. Hospital admission also provides a great opportunity to reach those who want to quit smoking because of health concerns. For these reasons, providing specialized smoking cessation intervention in the hospital is a potential innovation as an effective smoking cessation service in Hong Kong.

Objectives

My objectives are to find the most effective smoking cessation intervention based on a review and critique of research findings that I have found, assess the feasibility of the intervention, make conclusions and write a protocol for an intervention based on the best available research evidence. Nursing practice can be improved by transferring these findings to daily nursing practice.

Research question

My clinical question is “What is the effectiveness of intensive smoking cessation intervention in promoting smoking cessation in hospitalized patients?”

PICO Components
The target subjects are patients who are smokers admitted to the hospital. The innovation is the intensive smoking cessation intervention including individual counseling during the hospital stay and follow-up calls or visits after discharge. The control group is a group of patients with usual care or minimal intervention with limited self-help materials or minimal advice provided about smoking cessation. The outcomes are the long-term quit rates of patients at different periods of time after discharge.

**Significance**

As most patients who smoke are at high risk of smoking complications, a significant number can benefit if they quit smoking. Even a short period of abstinence from smoking can yield benefits, as can be seen in the first twenty-four hours after smoking cessation. The heart rate and blood pressure can drop back to normal twenty minutes after quitting (Mahmud & Feely, 2003). The carbon monoxide level in the blood can drop to normal twelve hours after quitting (Centers for Disease Control and Prevention, 2004). Two weeks after quitting, platelet aggregability and intracellular oxidative stress can be greatly improved (Morita, Ikeda, Haramaki, Eguchi, & Imaizumi, 2005). The risk of heart attack can be reduced to half one year after quitting, and the risk of lung cancer can be reduced ten years after quitting (Edwards, 2004; U. S. Department of Health and Human Services, 2010).

As cigarette smoking is a high risk factor for common chronic diseases, helping patients quit smoking can lead to great reductions in morbidity and mortality. By reducing the number of smokers, the health costs of tobacco use can be greatly reduced, therefore relieving the burden of smoking for Hong Kong hospitals.
Chapter 2: Review of Evidence

Selecting studies for review

The electronic databases used were Cochrane Library, PubMed, CINAHL Plus and Google Scholar. The keywords used for searching articles included smoking cessation, hospital* and patient.

Inclusion criteria

Types of studies. All types of clinical trials, especially randomized controlled trials (RCTs) were included.

Participants. All patients who were smokers and hospitalized during the period of study were included.

Interventions. Individual counseling and postdischarge follow-up with or without pharmacotherapy support were included. Individual counseling included any counseling increasing patients’ motivation to quit with or without using a transtheoretical model or motivational interviewing. It could include different lengths of time and frequencies. It could be delivered by nurses or trained smoking cessation counselors. The postdischarge follow-up could be done via telephone or outpatient visits. The total number of follow-ups and the length of the postdischarge follow-up period could vary.

Outcome measures. The outcome measures could be the point prevalent abstinence or continuous smoking abstinence by self-report of the patients or confirmation at different lengths of time after discharge. Confirmation could be done by providing proxy information, saliva sampling, urine sampling or measuring the level of expiratory carbon monoxide. Those participants lost to follow-up were counted as smokers.
Exclusion criteria. Patients who were admitted because of psychiatric disorders were excluded.

Search strategies

Databases and keywords. The search was conducted from March 2014 to September 2014. The search covered the period 2003 to September 1, 2014. The search for studies was done through Cochrane Library, PubMed, CINAHL Plus and Google Scholar. All searches covered smoking cessation. The search strategy for the four databases was smoking cessation in all text AND hospital* in all text AND patient in all text.

Flow diagram of included and excluded studies. The process of identification with limitation to “clinical trial” and “10 years”, screening of titles and abstracts, and assessment of full papers for eligibility, yielded eight studies in total. The detailed search strategy is presented using the PRISMA 2009 flow diagram in Figure 1 (Moher, Liberati, Tetzlaff, & Altman, 2009).

Methods of review

Data extraction. I had found seven RCTs and one non-randomized controlled study. For all these quantitative studies, I extracted data on study type, patient characteristics, intervention, comparison, length of follow-up, outcome measures and effect size. A table of evidence should be used as a data extraction tool to provide a good, simple, quick summary of the relevant studies and provide relevant information for synthesis of the results (Scottish Intercollegiate Guidelines Network, Harbour, & Forsyth, 2011). There is no standard format which is good for all situations. The format of the table of evidence depends on the study design and the information which is considered important for the clinical question.
Quality assessment. A reliable and valid appraisal tool should be used for verification of the methodological quality. There are many tools for assessing the quality of studies according to the design of the study. The Scottish Intercollegiate Guidelines Network (SIGN) was used in appraising the eight research studies that I had found. RCT checklists were used for the seven RCTs. The RCT checklist was also used for the non-randomized controlled study, but questions 2, 3 and 4 were omitted and the overall quality of this study could not be higher than 1+ (Healthcare Improvement Scotland, 2001).

Data analysis. For each study, the main difference between the intervention and control groups was that subjects in the intervention group had individual counseling and follow-up calls or visits after discharge. The effectiveness of the intensive smoking cessation intervention was reviewed by comparing smoking cessation rates between intervention groups and minimal intervention groups or usual care groups. A limitation of the review was that outcome measures were not done at the same intervals in each study, so not all smoking abstinence rates at different intervals after discharge could be used for comparison.

Description of studies

Results of the review. According to the table of evidence (Table 1), there were seven RCTs and one non-randomized controlled study. They were conducted in Canada (Chouinard & Robichaud-Ekstrand, 2005; Smith & Burgess, 2009; Smith, Corso, Brown, & Cameron, 2011), San Francisco (Simon, Carmody, Hudes, Snyder, & Murray, 2003), Brazil (de Azevedo et al., 2010), Spain (Ortega et al., 2011), United Kingdom (Murray, Leonardi-Bee, Marsh, Jayes, Li, Parrott, & Britton, 2013) and Norway (Quist-Paulsen & Gallefoss, 2003) between 2003
Three studies targeted cardiac patients (Chouinard & Robichaud-Ekstrand, 2005; Quist-Paulsen & Gallefoss, 2003; Smith & Burgess, 2009), two targeted medical and surgical patients (Simon et al., 2003; Ortega et al., 2011), one targeted medical patients (Murray et al., 2013) and two targeted all patients (de Azevedo et al., 2010; Smith et al., 2011). The mean ages of patients in seven studies ranged from 47.6 to 57 years (Chouinard & Robichaud-Ekstrand, 2005; de Azevedo et al., 2010; Murray et al., 2013; Simon et al., 2003; Smith & Burgess, 2009; Smith et al., 2011; Quist-Paulsen & Gallefoss, 2003). The mean age in the other study ranged from 61.1 to 65.8 years (Ortega et al., 2011). The mean hospital stay ranged from 5 days to 9 days in six studies (Chouinard & Robichaud-Ekstrand, 2005; Murray et al., 2013; Simon et al., 2003; Smith & Burgess, 2009; Smith et al., 2011; Quist-Paulsen & Gallefoss, 2003). Two studies did not report the mean hospital stay of the target group (de Azevedo et al., 2010; Ortega et al., 2011). Three studies did not mention the mean number of cigarettes smoked per day (Chouinard & Robichaud-Ekstrand, 2005; Murray et al., 2013; Ortega et al., 2011). The mean number of cigarettes smoked per day in the other five studies ranged from 14.3 to 24 (de Azevedo et al., 2010; Simon et al., 2003; Smith & Burgess, 2009; Smith et al., 2011; Quist-Paulsen & Gallefoss, 2003).

All studies compared the effect of the intensive smoking cessation intervention against a minimal smoking cessation intervention or usual care in the target groups.

Three of the seven RCTs had NRT support in both the intervention and control groups (Murray et al., 2013; Simon et al., 2003; Smith & Burgess, 2009).
two had NRT support or advice in the intervention groups only (Chouinard & Robichaud-Ekstrand, 2005; Quist-Paulsen & Gallefoss, 2003), and two did not have NRT support in either the intervention or control groups (de Azevedo et al., 2010; Smith et al., 2011). The non-randomized controlled study (Ortega et al., 2011) contained two intervention groups, one with cognitive intervention with NRT support, and the other with cognitive intervention without NRT support. The control group had minimal intervention without NRT support.

