

**DEVELOPMENT AND EVALUATION OF A
HYBRID TOBACCO CESSATION CURRICULUM
(HTCC PROGRAMME) FOR MALAYSIAN
MEDICAL STUDENTS**

by

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Thesis submitted in fulfilment of the requirements

for the degree of

Doctor of Philosophy

December 2018

DEDICATION

This piece of work is dedicated to the memory of my late mother Daw Khin Swe Win, who taught me to persevere and prepared me to face challenges with faith, who passed away before the culmination of this journey.

ACKNOWLEDGMENT

In the name of God, the most gracious and the most mindful Lord, I offer my humble gratitude to you for giving me the strength to complete this thesis in spite of many challenges.

I would not have been able to finish this thesis without the immense support of many people. First and foremost, my sincere gratitude and appreciation go to my co-supervisor, Professor Dr Zulkifli Ahmad (Former Deputy Dean, PPSG, USM) for his commitment, constructive ideas, criticism, guidance, patience, and motivations from the beginning, throughout the long duration of writing to the completion of this thesis. His thought-provoking comments have always inspired me to go the extra mile. His passion for professionalism and intellectual curiosity was the key driver in this effort. I would also like to thank my Supervisor Dr Zulkarnain Sinor for his great help and support.

I am also greatly indebted to the late Professor Dr Rogayah Jaafar for putting efforts in reviewing the HTCC curriculum and the contents and giving valuable comments at the curriculum development stage and Professor Dr Syed Hatim Nyi Noor (aka) Nyi Nyi Naing for his insightful comments and guidance during the planning, implementation and evaluation stages. I wish to thank Professor Prof. Dr Hashami Bin Bohari (Dean, Kolej Universiti Insaniah)(Former Head of Campus, UniKL-Royal College of Medicine Perak) and the field supervisor Professor Dr. Osman Ali for their encouragement and kind assistance rendered to me throughout the implementation stage.

I sincerely thank my thesis examiners for the effort and time they spent reading and commenting on my work.

I would also like to express my sincere gratitude to Mr. Nor Azmi Zainal (Lecturer, Pusat Pengajian Sains Kesihatan, USM) and Professor Dato' Dr. Mohamed Amin Embi, Professor of Technology Enhanced Learning, Fakulti Pendidikan and Director, Centre for Teaching and Learning Technologies, UKM for providing technical trainings and guidance in e-Learning and e-content development.

I am also indebted to Professor Dato Dr. Khairul Anwar, Vice Chancellor of MAHSA University and the Dean Professor Dato Dr. Ravindran Jegasoth (Dean, Faculty of Medicine, MAHSA) for their tremendous support and continuous encouragement in the writing stage.

I am also thankful to Professor Emeritus Dato Dr. VG Kumar Das and Professor Dr. R Rajakrishnan for their tremendous support in project implementation and approval for utilizing university resources in creating teaching/learning materials. I am also grateful to QIUP staffs and students for their contribution in creating counselling role-play video clips.

A big thank you to the study participants, third-year medical students from UniKL-RCMP and AUCMS universities for their cooperation and enthusiasm to participate in this study. I would also like to express my sincere gratitude to Batch 7 final year medical students of AIMST University for their participation in the preliminary study.

I am also thankful to the supporting staffs of the Faculty of Medicine and IT staffs from UniKL-RCMP and QIUP.

I wish to remember my beloved late mother Daw Khin Swe Win (aka) Wendy Myo Han, who was instrumental in this accomplishment and I am very grateful for her unfailing support and encouragement. My greatest pleasure to share this moment with her. Due appreciation is also extended to my beloved father U Khin Nyo for his endless support and continuous encouragement throughout this journey. I owe special thanks to Ko Ko for his continuous encouragement and support throughout this endeavor.

Thank you all.

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LIST OF ABBREVIATIONS

5A's	Ask, Advice, Assess, Assist, Arrange
5R's	Relevance, Risks, Rewards, Roadblocks, Repetition
AIMST	Asian Institute of Medical Sciences and Technology University
ALP	Active Learning Programme
AUCMS	Allianze University College Of Medical Sciences
AUREC	AIMST University Research and Ethics Committee
CDC	Communicable Diseases Control
CME	Continuous Medical Education
CPG	Clinical Practice Guideline
CPHA	Canadian Public Health Association
DALYS	Daily Adjusted Life Years
DSL	Directed Self Learning
FA	Final Assignment
GATS	Global Adult Tobacco Survey
GEE	Generalised Estimation Equations
GHPSS	Global Health Professions Student Survey
GSPS	Global School Personnel Survey

GTSS	Global Tobacco Surveillance System
GYTS	Global Youth Tobacco Survey
HTCC	Hybrid Tobacco Cessation Curriculum
IPH	Institute of Public Health
KAP	Knowledge, Attitude, Practice
KAS	Knowledge, Attitude, Skills
KAS-SE-C	Knowledge, Attitude, Skills, Self-Efficacy, Competency of Tobacco Cessation
LMS	Learning Management System
MI	Motivational Interviewing
MIRIS	Motivational Interviewing via Role-play Internet Simulation
MOH	Ministry of Health Malaysia
MPOWER	Six policies to reverse the tobacco epidemic Monitor, Protect, Offer, Warn, Enforce, Raise
NCD	Non-Communicable Diseases
NHMS	National Health and Morbidity Survey
NRT	Nicotine Replacement Therapy
OSCE	Objective Structured Clinical Examination
PACE	Prevention And Cessation Education For Medical Students