The degree of intensive intervention varied slightly among studies. They contained counseling on smoking cessation with different numbers of follow-up calls or visits over different lengths of time after discharge. Postdischarge intervention ranged from at least one follow-up call after discharge (Murray et al., 2013) to seven follow-up calls or visits over two to twelve months after discharge (de Azevedo et al., 2010; Smith & Burgess, 2009; Smith et al., 2011; Ortega et al., 2011). In addition, one study provided outpatient consultation for the intervention group at six weeks after discharge (Quist-Paulsen & Gallefoss, 2003).

Although all control groups in all studies had minimal intervention, the degree of minimal intervention varied slightly among studies. The minimal interventions included general smoking cessation advice, or five to fifteen minute counseling sessions with or without distribution of self-help materials and/ or NRT support, and /or having a note in the medical records to remind health care providers to give smoking cessation advice to patients when they encountered them. One study arranged group visit counseling twice a week for its minimal intervention group (Quist-Paulsen & Gallefoss, 2003).

For the outcome measures, smoking abstinence was measured at four
weeks, two months, six months or twelve months after discharge according to the length of follow-up in different studies. Some results were self-reported (de Azevedo et al., 2010; Quist-Paulsen & Gallefoss, 2003; Simon et al., 2003; Smith & Burgess, 2009; Smith et al., 2011; Ortega et al., 2011); some were verified by biochemical methods (Chouinard & Robichaud-Ekstrand, 2005; Murray et al., 2013; Quist-Paulsen & Gallefoss, 2003; Simon et al., 2003; Smith and Burgess, 2009; Smith et al., 2011; Ortega et al., 2011 ). In some studies, the decrease in the number of cigarettes smoked per day (de Azevedo et al., 2010) and progress through stages of change (Chouinard & Robichaud-Ekstrand, 2005) were also compared between the intervention and control groups. The stages of change are based on the transtheoretical model-5 stages of change (precontemplation stage, contemplation stage, preparation stage, action stage, and maintenance stage).

**Effect of intervention vs. minimal intervention/ usual care.** In the eight studies, the main difference between groups was that subjects in the intervention group had individual counseling and follow-up calls or visits after discharge. All studies showed positive results in the difference in smoking cessation rates between the intervention and control groups.

**Quality assessment**

**Overview of methodological quality.** According to the table of internal validity (Table 2) and the table of overall quality assessment (Table 3), three RCTs (Quist-Paulsen & Gallefoss, 2003; Smith & Burgess, 2009; Smith et al., 2011) had high quality and four RCTs (Chouinard and Robichaud-Ekstrand, 2005; de Azevedo et al., 2010; Murray et al., 2013; Simon et al., 2003) had fair quality. Details of the ratings were discussed and analyzed according to each appraisal component in the SIGN checklist.
All seven RCTs had adequate randomization for the subject assignment. Five had adequate concealment (Chouinard & Robichaud-Ekstrand, 2005; de Azevedo et al., 2010; Quist-Paulsen & Gallefoss, 2003; Smith & Burgess, 2009; Smith et al., 2011) while one did not use a concealment method (Murray et al., 2013) and the other one did not clearly report the concealment method (Simon et al., 2003). Four RCTs had blinding in treatment allocation (de Azevedo et al., 2010; Quist-Paulsen & Gallefoss, 2003; Smith & Burgess, 2009; Smith et al., 2011) while two RCTs (Murray et al., 2013; Simon et al., 2003) did not, and one (Chouinard & Robichaud-Ekstrand, 2005) did not clearly report the blinding method.

In the study of Chouinard and Robichaud-Ekstrand (2005), a large number of patients in the usual care group discontinued participation, which led to a high dropout rate. This may have resulted in overestimation of the difference in the smoking cessation rate between the intervention and control groups. Together with lack of clear reporting about the blinding method, the overall quality of the study of Chouinard and Robichaud-Ekstrand (2005) was only fair.

Overestimation of the difference in smoking cessation rates between groups might also have occurred in the research of Murray et al. (2013), as the dropout rate in the control group was 37% while the dropout rate in the intervention group was 26%.

Although the Murray et al. (2013) study did not have an adequate concealment method and no blinding method was used during treatment allocation, it was believed that bias was unlikely. As all wards were randomized at the same time, patients were admitted to wards according to their specialty and sex, so selection bias related to the intervention was unlikely. The participants were aware
of the group assignment, but all of them were provided with the same information about the trial without offering information about the different interventions. Ward staff also did not know the details of the study. In addition, all outcome measures were verified by biochemical tests, and therefore reporting bias was eliminated. The quality of this study was rated fair only because of the difference between the intervention and control groups at the beginning of the trial and the high dropout rate which might have led to bias. The smoking cessation rate difference between groups at 4 weeks was +21% (p=0.06) and the result was not significant at the 5% level. This was strongly related to the intervention effect from oncology patients, as physicians declined to give investigators access to most of these patients during the trial. If oncology patients were excluded in calculating the results, the rate difference was +25% (p=0.006) which was significant. The smoking cessation rate at 6 months after discharge would not be included in the evaluation as it was not significant at the 5% level.

The treatment and control groups were not similar at the start of the trial of de Azevedo et al. (2010). The control group had more patients with TRDs, which was a factor in smoking cessation. Also, intention-to-treat analysis was not applied in the study. These two factors might have led to bias in the study and therefore the overall quality of the study was fair.

Since no blinding method was used in the study of Simon et al. (2003), assigning samples to intensive intervention might have increased the likelihood of quitting smoking in the intervention group. This might have led to overestimation of the smoking cessation rate in the intervention group. Also, the concealment method was not stated clearly in the research. Therefore the overall quality of the study was only fair.
Although the similarity between treatment and control groups could not be determined at the start of the trial of Quist-Paulsen & Gallefoss (2003), the overall quality rating of the study was still high as it fulfilled all other components in the table of internal validity (Table 2) and was effective in minimizing bias.

The overall quality of the studies of Smith & Burgess (2009) and Smith et al. (2011) was high, as they had strong methodological quality and were effective in minimizing bias.

Except for the randomization, concealment and blinding, the non-randomized controlled study (Ortega et al., 2011), fulfilled all the requirements of the SIGN checklist for RCTs. Therefore the level of quality was fair.

**Summary and synthesis**

In the research studies of cardiac patients (Chouinard & Robichaud-Ekstrand, 2005; Quist-Paulsen & Gallefoss, 2003; Smith & Burgess, 2009), the smoking cessation rates were relatively high in the intervention groups, ranging from 41.5% (Chouinard & Robichaud-Ekstrand, 2005) to 76% (Smith & Burgess, 2009) compared with rates in the intervention groups in the other research trials (de Azevedo et al., 2010; Murray et al., 2013; Simon et al., 2003; Smith et al., 2011; Ortega et al., 2011) which ranged from 27% (Ortega et al., 2011) to 48% (de Azevedo et al., 2010). The smoking cessation rates in the control groups in the cardiac research studies (Chouinard & Robichaud-Ekstrand, 2005; Quist-Paulsen & Gallefoss, 2003; Smith & Burgess, 2009) were also relatively high, ranging from 20% (Chouinard & Robichaud-Ekstrand, 2005) to 61% (Smith & Burgess, 2009), compared with the rates in the control groups in the other research trials (de Azevedo et al., 2010; Murray et al., 2013; Simon et al.,
2003; Smith et al., 2011; Ortega et al., 2011) which ranged from 7% (Ortega et al.,
2011) to 45% (de Azevedo et al., 2010). This might be because those cardiac
patients had cardiovascular diseases which were related to tobacco use, and
tobacco-related diseases have been shown to be a factor in increasing smoking
cessation rates after discharge (Buckland & Connolly, 2005; Hajek, Taylor, &
Mills, 2002).

All studies showed differences in smoking cessation rates between the
intervention and control groups. Although the study of Simon et al. (2003) had a
smoking cessation rate difference of +9%, p=0.07 between groups, I still included
the study in the analysis, as its result was consistent with the overall trend. In the
study of Chouinard and Robichaud-Ekstrand (2005), only the point prevalent
smoking abstinence rate at six months after discharge and the progress through
stages of change at two and six months after discharge were evaluated as they
were the only results with p<0.05.

The five to fifteen minute cessation advice, take-home materials and
notes in the patient chart reminding physicians to provide smoking cessation
messages led to higher smoking cessation rates in the control groups. This led to
smaller differences of less than +10% in the smoking cessation rates between
groups in the research studies of Simon et al. (2003), de Azevedo et al. (2010) and
Smith et al. (2011).

The control groups in the studies of Ortega et al. (2011) and Murray et
al. (2013), were only asked about smoking and given smoking cessation support at
the initiative of the clinical staff, so the differences in the smoking cessation rate
between groups were +20% or more.

Therefore the amount of the minimal intervention affects the smoking
cessation rate in control groups. More intervention leads to higher cessation rates. This assumption can be further confirmed by the research studies targeting cardiac studies’ patients who smoked. The degree of minimal intervention in the studies of Quist-Paulsen and Gallefoss (2003) and Smith and Burgess (2009) was relatively high. The smoking cessation rate differences between groups were around +13% to +19%. In the study of Chouinard and Robichaud-Ekstrand (2005), the control group received only usual care, and the rate difference between groups was more than +20%.

Although the frequency of the postdischarge follow-up calls or visits varied in different studies, the smoking abstinence rates in the intervention groups at twelve months after discharge were similar. Among the studies of cardiac patients, Quist-Paulsen and Gallefoss (2003) provided at least five follow-up calls over five months and Smith and Burgess (2009) provided seven follow-up calls over two months. The smoking abstinence rates of the intervention groups at twelve months after discharge in their studies were around 50% to 54%. Among the other studies, Simon et al. (2003) provided five follow-up calls over four months, Ortega et al. (2011) provided seven visits or follow-up calls over twelve months and Smith et al. (2011) provided seven follow-up calls over two months. The smoking abstinence rates in the intervention groups at twelve months after discharge in these studies were around 27% to 29%.

Although the continuous smoking abstinence rate differences between groups in the Chouinard and Robichaud-Ekstrand (2005) study were not significant at the 5% level at two and six months, the difference in progress through stages of change at two and six months was positive and significant. In the de Azevedo et al. (2010) study, the median number of cigarettes smoked daily
decrease more significantly in the intervention group compared with the control group. These two studies showed that even if subjects in the intervention groups did not quit smoking, they made progress towards quitting. Therefore, every smoker in the intervention groups had the potential to benefit from the intensive smoking cessation intervention.

Five of the eight studies (Chouinard & Robichaud-Ekstrand, 2005; de Azevedo et al., 2010; Simon et al., 2003; Smith & Burgess, 2009; Ortega et al., 2011) had counseling sessions of around thirty to sixty minutes. Except for the study of Quist-Paulsen and Gallefoss (2003), in which counseling was based on reviewing a booklet which emphasized the health benefits of smoking cessation and relapse prevention, all intensive counseling included cognitive and behavioral support. We can conclude that the most effective smoking cessation intervention for hospitalized patients who smoke is at least thirty minutes individual counseling with cognitive and behavioral support together with follow-up calls after discharge. No specific frequency of postdischarge follow-up calls was recommended as that was not a factor in the smoking cessation rate after discharge.

Only one RCT (Chouinard & Robichaud-Ekstrand, 2005) included NRT in the intervention group but not the control group, and the smoking cessation rate difference between groups was not significant compared with studies with or without NRT support in both groups. Therefore more research is needed to evaluate the relationship between the provision of NRT for patients who smoke and their smoking cessation rate after discharge.

The study of Ortega et al. (2011) provided visits or phone calls as follow-up for the intervention group, and the smoking abstinence difference
between groups at twelve months after discharge was relatively high. Since only one study provided follow-up visits, it could not be proved whether these visits led to higher smoking abstinence after discharge. More research is needed to evaluate if follow-up visits are needed as a component of an intensive smoking cessation intervention.

Smoking cessation services are not well established in hospitals in Hong Kong. In my hospital, this type of service is not available for patients who smoke. Nurses only assess smoking status at admission and give smoking cessation advice at their own initiative. According to the research above, if patients are given a smoking cessation intervention with individual counseling during hospitalization and follow-up calls after discharge, 20% more patients will quit smoking after discharge compared with those given usual care, whether they are cardiac patients or not. Therefore, patients in all wards who smoke should be included, except those admitted because of psychiatric disorders.
Chapter 3: Assessing the Implementation Potential

In the previous sections, we concluded that intensive smoking cessation intervention during hospitalization can lead to high smoking cessation rates after discharge. Before transferring these findings into evidence-based practice guidelines, we should assess the implementation potential in the target setting. In this section, we want to identify the transferability and feasibility of the findings, and the cost-benefit ratio of the innovation.

Target audience and setting

The target setting is the six general medical wards in an acute public hospital under the Hong Kong West Cluster of the Hospital Authority. The target audience is current smokers eighteen years old or older in the target setting. Patients admitted for terminal illnesses or psychiatric disorders should be excluded. Patients who are considered medically unstable by their physicians will also be excluded.

Transferability of the findings

Fit of intervention in proposed setting. All studies were done in well-developed countries, so social and economic differences between the studied countries and Hong Kong are unlikely. Hong Kong is an international city, and cultural differences in smoking between Hong Kong and the studied countries are also unlikely.

The target hospital was accredited by the International Society for Quality in Health Care last year (Hospital Accreditation, 2014). Therefore, the target setting meets international standards of practice and principles. The standards of care are similar to those in the studied hospitals in western countries.
Similarity of research population to target population. Among the eight studies, three studies targeted cardiac patients (Chouinard & Robichaud-Ekstrand, 2005; Quist-Paulsen & Gallefoss, 2003; Smith & Burgess, 2009), and the other five studies included medical patients as samples. Since the target setting has medical patients and general cardiac patients, the innovation could fit into the target setting.

The mean age of patients in the Ortega et al. (2011) study ranged from 61.1 to 65.8 years. The mean age ranged from 47.6 to 57 years in other seven studies. According to the Hospital Authority Statistical Report 2012-2013 (2014), most patients admitted to the Hospital Authority are 50 years old or older which is similar to the mean age range of the research population.

Two studies did not report the mean hospital stay of the samples (de Azevedo et al., 2010; Ortega et al., 2011). The mean hospital stay ranged from five days to nine days in the other six studies (Chouinard & Robichaud-Ekstrand, 2005; Murray et al., 2013; Quist-Paulsen & Gallefoss, 2003; Simon et al., 2003; Smith & Burgess, 2009; Smith et al., 2011). According to the Hospital Authority Statistical Report 2012-2013 (2014), the mean hospital stay of patients 15 to 44 years old admitted to the Hospital Authority was 9.2 days. The mean hospital stay was 11.8 days for those 45 to 64 years old, 12.9 days for those 65 to 74 years old, and 17.1 days for patients 75 years old or older. As long as the mean hospital stay of the proposed target patient is not less than five days, the innovation could fit into the target population.

Three studies did not report the mean number of cigarettes smoked by the research population (Chouinard & Robichaud-Ekstrand, 2005; Murray et al., 2013; Ortega et al., 2011). In the other five studies, this figure ranged from 14.3 to
24. According to the thematic Household Survey Report No. 53 (2013), daily smokers in Hong Kong smoked an average of 13 cigarettes per day, similar to the range mentioned in the five studies.

**Philosophy of care.** For the innovation, the counselling is customized based on each patient’s smoking habits and his/her concerns and difficulties in smoking cessation. Since smoking cessation interventions in the community are well-established, and it has been proved that implementing intensive smoking cessation interventions in hospitals is effective, we should introduce an effective smoking cessation intervention in hospitals.

The philosophy of care underlying this innovation is same as that of the target hospital, “to provide patient-centred high quality service to the community in an effective and efficient manner by optimum utilization of available resources”. (Queen Mary Hospital, 2008).