PBL	Problem-based Learning
PPSG	Pusat Pengajian Sains Pergigian
PPSK	Pusat Pengajian Sains Kesihatan
Q & A	Questions & Answers
QIUP	Quest International University Perak – QIUP University
RxC	Treatment for Change Programme
SDL	Self-directed Learning
SEP	Smokescreen Education Programme
SP	Standardised patients
SPSS	Statistical Package for Social Sciences
SSM	Special Study Module
TC	Tobacco Cessation
TCC	Tobacco Cessation Counselling
TIBS	Tobacco Intervention Basic Skills
UniKL-RCMP	Universiti Kuala Lumpur - Royal College of Medicine Perak
USM	Universiti Sains Malaysia
V-PBL	Videotaped Problem-based Learning

**PEMBANGUNAN DAN PENILAIAN KURIKULUM
PEMBERHENTIAN TEMBAKAU HIBRID (PROGRAM HTCC)
BAGI PELAJAR-PELAJAR PERUBATAN MALAYSIA**

ABSTRAK

Doktor harus berpengalaman dalam proses pemberhentian pengambilan tembakau, harus mempunyai sikap positif terhadap pemberhentian pengambilan tembakau, dan harus yakin dan berkompeten dalam kemahiran kaunseling dalam pemberhentian pengambilan tembakau. Kajian mengenal pasti terdapat kekurangan pendidikan untuk berhenti merokok dan latihan formal di sekolah perubatan di seluruh dunia termasuk Malaysia. Percubaan komuniti untuk menggunakan pendekatan hibrid intervensi kurikulum pemberhentian tembakau (TC) berasaskan web telah dijalankan dalam kalangan 204 pelajar perubatan tahun tiga daripada dua universiti perubatan swasta di Malaysia Utara daripada 2012 hingga 2013. Mereka ditugaskan dalam kumpulan intervensi (104) dan kumpulan kawalan (100) dari universiti perubatan yang berbeza. Kaedah persampelan universal telah digunakan. Objektif kajian ini adalah untuk membandingkan pra-intervensi dan selepas intervensi skor purata dalam setiap kumpulan dan antara kumpulan. Program WTCC terdiri daripada 9 modul berasaskan web interaktif dan sesi praktikal bersemuka. Kelulusan etika dan persetujuan yang diakui telah diperolehi. Soal selidik yang telah disahkan diedarkan secara peribadi. Analisis statistik dijalankan menggunakan Persamaan Anggaran Umum (GEE) oleh SPSS versi 19. Terdapat peningkatan statistik yang ketara antara sebelum dan 6 bulan selepas intervensi oleh kumpulan intervensi dalam jumlah skor pengetahuan dalam TC dan TCC (MD

+6.68, 95% CI 2.85-10.51, $p < 0.001$), Skor-skor pengetahuan tertentu dalam intervensi TC dan TCC (5A dan 5R) (MD +2.10, 95%CI 1.20-3.10, $p < 0.001$), undang-undang tembakau dan penguatkuasaan (MD +1.68, 95%CI 0.85-2.50, $p < 0.001$), sikap positif terhadap peranan doktor dalam TC (MD +3.20, 95% CI 1.16-9.94, $p < 0.001$), skor keberkesanan diri dalam kemahiran asas klinikal TCC (MD +4.64, 95% CI 0.59-8.70, $p < 0.05$), skor latihan yang diperolehi dalam TCC (MD + 3.01, 95% CI 2.43-3.60, $p < 0.001$). Segi pengetahuan khusus mengenai campur tangan TC dan TCC ($p < 0.001$), pengetahuan tentang undang-undang tembakau dan penguatkuasaan ($p < 0.001$) dan dilihat halangan doktor di TC ($p < 0.05$) sikap positif ke arah TC ($p < 0.001$), sikap yang positif terhadap peranan doktor di TC ($p < 0.001$) dan diri-kecekapan dalam kemahiran komunikasi TCC ($p < 0.05$). Penyampaian hibrid kurikulum pemberhentian tembakau yang komprehensif, interaktif, dan berasaskan web (WTCC) bagi pelajar perubatan tahun tiga adalah berkesan dalam meningkatkan pengetahuan, sikap positif, keberkesanan diri dalam kemahiran kaunseling asas dan kecekapan diri dalam kemahiran komunikasi TCC. Oleh itu, ia harus diterima pakai dan disepadukan dalam kurikulum sekolah perubatan sarjana muda di Malaysia.

Kata kunci: berasaskan-web, kurikulum berhenti merokok, kaunseling, pelajar perubatan, pendidikan perubatan

DEVELOPMENT AND EVALUATION OF A HYBRID TOBACCO CESSATION CURRICULUM (HTCC PROGRAMME) FOR MALAYSIAN MEDICAL STUDENTS

ABSTRACT

Doctors should be knowledgeable in tobacco cessation, should have positive attitudes towards tobacco cessation, and should be confident and competent in tobacco cessation counselling skills. Studies identified lack of tobacco cessation education and formal training in worldwide medical schools including Malaysia. A community trial of the hybrid approach of web-based tobacco cessation (TC) curriculum intervention was conducted among 204 third year medical students from two private medical universities of Northern Malaysia. from 2012 to 2013. They were assigned into the intervention group (104) and control group (100) from a different medical university. Universal sampling method was applied. The objectives of the study were to compare pre-intervention and post-intervention mean scores of within each group and between groups. WTCC program comprised of 9 interactive web-based modules and face-to-face practical sessions. Ethical approval and informed consent were obtained. A validated self-administered questionnaire was administered. Statistical analysis was done by Generalised Estimated Equations (GEE) by SPSS version 19. There were statistical significant improvements between before and 6 months after the intervention of the intervention group in total general knowledge scores in TC and TCC (MD +6.68, 95%CI 2.85-10.51), $p < 0.001$, specific knowledge scores in TC and TCC interventions (5A's and 5R's brief clinical interventions and motivational interviewing) (MD +2.10, 95%CI 1.20-3.10,

$p < 0.001$), tobacco legislation and enforcement (MD +1.68, 95%CI 0.85-2.50, $p < 0.001$), positive attitudes towards role of doctors in TC (MD +3.20, 95%CI 1.16-9.94, $p < 0.001$), self-efficacy scores in basic clinical skills of TCC (MD +4.64, 95%CI 0.59-8.70, $p < 0.05$), acquired training scores in TCC (MD +3.01, 95%CI 2.43-3.60, $p < 0.001$). There were statistical significant differences between groups in terms of specific knowledge on TC and TCC interventions ($p < 0.001$), knowledge on tobacco legislation and enforcement ($p < 0.001$) and perceived barriers of doctors in TC ($p < 0.05$) positive attitudes towards TC ($p < 0.001$), positive attitudes towards role of doctors in TC ($p < 0.001$) and self-competency in communication skills of TCC ($p < 0.05$). The hybrid delivery of a comprehensive, interactive, web-based tobacco cessation curriculum (WTCC) for third year medical students was effective in improving knowledge, positive attitudes, self-efficacy in basic counselling skills and self-competency in communication skills of TCC. Hence, it should be adopted and integrated in undergraduate medical school curricula in Malaysia.

Keywords: web-based, tobacco cessation curriculum, counselling, medical students, medical education

CHAPTER 1

INTRODUCTION

1.1 Study Background

Today, the use of tobacco is the most crucial preventable cause of morbidity and mortality around the globe (World Health Organization, 2008a). Based on World Health Organization (2006) estimation, the yearly figure of tobacco-related deaths in the world is expected to rise from 4.9 million in the year 2000 to a figure that exceeds 10 million by 2020, unless compelling intercessions are being carried out. Two third of them will be from developing countries (Mackay *et al.*, 2006). Nearly 6 million people die annually from the use of tobacco, both from direct tobacco use and second-hand smoke (World Health Organization, 2011a). By the year 2020, it is estimated that this figure will rise to 7.5 million (Mathers and Loncar, 2006), which would represent 10% overall death cases. Around 71% of lung cancer, 42% of chronic respiratory disease and close to 10% of cardiovascular disease are associated with smoking. Smoking is also an important risk factor for communicable diseases such as tuberculosis and lower respiratory infections (Lin *et al.*, 2007). The highest incidence of smoking among men is in lower-middle-income nations. For the total population, smoking prevalence is the largest in upper-middle-income nations (World Health Organization, 2011a). If there is no serious action taken to control tobacco, the yearly deaths related to tobacco are expected to be 8 million by 2030, which would be 10% of overall death cases (World Health Organization, 2011a).

There are 1.2 billion smokers worldwide, whereby more than half of them are young smokers (Al-Sadat *et al.*, 2010). Southeast Asia encompasses of countries that are diverse in terms of culture, economy, society, and politics: Singapore, Malaysia, Cambodia, Brunei, Myanmar, Vietnam, Laos, Philippines, Indonesia, and Thailand. About 600 million tobacco consumers in Southeast Asia are contributing to around 50% tobacco users worldwide (Al-Sadat *et al.*, 2010). Among them, Malaysia has about 5 million smokers, 25% of whom (4.4 million) are adult current smokers (IPH, 2011), 20% are below 18 years old (Al-Sadat *et al.*, 2010).

Cigarette smoking is the main form of tobacco use in Malaysia (Fathelrahman *et al.*, 2009). Malaysian smokers use different kinds products based on tobacco like manufactured cigarettes (not including kreteks), hand-rolled cigarettes, kreteks (cigarettes made by blending tobacco, cloves, and other flavors, also known as clove cigarettes), tobacco-filled pipes, cigars (curut) or cigarillos, shisha or hookah, and bidis. A small number of Malaysian adult smokers use smokeless tobacco. Smokeless tobacco can be chewed or applied to the teeth and gums. It can also be sniffed. In Malaysia, smokeless tobacco products include those that can be chewed like betel quid with tobacco, snuff, gutkha, paan masala, and other products (IPH, 2011).

In Malaysia, an estimated of one-quarter of Malaysians mortality every year (almost 10,000) are due to smoking-related diseases (Fathelrahman *et al.*, 2009). According to Malaysian National Health and Morbidity Survey (NHMS), the prevalence of smoking among adults of 18 years old and older has reduced from 24.8% (Institute for Public Health, 1997) to 22.8% (Institute for Public Health, 2008) (Lim *et al.*, 2013) (Lim *et al.*, 2009). This indicates that the smoking prevalence in Malaysia has reduced by only 2% between 1996 and 2006. The decrease that is

noted, which is considered significant statistically, is quite moderate compared to other nations that have seen a drop in smoking prevalence by 9% to 25% after more than 10–20 years implementing anti-tobacco measures (Abadie *et al.*, 2010; Levy *et al.*, 2008).

The prevalence of smoking is still very high, especially in men (49.2% in 1996, 46.4% in 2006). Nearly half of Malaysian men smoke, whereas only a few (1.6%) women do (World Health Organization, 2010). Institute of Public Health (2011) reported that the smoking prevalence among adolescents and adults of 15 years old and above was 23.1% (approximately 4.75 million) (men 43.9%, women 1%). It was observed that the prevalence of smoking among men still remains high in 2011. In 2015, the current prevalence of adult smokers above 15 years was 22.8% (Male 43%, female 1,4%). There was a small decrement from the 23.1% reported in GATS 2011 (NHMS, 2015).