**Sufficient clients to benefit.** There are no statistics from the Hospital Authority on the number of patients who smoke who have been admitted to the target setting. We can generate an approximate number by counting the number of patients who smoke admitted to one male general medical ward and one female general medical ward in one week. During this period, a total of 140 patients were admitted to these two wards. Of these, 15 were smokers who were 18 years old or older which is 10.7% of the total number of patients admitted. Therefore, approximately 4320 patients in the target population would be admitted to the six target wards in a year.

If patients quit smoking, not only the patients benefit. The patients’ relatives are also not exposed to second hand smoke. Therefore, there is a sufficiently large number of clients who could benefit from the innovation.
Implementation and evaluation time. The innovation should start with two weeks of recruiting and training. Three nurses would be recruited in the first week and they would attend a three day course given by the University of Hong Kong. After the training, the nurses would be given a briefing on the innovation. The trained nurses would then do a pilot test in one general medical ward for four weeks. Comments from different parties would be evaluated during the pilot test. After that, the innovation would be implemented in the target setting for twelve months. Since the smoking status of the clients would be measured six months after discharge, an evaluation meeting would be held during the seventh month and then every month afterwards to check the effectiveness of the innovation. The time frame for preparation, pilot testing, implementation and evaluation are reasonable and well organized.

Feasibility

Freedom to implement. Nurses are trained to think critically and have a high degree of autonomy in nursing practice. They have authority to make their own decisions and freedom to act based on their professional knowledge. Therefore, nurses who are specially trained in the innovation would have the freedom to carry out the innovation or terminate it if they consider it undesirable.

Interference with current functions. Three nurses will be recruited from three different general medical wards for nineteen and a half months. The target hospital commonly recruits nurses from the general medical wards to work in isolation wards and overflow wards every year when there are a large number of admissions during outbreaks of infectious diseases or influenza. Although manpower in the general wards decreases, at most only one nurse is recruited
from one ward setting, and enough manpower is still available each working shift. Therefore there is no interference with current staff function.

The same situation applies when recruiting nursing staff for the innovation. One nurse will be recruited from one female general medical ward and one male general medical ward. As manpower is shared between these wards, manpower will decrease by only 0.5 in each of those six wards, much less than the situation during disease outbreaks. Therefore, the target medical wards can still maintain enough manpower and interference with current staff function is unlikely.

**Administration and organizational support.** Administrators and organization leaders may not understand the importance of implementing the innovation in the hospital. They may not know the cost-effectiveness of the innovation compared to that for referring the patients who smoke to smoking cessation organizations after discharge. Therefore they may be reluctant to use extra resources for the innovation. To implement the innovation, we need to communicate clearly with administrators and organization leaders about our evidence-based findings and address the cost-benefit of the innovation.

**Consensus and friction among staff.** Nurses and doctors usually provide minimal smoking cessation advice to patients who smoke and instead, refer them to smoking cessation organizations after discharge. But most clinical staff do not know that an intensive smoking cessation intervention during hospitalization is much more effective than usual care for patients who smoke.

Recruitment of staff will be difficult if we cannot get a consensus among them. We should cite supporting evidence to address the importance of the innovation in order to implement the innovation.
**Skills needed to implement intervention and staff development.** The essential component of the innovation is nurses skilled in intensive smoking cessation service. In my own practice environment, the nurses lack this professional training. To implement the innovation, we can collaborate with the University of Hong Kong (HKU) Smoking Cessation Counselling Training Centre to provide nurses with professional training on smoking cessation interventions. The training includes awareness of the health effects of smoking and quitting smoking, smoking statistics in Hong Kong, and smoking cessation treatments. Nurses will be trained to conduct cognitive-behavioural intervention and counselling using skills in motivational interviewing, a transtheoretical model and 5 “A” and 5 “R” interventions which are ask, advise, assess, assist, and arrange, and relevance, risks, rewards, roadblocks, and repetition. This type of intensive training can be completed within a few days at a cost of around $3900 for three nurses. Details of the cost are described below. Since the cost and time consumed are limited, the cost-benefit ratio of this intensive training is high.

**Facilities available to implement the intervention.** Smoking cessation counselling can be done at the bedside or in a room in the wards. Simple stationery such as pen and paper is available for documentation of a client’s progress. A telephone system should be set up to make follow-up calls after discharge of the clients.

**Evaluation tools available.** To evaluate the effectiveness of the innovation, we need to check the number of clients that have quit smoking six months after discharge. The smoking status is the self-reported seven-day point prevalence of no smoking. Self-report has proved to be a valid measure for tobacco abstinence (Barrueco et al., 2005). This method is more feasible than
asking clients to provide samples for biochemical confirmation. The same evaluation method was used in the studies of Smith and Burgess (2009), de Azevedo et al. (2010), Ortega et al. (2011) and Smith et al. (2011).

**Cost-benefit ratio of the innovation**

**Potential Risks.** The eight research studies indicated that there were no risks to clients during the interventions.

**Potential Benefits**

*Client benefits.* Under the intervention, our target group will not experience any risk, but will receive many potential benefits if they quit smoking. Cigarette smoking is one of the major modifiable risk factors for common chronic diseases. Smoking less or quitting smoking completely can prevent premature deaths or further deterioration of health status.

*Other benefits.* Patients with TRDs consume a large amount of health care resources. If more patients quit smoking, the health costs of tobacco use and the burden of smoking on the Hong Kong medical system can be greatly reduced.

**Risks of maintaining current practice.** Based on evidence-based findings from the eight research studies, if current practice is maintained, there will be 20% fewer people who quit smoking in the target population. Therefore morbidity and mortality will be higher in that 20% of the target population.

**Costs**

**Material costs.** Material costs can be divided into set-up costs and operational costs. A summary of the material costs is shown in Table 4.

*Set-up costs.* Three nurses will be recruited for nineteen and a half months in total for training, pilot testing, implementation and evaluation. Their hourly salary is $200. The total cost of time for three nurses is $1,872,000.
Several lecturers, pharmacists and professors will be invited to teach the training sessions. The mean hourly salary for the thirteen hours of teaching is around $300. The total charge for the training course is $3,900. As the cost of time for the training is included in the costs for the three nurses, it can be omitted in this part of the calculation.

*Operational costs.* The fee for each telephone is $48 per month. The total expenditure for the telephone system will be $2,808. Therefore the total cost of implementing the innovation is around $1,900,000.

*Nonmaterial costs.* Since enough manpower can be maintained in the target ward settings, ward nurses can carry out their daily ward routine and the innovation will not affect the quality of nursing care. Their workload will not be greatly affected. Therefore, lower staff morale, a high staff turnover rate or absenteeism will not occur. Also, counselling is done only during the patients’ free time, so medical treatments and investigations should not be affected.

*Costs of not implementing intervention.* Active smoking leads to premature deaths and increased medical care for patients with TRDs. If we do not implement the intervention, the total direct health care expenditure due to smoking will continue to be high. McGhee et al. (2006) calculated that direct health care costs due to active and passive smokers in Hong Kong public hospitals was $1,952,000,000. As passive smokers contribute 28% of the total cost, the direct health care cost of active smokers in public hospitals was $1,405,440,000.

As there are 17 public hospitals in Hong Kong, the direct health care costs of active smokers in the target setting is around $1,405,440,000 / 17 = $82,670,000 in a year.
If the intervention is not implemented, 20% more of the target population will fail to quit smoking. The total direct health care costs of those smokers in the target setting is approximately $82,670,000 \times 20\% = $16,500,000 in a year. As the innovation can save around $14,600,000 each year in the target setting, it is cost-effective.
Chapter 4: Evidence-Based Practice Guidelines

After proving the intervention is feasible, transferable and cost-effective, we can develop new evidence-based practice guidelines based on the eight research studies and assess the recommendations according to levels of evidence and grades of recommendation (Scottish Intercollegiate Guidelines Network, Harbour, & Forsyth, 2011).

Title of guidelines

Evidence-based practice guidelines for an intensive smoking cessation intervention for adult patients who smoke in general medical wards

Aims and objectives of the guidelines

- To formulate clinical instructions for an intensive smoking cessation intervention during hospitalization based on the best available research evidence

- To standardize the intensive smoking cessation intervention in the general medical wards

- To improve the care and health outcomes of the target population

Target group

The target population is current smokers eighteen years old or older admitted to the general medical wards.