The prevalence of smoking in youth signifies steadily increasing high rates of morbidity and mortality due to smoking in the future. The Global Youth Tobacco Survey (Warren *et al.*, 2009) found that 19.5% of 13 to 15-year-olds have used tobacco products in one forms or another, whereby 18.2% smoke cigarettes and 9.5% use other tobacco products. Patterns of tobacco use among young Malaysian shows the trend of tobacco use among adults. Furthermore, the prevalence of cigarette in the teenage male is a lot higher (30.9%) than among teenage female (5.3%). Nevertheless, the 5.3% is a lot higher than the 1.6% among adult women, which increases the alarming possibilities that the rate of smoking among women will notably increase in future (World Health Organization, 2011b).

By gender during the period of 1996 to 2006 (NHMS I – NHMS II), the male smoking prevalence decreased just 0.8%, from 49.2% to 48.8%, while for women the prevalence decreased from 3.5% to 1.9%, a 46% reduction. A decline in smoking prevalence was observed in every state in Malaysia except for Perlis, which showed an increase of 4.9%. The declining trend was most notable in the Federal Territory of Kuala Lumpur and in Selangor, Malacca, and Kelantan (NHMS II, NHMS III Malaysia Report). In 2015, it was observed that the prevalence of male smokers had reduced slightly from 43.9% in 2011 to 43% in NHMS 2015 (NHMS 2015). The reduction in smoking prevalence could be due to the effective control programmes offered by the Ministry of Health Malaysia.

1.1.1 Smoking Cessation Behaviour

Nearly 50% (48.6%) of adult smokers (former and current smokers who had stopped smoking not more than a year) put in the effort to stop smoking over the past one year. Eighty percent of smokers who tried to stop smoking in the last 1 year had put in effort doing so by not getting any help. As a whole, only 14.3% of the present smokers had the idea to or were considering to quit smoking in the coming 1 year. Only 50% of present smokers who had consulted a health caregiver over the last 1 year were told to stop smoking from the provider (IPH, 2011).

As per GATS statistics, 39.9% of men, 0.7% of women, and 20.9% overall (4.3 million) adults at present smoke tobacco daily. Among those who have smoked daily, only 9.5% have stopped smoking (IPH, 2011).

In 2015, it was reported that more than half (52.3%) of the present smokers tried to stop smoking over the last one year. The proportion of attempt to quit was higher in females than their male counterpart. It was also observed that the trial to stop was highest among present smokers in the 25-29 years age group at 56.8% compared to those 75 years and above (Institute for Public Health, 2015).

1.1.2 Smoking Cessation Services

As of December 2010, there were 326 quit-smoking clinics and 32 hospitals within the MOH facilities throughout the country that provided smoking cessation services, which include the counselling and pharmacotherapy for quitting smoking. These heavily subsidized cessation services use an algorithm set included in the Clinical Practice Guidelines (2003), which are in the process of being reviewed and updated with the inclusion of varenicline (Champix) for use as pharmacotherapy. In late 2011, the Pharmaceutical Division, MOH registered Varenicline (Champix). By establishing the 'Infoline' and 'Quitline' and tobacco by the Ministry of Health and the National Poison Centre, respectively, smokers were given further accessibility to cessation assistance who intend to stop smoking (IPH, 2011).

In Malaysia, the likelihood of Malay adults to be inquired about smoking (77.2%) and to be counselled to quit smoking by their medical advisors (59.9%) when compared to their Chinese counterparts (43.4% were asked, 33.1% were advised). A significant percentage of Indians attempted to quit (60.6%) and visited health care provider (44.7%). A significant amount of Muslims was asked about their smoking habit (75.0%) and have been advised to quit (58.8%) by their doctors than the ones who are not Muslims (44.7% asked, 33.4% advised) (IPH, 2011). In 2015, approximately, 75.4% of present smokers who sought healthcare services over the

past 1 year had been advised to stop smoking by medical advisors. A higher proportion of current male smokers (76.2%) were advised by medical advisors as compared to females (60.3%). Young smokers from the age of 18 to 19 year old were most frequently being told to quit smoking (90.2%). The highest prevalence of present smokers being advised to stop was reported in Terengganu (92.9%), followed by Negeri Sembilan (89.4%) and Perak (88.4%) (Institute for Public Health, 2015).

1.1.3 Training of Doctors In Smoking Cessation

Substantial knowledge gaps and deficits in practical training with regards to smoking cessation counselling in undergraduate medical students have been identified by studies across the world. To our knowledge, formal teaching and training of tobacco cessation are lacking, particularly on tobacco cessation counselling among undergraduate medical students in medical school curricula in Malaysia. There are not many publications regarding medical student's knowledge, attitude, acquired training and competency on tobacco cessation carried out by undergraduate medical students in Malaysia. A study conducted in Malaysia recommended that a tobacco cessation module for medical students must be added to the curriculum of every medical school in Malaysia. The education intervention will not only help medical students to become good educators but also prevent them from picking up the smoking habit (Rashid, 2011).

Another Asian study, including Malaysia, also reported that majority of medical students expressed on doctor's role in tobacco control as being role models, competence in tobacco cessation methods, counselling, and the need for tobacco cessation training in medical schools. About 50% agreed to the fact that the curriculum in place at the moment educates on tobacco smoking but not in a

systematic manner and it must be added as a separate module (Sreeramareddy *et al.*, 2010).

The above studies suggested that medical educators must attempt to revise the current medical curriculum to include tobacco cessation counselling training module at Malaysian medical school.

1.2 Problem Statement

Doctors should be an anti-smoking role model who has smoking cessation skills both directly and indirectly (Nett, 1990). Nearly 70% of smokers reported seeing a doctor each year and doctors most likely have extensive contact with smokers and the potential to help so many smokers quit (Rubin *et al.*, 1996). Doctors have an important role to play in the identification, evaluation, treatment, follow-up, and referral of smokers (Ockene, 1987). There are a number of reasons for doctors being an important agent for promoting smoking cessation, such as accessibility, patient's acceptance, doctor's acceptance to their role, and doctor's knowledge, attitudes and skills in tobacco cessation. Even discussing three minutes with every patient to quit smoking and the benefits of quitting smoking have proven to be cost-effective (Owen, 1989).

Doctors must ask all patients above the age of 15 on smoking and if they use tobacco on every visit, offer help on quitting to smokers, and assist patients to quit smoking when they are prepared to do so. Ideally, physicians can counsel and teach smokers on the adversity of smoking and counsel about tobacco cessation. A study reported that majority doctors view their responsibility not just to treat illness, but

also as an adviser to patients (Cockburn *et al.*, 1987). Another study also reported that all medical practitioners that were surveyed believe it is their responsibility to assist patients to stop smoking (Cohen *et al.*, 2007). Nevertheless, physicians view present smoking cessation tools as insufficient as they have insufficient resources, services, and support from the organization and limited training and education for physicians to address the use of tobacco and cessation interventions.

The five common significant barriers to successful interventions most often cited by doctors are (1) lack of motivation in patient (63%), (2) interventions facing limited coverage (54%), (3) limited reimbursement for a doctor's time (52%), (4) limited contact time with patient (41%) and very few cessation programmes available (39%). Doctors view that patients hold a notable responsibility in smoking and quitting. Nevertheless, there is no evidence that these beliefs are associated with their participation levels in cessation activities. Doctors also reported being unconfident on their capability to encourage smokers to quit (44%), make referrals (34%), or monitor patient progress (33%) (Cohen *et al.*, 2007). A study on doctors' knowledge regarding the side effects of smoking and their attitude towards it was found to have a direct impact on encouraging patients to quit smoking habits. Moreover, providing effective counselling has direct relationships with the educational training of the practitioner (Johnston *et al.*, 2005). In India, most physicians feel ill-prepared for advice and are not offering tobacco cessation counselling to their patients. This attributes to lack of appropriate training among the undergraduate medical schools (Pati, 2005).

Physicians should be knowledgeable and skilful in tobacco cessation techniques and confident in delivering cessation counselling to the smokers. Hence, it is critical to train medical undergraduates in tobacco prevention and cessation

skills to have competent doctors who are ready to work on the severe level of morbidity and mortality linked with tobacco use and to perform tobacco cessation counselling.

A global survey of tobacco curriculum carried out a decade ago discovered that only eleven percent of medical institutions had allocated special teaching hours pertaining to smoking and tobacco cessation (Richmond *et al.*, 1998). Moreover, a series of noteworthy international studies reported severe lack in tobacco cessation counselling skills and knowledge among medical students (Goldberg *et al.*, 1993; Coultas *et al.*, 1994; Wang *et al.*, 2006; Blumenthal, 2007; Raupach *et al.*, 2009; Kusma *et al.*, 2010; Hawari and Bader, 2014). There was a number of international studies that addressed the gap in tobacco cessation counselling training in medical schools worldwide (Spangler *et al.*, 2002; Roddy *et al.*, 2004; Botelho *et al.*, 2009).

Recent studies on medical education in various European countries have constantly shown that undergraduate training in tobacco cessation is insufficient (Grassi *et al.*, 2014). The lack of training appears to translate into deficiencies regarding the clinical management of smokers, only 50% in the final year advised every smoker to quit smoking. In fact, the lack of training has been suggested as one major factor discouraging doctors from providing adequate advice to smokers (Twardella and Brenner, 2005).

A recent study in Lebanon reported that medical students did not feel knowledgeable about pharmacotherapy and its effectiveness in tobacco cessation (Jradi *et al.*, 2014).

Medical student's personal traits and beliefs about smoking are developed at the time of their undergraduate medical studies, and any effective tobacco cessation

interventions in the medical profession should be initiated before graduating from medical school. Teaching curriculum that emphasizes the obligation of doctors, specifically in preventing disease and training with regards to tobacco cessation techniques must be included in undergraduate curriculum (Kusma *et al.*, 2010). It was recommended that every medical school curriculum must include a tobacco module (Kusma *et al.*, 2010).

In India, after curriculum review of the extent of teaching tobacco control and cessation in the current medical school curricula, it was found that although tobacco's negative effects are infused in some way in the curricula, it is neither systematically nor vertically integrated and the skills and competence surrounding anti-tobacco counselling were not even mentioned in the curricula. This has resulted in insufficient knowledge of the epidemiology of smoking, benefits of smoking cessation, smoking cessation interventions, treatment of tobacco dependence (Jradi, 2014), and perceived lack of effectiveness among the physicians to intervene (Pati, 2012). It was identified that there is a need for collaboration between practising clinicians, the curriculum planners of the country, and the medical faculty to incorporate tobacco cessation into the medical school curriculum (Pati, 2012). It is important to address this deficit by prioritizing these topics in medical school curricula (Jradi and Al-Shehri, 2014).

It was observed that a tobacco intervention curriculum can enhance relevant knowledge, self-confidence, and attitudes and be infused in students' early clinical experiences (Pati, 2012).