Interventions and practices considered
The intervention includes individual counseling during hospitalization and postdischarge phone follow-ups on smoking cessation.

**Major outcomes considered**

Under the intervention, 20% more of the target population will quit smoking after discharge.

**Recommendations**

**Recommendation 1.** Smoking cessation intervention should be delivered individually (Grade B).

*Available evidence.* The smoking cessation rate was high in the intervention groups who had individual counseling, and low in the control groups who had group sessions (Quist-Paulsen & Gallefoss, 2003) [1++].

**Recommendation 2.** Intensive cognitive-behavioral intervention should be included in smoking cessation counseling (Grade A).

*Available evidence.* The smoking cessation rate was high in the intervention groups with cognitive-behavioral intervention compared with the control group (Chouinard & Robichaud-Ekstrand, 2005) [1+] (de Azevedo et al., 2010) [1+] (Murray et al., 2013) [1-] (Simon et al., 2003) [1+] (Smith & Burgess, 2009) [1++] (Smith et al., 2011) [1++] (Ortega et al., 2011) [2+].

**Recommendation 3.** Emphasis on the harmful effects of smoking is important in smoking cessation counseling (Grade A).

*Available evidence.* The smoking cessation rate was high in an intervention group in which counseling emphasized the mortality rate of smokers compared with the control group (Quist-Paulsen & Gallefoss, 2003) [1++].

The smoking cessation rate was also high in the intervention groups in which the dangers of smoking were reviewed in the counseling (de Azevedo et al.,...

**Recommendation 4.** A postdischarge phone follow-up intervention period of at least six months is important for effective results (Grade A).

**Available evidence.** A nurse-led smoking cessation intervention with at least a five-month follow-up increased the smoking cessation rates in the samples (Quist-Paulsen & Gallefoss, 2003) [1++].

One third of the clients in the intervention group had relapsed between two and six months after discharge, had tried to quit again, and were not smoking at six months (Chouinard & Robichaud-Ekstrand, 2005) [1+].

A high-intensity intervention group had a lower rate of seeking other smoking cessations treatments at six months than low-intensity and usual care groups. This implied the patients considered the intensive intervention with phone follow-ups sufficient to quit smoking and they did not need to search for other treatment at six months. (de Azevedo et al., 2010) [1+].
Chapter 5: Implementation plan

Review and summary of chapter 1 to 4

In chapter 1 and chapter 2, I stated the current nursing practise towards smoking cessation in my clinical setting and the importance of quitting smoking in the reduction of mortality and morbidity. If nursing practise in providing smoking cessation advice in a clinical setting does not improve, it will lead to high morbidity and mortality rates and great consumptions of health care services. The hospital is an ideal environment to attempt smoking cessation. A clinical question can be formulated using the PICO format, “What is the effectiveness of intensive smoking cessation intervention in promoting smoking cessation among hospitalized patients?” Eight studies were found with the inclusion and exclusion criteria. They were reviewed and critiqued, and their quality was assessed. According to the evidence in the eight studies, we concluded that intensive smoking cessation intervention during hospitalization can lead to high smoking cessation rates in patients after discharge.

In chapter 3 and chapter 4, the innovation was proved to be highly transferable, feasible and cost-beneficial. New evidence-based practice guidelines and recommendations were therefore introduced.

Communication plan with potential users

Effective implementation of the innovation depends on high quality communication. High quality communication makes the staff feel welcome, and allows open review and feedback across hierarchical levels and among peer groups (Simpson & Dansereau, 2007).
A clear mission and goals should be shared among the whole organization. Communication through the whole organization can reduce friction and lead the whole organization towards a common goal (Worley & Doolen, 2006). As the input and commitment of the stakeholders involved in the proposal are necessary for implementing the innovation effectively and smoothly, good communication with the stakeholders before the implementation and during the change process is important.

**Stakeholders.** Stakeholders include the department operations manager (DOM), ward managers (WMs), nursing officers (NOs) and all nursing staff in the general medical wards. The DOM and WMs have to agree to recruitment of three nurses from the general medical wards as a smoking cessation team. NOs have to help in reorganizing manpower for each shift. All nursing staff must understand the importance of the innovation, or otherwise, recruitment of staff will be difficult.

The medical staff is not involved in the implementation and smoking cessation counselling will not be done during physician consultation time. Therefore they are not considered stakeholders.

**Communication process.** Top-down organizational support is important to initiate and maintain implementation (Polit, 2012), and therefore, approval from administrators is important. If administrators do not understand the importance of implementing the innovation in the hospital, they may not support or agree to spend resources on it. Communication with WMs will be done first, as they are the effective change agents in developing evidence-based practice in a ward setting (Gerrish & Clayton, 2004). They must clearly understand the importance and cost-effectiveness of implementing an intensive smoking
cessation service for hospitalized patients who smoke with the evidence supported by the researchers. Also we need to show them the cost benefit and transferability of the innovation. With understanding and support from WMs, we must convince the DOM, a budget gatekeeper and policy maker, to accept the proposal.

After gaining approval and support from the administrators, we need to meet with all NOs in the general medical wards as they are responsible for manpower coverage each working shift. The reasons, transferability, feasibility, cost-benefit ratio and the details of the innovation will be introduced in order to seek their cooperation. After that, two briefing sessions for the general medical nursing staff will be held during the recruitment week. In the sessions, the reasons for and importance of the innovation will be addressed. The role of the recruited nurses and the details of the innovation will be described.

During pilot testing, comments from the DOM, WMs, NOs and nursing staff will be collected and evaluated.

**Communication methods.** Individual interviews are preferred in meetings with the WMs and DOM. Direct contact and responses are possible in individual interviews. We can then immediately discuss their uncertainties and responses in detail.

Although there are advantages for individual interviews, we cannot use this method to communicate with NOs and nursing staff. The large number of NOs and staff make this too time consuming. A small group meeting will be held among NOs in the same ward. Since NOs in the same ward have same practice in allocating manpower, their concerns and difficulties will be similar.

Two large meetings will be held for the nursing staff in the general medical wards. We will report on the reasons for the innovation. After receiving
approval and support from management staff, we will focus more on the process of recruitment, training, pilot testing, implementation and evaluation in the meetings with nursing staff.

**Sustaining the change process.** During the change process, we need to make sure there is no reversion to previous practice. To sustain the change process, we should make sure there are enough facilities and equipment available for the innovation, such as stationery and rooms for individual intervention if the bedside is not an ideal place for counselling.

Evaluation meetings with the trained nurses will be held during the seventh month and then every month afterwards to monitor patient outcomes and assess the compliance of trained nurses with the new guidelines. Success stories will be shared in the meetings to encourage the trained nurses to continue the innovation. If the trained nurses put a lot of effort into the innovation but do not see the results, they can become disillusioned and the implementation will not be well supported (Worley & Doolen, 2006).

Comments from different parties, such as the clinical staff, patients and relatives will be collected and evaluated. Revisions to the new guidelines will be made if necessary.

**Pilot testing.**

Pilot testing is an essential initial step in exploring the intervention. (Leon, Davis & Kraemer, 2011). This is a small scale preliminary study to evaluate the feasibility, cost, time and any adverse events, in order to improve the study design before full scale implementation (Leon, Davis & Kraemer, 2011; Hulley, Cummings, Browner, Grady & Newman, 2013). Pilot testing can help
staff avoid unexpected difficulties and decide whether revisions are needed before full-scale implementation of the new guidelines.

Pilot testing will be done in one general medical ward for four weeks. Ward nurses will assess and record patient details such as smoking and psychiatric status after admission. The trained nurses will approach those patients who smoke who are admitted with diagnoses other than psychiatric disorders. Intervention with individual counselling during hospitalization and postdischarge phone follow-ups will be introduced. The trained nurses will conduct cognitive-behavioural interventions using different skills learned in the three day training program from HKU Smoking Cessation Counselling Training Centre.