There are a number of well-conceived educational interventions to improve knowledge, attitude, and skills of medical students pertaining to the treatment of

smokers (Richmond and Taylor, 2006; Leone *et al.*, 2009; Schmelz *et al.*, 2010). High-quality research on ways to implement educational curricula interventions with an aim to improve counselling skills was readily available (Hauer *et al.*, 2012), but its reach is hugely restricted to readers with a specific interest in medical education. If present lack of medical training were noticed and efforts focused on ways to overcome them, then change is likely to occur (Raupach *et al.*, 2014b).

A recent study highlighted that a need for straightforward and comparatively simple but at the same time implementable and effective tobacco curricula is there. For instance, even a single lecture on the topic could be sufficient to arouse the interest of students obtaining self-directed learning activities regarding tobacco toxicology and treatment choices. The more high-quality study is clearly needed in this area (Raupach *et al.*, 2014b). It was proven in many studies that a combined strategy of educational and interactive training during medical school improves knowledge, counselling skills, and attitude on tobacco cessation as well as behavioural change among medical students (White *et al.*, 2007b; Hauer *et al.*, 2012). Another study proved that online tobacco cessation skill-building courses can impose a good effect on students' skills and knowledge and can be utilized across health behaviours in promoting healthy lifestyles (White *et al.*, 2007b). The findings of this study also supported that there is a need to disseminate tobacco cessation courses like this to more medical schools (White *et al.*, 2007b). A study of a curriculum on smoking cessation and prevention that is web-based for US medical students proved that the student's self-rated counselling skills were successfully improved, which gives the scope for training medical practitioners, the educational modules might be discovered helpful by rehearsing specialists and other medical

services experts who would like to enhance their abilities in tobacco prevention and discontinuance (Pederson *et al.*, 2006).

Educating health professionals on the importance of smoking that causes disease is the first step. Training doctors could elevate the likelihood of counselling smokers to stop smoking (Kottke *et al.*, 1989). Nevertheless, medical advice on smoking must not be limited to one class or workshop as it has to be integrated vertically across the medical studies and practicums. Over the first years of medicine, the goal should be primarily on the epidemiology of smoking and clinico-pathological problems with a focus in clinical years moving to teaching and training basic clinical skills in tobacco cessation counselling. Based on the above evidenced-based literature regarding the gaps in teaching and training of TCC to clinical medical students, it is imperative to develop a comprehensive TCC curriculum and to provide training TCC skills to clinical medical students in Malaysia.

1.3 The Rationale of this Research

In Malaysia, there was some published literature on knowledge, practice (KAP) and attitude of smoking among Malaysian medical students. However, there is limited literature reported on the perceptions of the role of medical doctors in tobacco cessation, knowledge, attitude, and skills of medical students in tobacco cessation counselling and the extent of educating on tobacco and tobacco cessation in medical school curricula in Malaysian medical schools. Sreeramareddy *et al.* (2010) found that most students (> 80%) agreed that the role of doctors is important in tobacco cessation of patients and about doctors being role models in tobacco control, whereby they should ask every patient about tobacco smoking, and all medical

practitioners must have the skills about tobacco cessation counselling and the need for training on tobacco cessation in medical colleges.

This study also addressed the gaps in the practice of medical students on tobacco cessation counselling. A majority (> 80%) of students enquired their patients on their smoking habit during clinical postings/clerkships. However, only one-third of them helped the patients' willingness to quit and did counselling for the patients (Sreeramareddy *et al.*, 2010).

With regards to the education on tobacco in their medical curriculum, only one third reported that they were being educated sufficiently on consequences of smoking on health effects, and methods of tobacco cessation. Almost 50% of the students felt the need for training on tobacco cessation methods which includes counselling as present training on tobacco smoking is not organized and should be infused with other disciplines. Nearly fifty percent of undergraduates agreed to the idea that medical school curriculum must have a distinct module on tobacco cessation education. It was reported that more than half of the undergraduates identified the subjects on health effects of smoking, nicotine treatment and addiction, relapse prevention, and counselling to be very important in training about tobacco smoking (Sreeramareddy *et al.*, 2010). Nordin *et al.* (2015) conducted a study to decide on knowledge and practices in offering smoking cessation counselling support amidst junior doctors at University Malaya Medical Centre. It was found that 71% reported that they acquired cessation training at the medical faculty. The majority (90%) of them asked patients about their smoking status. However, only 52% asked about quitting, whereas 61% felt that they lacked the confidence to offer help to quit, especially female doctors. Most of the students (80%) were not aware of local cessation clinics, and about 60% were unaware of the existence of clinical practice

guidelines for smoking cessation. Hence, asking about smoking status (Yes or No) was carried out at a satisfactory level. However, low knowledge, skills, and confidence with regards to tobacco cessation counselling among Malaysian junior doctors indicated that there is an urgent need for tobacco cessation education to be included in undergraduate and in postgraduate medical curricula in Malaysia (Nordin *et al.*, 2015).

Basically, medical educators must consider reviewing existing medical teaching plan to enhance training about tobacco smoking cessation in the faculty of medicine in Malaysia. It can be achieved by the inclusion of a separate module on tobacco cessation counselling in clinical years, not only systematic integrating with other disciplines in pre-clinical years. In order to fill the gap in tobacco cessation counselling training in Malaysian medical schools, there is a critical need for the development, implementation, and evaluation of an effective tobacco cessation curriculum module to meet the local needs. Therefore, this study attempts to equip the medical students of clinical years with tobacco cessation knowledge and training basic clinical skills (5 A's and 5R's brief clinical interventions) in tobacco cessation counselling to prepare them to become confident and competent doctors for the community and the country as a whole.