After four weeks of pilot testing, the feasibility of the innovation can be evaluated based on comments from different parties, such as the DOM, WMs, NOs and all nursing staff including the trained nurses. Although research findings show that long postdischarge follow-ups periods of at least six months are important for effective results, the pilot testing only lasts four weeks. The effectiveness of the innovation can still be evaluated by comparing the percentage of clients who quit smoking with those in other general medical wards without the intervention.
Chapter 6: Evaluation Plan

The intervention outcomes, and the nature and number of clients involved should be identified in the evaluation plan. We should decide when to measure outcomes and how to analyse the data. Also, we should determine the effectiveness of the guidelines.

**Intervention outcomes**

The clinical benefits of the innovation will be assessed in terms of client outcomes and healthcare provider outcomes.

**Client outcomes.** In the innovation, smokers admitted to the general medical wards will undergo an intensive smoking cessation intervention. This includes individual counselling during hospitalization and postdischarge phone follow-ups. The outcome of the innovation is the target patients’ smoking cessation rate at six months after discharge.

**Other outcomes.** The trained nurses’ knowledge and level of skill and confidence in smoking cessation counselling will be assessed.

**Outcome measurements**

Evidence from the research findings (Chouinard & Robichaud-Ekstrand, 2005; de Azevedo et al., 2010; Quist-Paulsen & Gallefoss, 2003), indicates a long period of postdischarge phone follow-ups of at least six months is important for effective results. Therefore the number of clients that have quit smoking at six months after discharge will be measured. The smoking status will be the self-reported seven-day point prevalence of no smoking. Self-report is a valid measure for tobacco abstinence (Barrueco et al., 2005) and is more feasible than
other methods, such as asking clients to provide samples for biochemical confirmation.

The knowledge and the level of skill and confidence of the trained nurses can be assessed using identical pre- and posttests before and after training. Assessment will be done at twelve-month intervals to monitor and maintain the standard of care.

**Nature and number of clients involved**

**Eligibility criteria.** Current smokers eighteen years old or older admitted to the general medical wards who are not admitted because of psychiatric disorders will be included in the innovation.

**Sample size calculation.** The calculation of the sample size is important to determine the optimum number of subjects required to be able to achieve scientifically and ethically valid results (Kadam & Bhalerao, 2010).

“Hard-core” smokers are those who have no intention to quit, have not attempted to quit, and have a high physical dependence on nicotine (Lam, Cheung, Leung, Abdullah & Chan, 2015). In Hong Kong, the government’s tobacco control measures have led to decreases in the percentage of daily cigarette smokers from 14% in 2005 to 10.7% in 2012 (Census and Statistics Department, 2013). However, the percentage of “hard-core” smokers has increased from 21.8% in 2005 to 27.4% in 2008 (Leung, Chan & Lam, 2011) which is higher than in other countries such as Canada (Costa, Cohen, Chaiton, Ip, McDonald & Ferrence, 2010) and the United States (Augustson & Marcus, 2004).

The smoking abstinence rates in the usual care group at six months in the studies of Chouinard & Robichaud Ekstrand (2005), and Murray et al. (2013) were 12.7% and 9%, respectively. As more of the target patients are “hard-core”
smokers in the target setting, the quitting rate of the usual care group at six months is conservatively expected to be 9%.

In the studies of Chouinard & Robichaud Ekstrand (2005), Smith & Burgess (2009), de Azevedo et al. (2010) and Murray et al. (2013), the differences in the quitting rates between the intervention and control groups at six months were 12%, 18%, 3% and 10%, respectively. The small 3% difference in the research of de Azevedo et al. (2010) may have been due to the extra fifteen minute individual counseling sessions in the control group. As our target setting has more “hard-core” smokers, the difference in the quitting rate between the intervention and control groups at six months is conservatively expected to be 7%. Therefore the postintervention quit rate at six months after discharge is expected to be 9% + 7% = 16%.

The software of the Java Applets for Power and Sample Size (Lenth, 2006-9) was used for analysis. The test for one proportion was chosen with the level of significance at 0.05 and the power at 80%. As the preintervention smoking cessation rate at six months after discharge is expected to be 9% and the postintervention smoking cessation rate at six months after discharge is expected to be 16%, the null value (Pₒ) was set at 0.09 and the actual value (P) at 0.16. The effect size of the sample was calculated and 154 subjects are needed.

Data management

Data management consists of data collection and data analysis.

Data collection. When patients are admitted to the general medical wards, their smoking status is recorded in the clinical notes by ward nurses. During hospitalization, patients who smoke will receive smoking cessation counselling. After discharge, they will receive phone follow-ups for at least six
months. At the six month postdischarge phone follow-up, self-report of the smoking status will be recorded. I will analyse and evaluate the collected data during the seventh month and then every month afterwards to assess the effectiveness of client outcomes.

Identical pre- and posttests will be given to the three trained nurses before and after the training. Healthcare provider outcomes will be evaluated based on the results of the pre- and posttests. Additional tests will be given yearly afterwards to make sure the trained nurses meet the required standards of knowledge, skills and confidence in smoking cessation counselling. The 9-item knowledge test in the research study “Evaluation of Tobacco Cessation Classes Aimed at Hospital Staff Nurses” will be used to assess the knowledge of the recruited nurses (Matten et al., 2011) (see Table 5). Confidence and skills in smoking cessation counselling will be assessed by the tool used in the research of Matten et al. (2011) (see Table 6). This is a self-rated tool with Likert-type responses. The level of confidence is measured using a five-point scale ranging from 1 (not at all confident) to 5 (extremely confident). Overall skill is scored using a five-point scale ranging from 1 (poor) to 5 (excellent).

**Data analysis.** Data analysis will be performed using SPSS software. The evaluation objective is to determine if the smoking cessation rate at six months after discharge has changed since the implementation of the innovation. The smoking cessation rate will be analysed using the z-test for one sample with the level of significance (alpha) at 0.05.

For healthcare provider outcomes, the paired t-test will be used to analyse the results of the pre-and posttests to evaluate effectiveness of training in
increasing the knowledge and level of skill and confidence of nurses in smoking cessation counselling.

**Criteria for effectiveness**

The criteria for effectiveness of the innovation are 1) to increase the smoking abstinence rate of the target patients after hospital discharge and 2) to improve the knowledge and the level of skill and confidence of the trained nurses in smoking cessation counselling.

**Client outcomes.** The evidence from the eight studies showed that if patients receive smoking cessation intervention with individual counselling during hospitalization and postdischarge follow-up calls, more of them will quit smoking after discharge.

The difference in the quitting rate at six months between the intervention and control groups ranged from 3% to 18% in the research findings (Chouinard & Robichaud Ekstrand, 2005; Smith & Burgess, 2009; de Azevedo et al., 2010; Murray et al., 2013). Since the real setting will have more “hard-core” smokers, it is expected the client outcomes will fall within the lower part of this range. Therefore, after intervention, a minimum increase of 7% in the quitting rate at six months after hospital discharge will be considered effective.

**Other outcomes (process indicators).** After training, it is expected the level of skill and confidence and knowledge of smoking cessation counselling of the trained nurses will increase, as shown by comparing pre- and posttest results.


Leung, D., Chan, S., & Lam, T. (2011). Prevalence and characteristics of hardcore smokers in Hong Kong. *Hong Kong: The University of Hong Kong*.


Figure 1

PRISMA 2009 Flow Diagram

Records identified through Cochrane Library (n = 419)

Records identified through PubMed limited to “Clinical trial” and “10 years” (n = 325)

Records identified through CINAHL Plus limited to “2003-2014” (n = 313)

Records identified through Google Scholar limited to “2003-2014” (n = 2350)

Records after duplicates removed (n = 430)

Records screened (n = 8)

Records excluded (n = 422)
1. Relevance of title and abstract (n = 367)
2. Study type (n = 0)
3. Inclusion criteria (n = 47)
4. Exclusion criteria (n = 8)

Full-text articles assessed for eligibility (n = 8)

Full-text articles excluded, with reasons (n = 0)

Studies included in qualitative synthesis (n = 0)

Studies included in quantitative synthesis (n = 8)
Table 1

*Table of Evidence*

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristic</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcomes measures</th>
<th>Effect size</th>
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<tr>
<td>Quist-Paulsen &amp; Gallefoss, 2003</td>
<td>RCT</td>
<td>Patients who are daily smokers and admitted for myocardial infarction, unstable angina or cardiac bypass surgery over 31 months in a general hospital in Norway. Mean age: 57 Mean cig/ day: 14.3 (IG), 15.6 (CG) Mean hospital stay (days): 6.9 (IG), 6.7 (CG)</td>
<td>Intervention group (IG) (patients are consulted once to twice during hospitalization emphasized on the health benefits and death reduction of smoking cessation, relapse prevention and use of nicotine replacement by reviewing a booklet. Encourage to use NRT. At least 5 FU calls over 5 months after discharge. An outpatient consultation at six weeks after discharge for relapse prevention) (n=118)</td>
<td>control group (CG) (group sessions twice a week with nurses mentioning the importance of smoking cessation) (n=122)</td>
<td>12 months</td>
<td>smoking cessation rate at 12 months by self report and biochemical verification.</td>
<td>Intervention - control (%) +13 (significant)</td>
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<td>Bibliographic citation</td>
<td>Study type</td>
<td>Patient characteristic</td>
<td>Intervention</td>
<td>Comparision</td>
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<td>Simon et al., 2003</td>
<td>RCT</td>
<td>medical and surgical patients who smokes more than 20 cigarettes during prehospitalization week at contemplation stage or action stage of quitting admitted to San Francisco Veterans Affairs Medical Center over 42 months period</td>
<td>30 to 60 mins intensive counseling, self help literature, 5 FU calls over 4 months, NRT therapy provided (n=107)</td>
<td>minimal contact (10 mins counseling, self help literature, NRT therapy provided identical to the intervention group) (n=106)</td>
<td>12 months</td>
<td>the biochemical of saliva sampling or proxy confirmation at 12 months</td>
<td>Intervention - control (%) +9 (RR: 1.6; 95%CI: 0.96-2.5, p=0.07)</td>
</tr>
<tr>
<td>Chouinard &amp; Robichaud-Ekstrand, 2005</td>
<td>RCT</td>
<td>patients who smoked at least one cigarette in a month prior, with CVD (myocardial infarction, angina, heart failure, or peripheral vascular disease) recruited from a cardiology unit within a hospital in Canada over 9 months period.</td>
<td>Average 40 mins inpatient counseling based on TTM model, 6 FU calls over 2 months based on TTM model, NRT provided for those with nicotine dependence (n=56)</td>
<td>Usual Care (general advice on smoking cessation) (n=56)</td>
<td>6 months</td>
<td>Primary (all confirmed by carbon monoxide confirmation in urine sample): 1) point prevalent smoking abstinence at 2 months 2) point prevalent smoking abstinence at 6 months 3) continuous smoking abstinence at 2 months 4) continuous smoking abstinence at 6 months Secondary: 5) progress through stages of change at 2 and 6 months</td>
<td>Intervention - control (%) 1) +21 (p&lt;0.07) 2) +22 (p&lt;0.05) 3) +21 (p&lt;0.06) 4) +12 (p&lt;0.21) 5) At 2 months, +21 (p&lt;0.04) At 6 months, +25 (p&lt;0.02)</td>
</tr>
<tr>
<td>Bibliographic citation</td>
<td>Study type</td>
<td>Patient characteristic</td>
<td>Intervention</td>
<td>Comparision</td>
<td>Length of follow up</td>
<td>Outcomes measures</td>
<td>Effect size</td>
</tr>
<tr>
<td>------------------------------</td>
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</tr>
<tr>
<td>Smith &amp; Burgess, 2009</td>
<td>RCT</td>
<td>smoker used tobacco in the month before admission admitted because of acute MI or for CABG in hospital of Canada over 15 months period</td>
<td>Intensive intervention (II) (minimal intervention plus 45-60 minutes of beside education and counseling with relapse prevention, behavioural, cognitive, and social support; take home materials, 7 FU calls over 60 days for support) (n=137)</td>
<td>Minimal intervention (MI) (review 2 pamphlets with patients, a note in patient's chart to remind physicians to deliver non smoking message, NRT provided if patient interested (n=139)</td>
<td>12 months</td>
<td>1) point smoking abstinence at 3 months self-report</td>
<td>Intervention - control (%)</td>
</tr>
<tr>
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<td></td>
<td>2) point smoking abstinence at 6 months self-report</td>
<td>Intervention - control (%)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>3) point smoking abstinence at 12 months self-report</td>
<td>Intervention - control (%)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>4) point smoking abstinence at 12 months self-report</td>
<td>Intervention - control (%)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>5) continuous 12 month abstinence</td>
<td>Intervention - control (%)</td>
</tr>
<tr>
<td>de Azevedo et al., 2010</td>
<td>RCT</td>
<td>All patients who are smokers with at least 1 cigarette daily prior to admission admitted to a public university hospital in Brazil over 9 months period</td>
<td>High-intensity intervention (HI) (30 mins individual tailored counseling by a trained smoking cessation counselor who performed MI, advice to seek help for smoking cessation after discharge, 7 FU calls over 6 months to reinforce motivation, no NRT support) (n=141)</td>
<td>Low-intensity intervention (LI) (15 min individual counseling by a trained counselor, advice to seek help for smoking cessation after discharge, no NRT support) (n=132)</td>
<td>6 months</td>
<td>Primary: 1) tobacco abstinence rate at 6 months</td>
<td>Intervention - control (%)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>2) number of cigarettes smoked daily (median)</td>
<td>Intervention - control (%)</td>
</tr>
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</tr>
</tbody>
</table>

- **Intervention - control (%)**
  - 1) +15 (OR: 2 ; 95% CI: 1.2-3.4, p=0.009)
  - 2) +18 (OR: 2 ; 95% CI: 1.3-3.4, p=0.003)
  - 3) +16 (OR: 2 ; 95% CI: 1.2-3.1, p=0.007)
  - 4) +19 (OR: 2 ; 95% CI: 1.3-3.6, p=0.002)
  - 5) +18 (p<0.01)
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristic</th>
<th>Intervention</th>
<th>Comparision</th>
<th>Length of follow up</th>
<th>Outcomes measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortega et al., 2011</td>
<td>non-randomized controlled trial</td>
<td>Internal medicine and surgery patients who are smokers admitted to the hospital in Spain over 12 months period</td>
<td>Group 1: 30-45 mins cognitive intervention every 3 days with free NRT support before discharge, 7 visits or phone calls as follow up over 12 months (n=924)</td>
<td>Group 3: minimal intervention Asking about patients' characteristics and their smoking habit (n=717)</td>
<td>12 months</td>
<td>1) smoking abstinence at 12 months (those with outpatient visit was confirmed by expiratory CO, those with phone FU was self-declared)</td>
<td>Intervention - control (%) 1) +20 (p&lt;0.001)</td>
</tr>
<tr>
<td>Smith et al., 2011</td>
<td>RCT</td>
<td>All patients who are smokers with tobacco use in last 30 days admitted in several participating hospitals in Canada over 16 months period</td>
<td>Intensive intervention (education, take-home materials, personally relevant counselling focused on self efficacy to remain abstinent, 7 FU telephone counselling within 60 days focused on relapse prevention, no NRT provided) (n=301)</td>
<td>Brief intervention (5 mins cessation advice personalised to patients, review of take-home pamphlets, notes in patient chart prompt physicians to provide smoking cessation message) (n=315)</td>
<td>12 months</td>
<td>Primary: 1) tobacco abstinence at 3 months self-report 2) tobacco abstinence at 6 months self-report 3) tobacco abstinence at 12 months self report 4) tobacco abstinence at 12 months confirmed by saliva sampling</td>
<td>Intervention - control (%) 1) +8 (OR: 1.42 ; 95%CI: 1.02 - 1.97) 2) +3 (OR: 1.15 ; 95%CI: 0.82 - 1.61) 3) +3 (OR: 1.12 ; 95%CI: 0.80 - 1.56) 4) +4 (OR: 1.24 ; 95%CI: 0.86 - 1.77)</td>
</tr>
<tr>
<td>Bibliographic citation</td>
<td>Study type</td>
<td>Patient characteristic</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Length of follow up</td>
<td>Outcomes measures</td>
<td>Effect size</td>
</tr>
<tr>
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</tr>
<tr>
<td>Murray et al., 2013</td>
<td>RCT</td>
<td>medical patients who are smokers or smoked within 4 weeks of admission admitted to 18 acute medical wards in a large teaching hospital in UK over 11 months period</td>
<td>intensive intervention (brief advice, referral to local service and at least one telephone follow up after discharge; those accepted cessation support have bedside counseling on systematic smoking ascertainment, behavioural support, NRT provided) (n=264)</td>
<td>minimal intervention (cessation support delivered at the initiative and discretion of clinical staff, NRT may be provided in accordance with the usual practice of doctors) (n=229)</td>
<td>6 months</td>
<td>Primary: 1) smoking cessation rate at 4 weeks, validated by measuring exhaled carbon monoxide 2) uptake of inpatient support 3) validated smoking cessation at 6 months</td>
<td>Intervention - control (%) 1) +25% (p=0.006) (excluding the oncology patients) 2) uptake of support is significantly higher in intervention group with p&lt;0.001 in all cases of support 3) +10 (p=0.37)</td>
</tr>
</tbody>
</table>
Table 2