This education interventional study aimed to increase knowledge, attitude, and self-efficacy in basic clinical skills of counselling and self-competency in communication skills of tobacco cessation counselling by introducing an innovative hybrid tobacco cessation curriculum (HTCC) in a hybrid learning approach. No such interventional study has ever been carried out in which it addresses the development and evaluate the effectiveness of tobacco cessation counselling curriculum among Malaysia medical students. This study would raise the awareness on the importance

of tobacco cessation education among medical educators, medical students, and Deans of medical schools in Malaysia.

1.4 Research Objectives

1.4.1 General Objective

To study the effectiveness of a Hybrid Tobacco Cessation Curriculum (HTCC) for medical undergraduates in Malaysia.

1.4.2 Specific Objectives

This study embarks on the following objectives:

- **PHASE I**

1. To assess the knowledge, attitude, self-efficacy in basic clinical skills and self-rated competency in communication skills towards tobacco cessation counselling among final year Malaysian medical students from AIMST University of Northern Malaysia.

- **PHASE II:**

1. To design and develop a comprehensive hybrid tobacco cessation curriculum for third year medical students of UniKL-RCMP of Northern Malaysia.
2. To create counselling video clips with the simulated patients (smokers) – Malaysian video case scenarios.
3. To install “HTCC e-Learning Programme” on Moodle LMS.
4. To conduct pilot-testing of “HTCC e-Learning Programme” (HTCC TRIAL).

- **PHASE III:**

1. To carry out training needs assessment for Tobacco Cessation Counselling among third year clinical medical students (non-intervention group) of UniKL-RCMP.

- **PHASE IV:**

1. To carry out online course technical savvy survey among the third year medical students of the intervention group before implementation at UniKL-RCMP.
2. To implement a comprehensive hybrid tobacco cessation curriculum among Year three medical students of UniKL-RCMP.

- **PHASE V:**

1. To assess the effectiveness of the comprehensive hybrid tobacco cessation curriculum among Year three medical students of UniKL-RCMP and to compare with the control group of clinical medical students of AUCMS.
2. To collect medical students feedback on HTCC Programme among the medical students of the intervention group of UniKL-RCMP

1.5 Hypothesis

1. The programme is effective in increasing knowledge scores between pre-intervention and post-intervention measures towards tobacco cessation among intervention group and control group of third-year clinical medical students of private medical universities in Northern Malaysia.

2. The programme is effective in improving attitude scores between pre-intervention and post-intervention measures towards tobacco cessation among intervention group and control group.
3. The programme is effective in increasing self-efficacy scores between pre-intervention and post-intervention measures towards basic clinical skills of tobacco cessation among intervention group and control group.
4. The programme is effective in increasing self-competency scores between pre-intervention and post-intervention measures towards communication skills of tobacco cessation among intervention group and control group.
5. The programme is effective in improving acquired training scores in tobacco cessation between pre-intervention and post-intervention measures towards tobacco cessation among intervention group and control group.