*Table of Internal Validity of the Selected Studies*

<table>
<thead>
<tr>
<th>Section 1: Internal validity</th>
<th>Randomised controlled trial</th>
<th>Non-randomised controlled trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 The study addressess an appropriate and clearly focused questions</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1.2 The assignment of subjects to treatment groups is randomised</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1.3 An adequate concealment method is used</td>
<td>Yes</td>
<td>Can't say</td>
</tr>
<tr>
<td>1.4 Subjects and investigators are kept &quot;blind&quot; about treatment allocation</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Section 1: Internal validity</td>
<td>Randomised controlled trial</td>
<td>Non-randomised controlled trial</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>1.5 The treatment and control groups are similar at the start of the trial</td>
<td>Can’t say</td>
<td>Yes</td>
</tr>
<tr>
<td>1.6 The only difference between groups is the treatment under investigation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1.7 All relevant outcomes are measured in a standard, valid and reliable way</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>9%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Quist-Paulsen & Gallefoss, 2003
Simon et al., 2003
Chouinard & Robichaud-Ekstrand, 2005
Smith & Burgess, 2009
de Azevedo et al., 2010
Smith et al., 2011
Murray et al., 2013
Ortega et al., 2011
### Section 1: Internal validity

<table>
<thead>
<tr>
<th>Question</th>
<th>Randomised controlled trial</th>
<th>Non-randomised controlled trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9 All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
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<td>Yes</td>
<td>Yes</td>
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<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>1. 10 Where the study is carried out at more than one site, results are comparable for all sites</td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
<tr>
<td></td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
<tr>
<td></td>
<td>Does not apply</td>
<td>Can't say</td>
</tr>
<tr>
<td></td>
<td>Does not apply</td>
<td>Does not apply</td>
</tr>
</tbody>
</table>

- Quist-Paulsen & Gallefoss, 2003
- Simon et al., 2003
- Chouinard & Robichaud-Ekstrand, 2005
- Smith & Burgess, 2009
- de Azevedo et al., 2010
- Smith et al., 2011
- Murray et al., 2013
- Ortega et al., 2011
### Table 3

**Table of Overall Quality Assessment of the Selected Studies**

<table>
<thead>
<tr>
<th>Study</th>
<th>Bias Minimized</th>
<th>Direction of Bias</th>
<th>Effect due to Intervention</th>
<th>Results Applicable to Target Group</th>
<th>Overall quality Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quist-Paulsen &amp; Gallefoss 2003</td>
<td>High Quality (++)</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>High (+++)</td>
</tr>
<tr>
<td>Simon et al., 2003</td>
<td>Acceptable (+)</td>
<td>Since no blinding method, assignment to intensive intervention might increase the likelihood of quitting smoking in intervention group. This might lead to overestimation of the effect</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair (+)</td>
</tr>
<tr>
<td>Chouinard &amp; Robichaud-Ekstrand, 2005</td>
<td>Acceptable (+)</td>
<td>The high overall dropout rate was due to the high dropout rate in control group, which might lead to overestimation of the effect</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair (+)</td>
</tr>
<tr>
<td>Smith &amp; Burgess, 2009</td>
<td>High Quality (++)</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>High (+++)</td>
</tr>
<tr>
<td>de Azevedo et al., 2010</td>
<td>Acceptable (+)</td>
<td>Control group has more TRD patients which was a factor for smoking cessation. This might lead to underestimation of the effect</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair (+)</td>
</tr>
<tr>
<td>Smith et al., 2011</td>
<td>High Quality (++)</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>High (+++)</td>
</tr>
<tr>
<td>Study</td>
<td>Bias Minimized</td>
<td>Direction of Bias</td>
<td>Effect due to Intervention</td>
<td>Results Applicable to Target Group</td>
<td>Overall quality Rating</td>
</tr>
<tr>
<td>-------------------------------</td>
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</tr>
<tr>
<td>Murray et al., 2013</td>
<td>Acceptable (+)</td>
<td>All patients in respiratory wards were randomized to usual care group while all patients in cardiac wards were randomized to intervention group, this might lead to bias and high dropout rate might lead to bias</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair (+)</td>
</tr>
<tr>
<td>Ortega et al., 2011</td>
<td>Acceptable (+)</td>
<td>As no randomization, the level of motivation of the subjects might affect their rate of smoking abstinence, therefore the effect might be overestimated</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair (+)</td>
</tr>
</tbody>
</table>
### Table 4

**Summary of Material Costs**

<table>
<thead>
<tr>
<th></th>
<th>Unit price</th>
<th>Quantity</th>
<th>Period</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Set-up costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of hiring nurses</td>
<td>$200 per hour per nurse</td>
<td>40 hours each week per nurse</td>
<td>19.5 months</td>
<td>HKD $1872000</td>
</tr>
<tr>
<td>Training cost</td>
<td>$300 per hour</td>
<td>13 hours</td>
<td></td>
<td>HKD $3900</td>
</tr>
<tr>
<td><strong>Operational costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone fee</td>
<td>$48 per month per each telephone machine</td>
<td>3 machines</td>
<td>19.5 months</td>
<td>HKD $2808</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>HKD $1878708</td>
</tr>
</tbody>
</table>
Pretest and Posttest to assess Knowledge of Smoking Cessation Counselling

Knowledge test of smoking cessation counseling
1. Advise a correct smoking cessation medication for hypertensive female patient with bulimia
2. Can patient with nicotine patch shower or bathe?
3. How to diminish sleep disturbances while using the nicotine patch?
4. What is the length of time after quitting tobacco that most nicotine withdrawal symptoms resolve?
5. Is it true that tobacco users require multiple quit attempts?
6. When counseling a young adult woman using nicotine lozenge, is it appropriate to counsel about weight gain after quitting?
7. Should we strongly advise those patients who are not yet considering smoking cessation to quit and provide them with brief motivational interventions?
8. What is the most rapid method to administer nicotine into the bloodstream?
9. Do nicotine withdrawal symptoms include improved task performance?
Table 6

**Pretest and Posttest to assess the Level of Skill and Confidence of Smoking Cessation Counselling**

<table>
<thead>
<tr>
<th>Level of skill</th>
<th>poor</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall ability to help patients quit tobacco?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Level of skills for asking patients whether they use tobacco</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Level of skill for advising patients to quit</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Level of skill for assessing patients' readiness to quit</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Level of skill for providing tobacco cessation assistance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Level of skill for providing patient counseling</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of confidence</th>
<th>not at all confident</th>
<th>extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Confidence in your knowledge of appropriate questions to ask</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. Confidence in your skills to counsel for addiction</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. Confidence in your ability to provide motivation for those trying to quit</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. Confidence in your knowledge of pharmaceutical products</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. Confidence in your ability to know when to refer patients to physician</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. Confidence in your ability to sensitively suggest tobacco cessation</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. Confidence in your ability to provide adequate counseling</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8. Confidence in your ability to help recent quitters learn coping</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9. Confidence in your ability to counsel those not interested in quitting</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>