1.6 Conceptual Framework of the Study

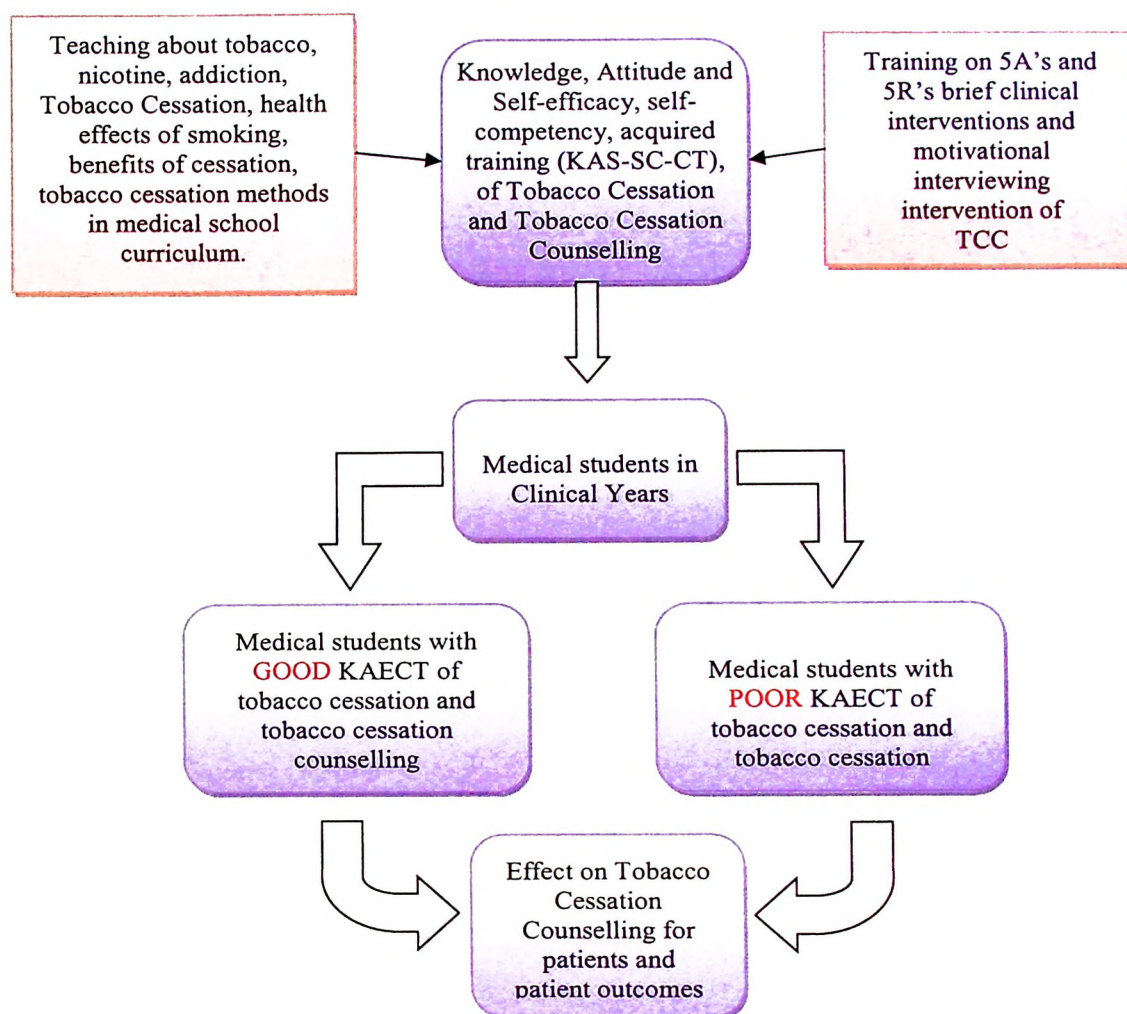


Figure 1.1 Conceptual Framework of the Study

As shown in the above figure, it was conceptualised that Knowledge, Attitude and Self-efficacy, self-competency, acquired training (KAS-SC-CT), of Tobacco Cessation and Tobacco Cessation Counselling among medical students depend on Teaching about tobacco, nicotine, addiction, Tobacco Cessation, health effects of smoking, benefits of cessation, tobacco cessation methods in medical school curriculum (Khan *et al.*, 2005; Guiffre, 2009; Cauchi and Mamo, 2012; Al-

Haqwi et al., 2010). and Training on 5A's and 5R's brief clinical interventions (Allen *et al.*, 1989; Roche *et al.*, 1996b; Ferry *et al.*, 1999; Fiore *et al.*, 2000a; Spangler *et al.*, 2002; Fiore *et al.* 2008) and motivational interviewing intervention of TCC (Papadakis *et al.*, 1997; Skochelak *et al.*, 2001; Deveugele *et al.*, 2005). Moreover, Medical students who are knowledgeable and skilful in TCC would have effect on providing tobacco cessation counselling services for patients and patient outcomes (Khan *et al.*, 2005; Guiffre, 2009; Cauchi and Mamo, 2012).

1.7 Operational Definition

Curriculum

It refers to the lessons and academic content taught in a school or in a specific course or program.

e-Learning

Learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom.

Smoking

The process of inhaling the smoke of burning tobacco encased in cigarettes, cigars and pipes.

Nicotine

A colorless, poisonous alkaloid that occurs naturally in the tobacco plant. It is used in medicine and as an insecticide. It is the substance in tobacco products to which smokers can become addicted.

Nicotine dependence

A physical and/or psychological dependence characterized by both tolerance and withdrawal symptoms in relation to nicotine use.

Tobacco Cessation

Tobacco Cessation therapy consists of procedures that educate smokers about the dangers of smoking, convince smokers to stop smoking, motivate them to smoking abstinence, and assist them in their endeavours to quit by way of counselling and pharmaceutical interventions.

Tobacco Cessation Counselling

The act of asking about the patient's smoking status, advising patients to quit smoking, challenging them to quit, and providing options for tobacco cessation methods or strategies.

Brief clinical interventions

Brief interventions for tobacco use focus on enhancing tobacco users' motivation to change and connecting them with evidence-based resources to help make the next quit attempt a success.

5A's brief clinical intervention

The 5 A's method for brief interventions has substantial research support for its utility in helping tobacco users across a variety of settings and can be incorporated with motivational strategies in a step-by-step process. 5A's intervention consists of Ask, Advise, Assess, Assist and Arrange.

5R's brief intervention

For patients not willing to make an attempt at quitting, clinicians should provide a brief intervention to promote the motivation to quit. Motivation is also important for patients who do express interest in quitting. Ask patients to state their reasons for

wanting to quit. Hearing their own answers helps strengthen their commitment, and provide positive reinforcement by supporting their reasons. Motivational interventions can be divided into 5 basic types, or the 5 R's: Relevance, Risks, Rewards, Roadblocks, and Repetition (Fiore et al. 2008).

Motivational interviewing

The principles of motivational interviewing can be used to increase the likelihood that a patient who does not want to quit tobacco use will decide to quit. Motivational interviewing is a directive, patient-centred counselling style for eliciting behaviour change by helping patients to explore and resolve ambivalence.

Motivational Interviewing Techniques

The four motivational techniques include developing discrepancies, how to express empathy, how to support self-efficacy and rolling with resistance.

Self-efficacy

Self-efficacy is a widely accepted theory of behaviour acquisition, maintenance, and change and is best explained in the context of social learning theory as developed by Albert Bandura (Bandura, 1977). In other words, self-efficacy encompasses a person's confidence in their own ability to participate in a certain behaviour.

Self-competency

Self-assessment of the competency in tobacco cessation counselling. Future doctors should develop competency to communicate effectively with patients in tobacco cessation.

Communication skills in TC

Communication is the transfer of information meaningful to those involved. Interactive communication is a process that facilitates a dialogue to provide multiple

opportunities to accurately interpret the meaning and respond appropriately. It is basic counselling skill in tobacco cessation counselling. Sufficient doctor-patient communication is linked to better health outcomes, compliance, and patient satisfaction. There is no golden standard on “good doctor-patient communication”, patient-centred care, building rapport with patients, negotiating, facilitating patient’s cooperation and motivating the smokers who are not willing to quit smoking are the main aspects of the so-called good communications in TCC (Deveugele et al, 2005).

Hybrid approach

It is a blended approach whereby online learning is being integrated with traditional in-class learning.

Stages of Change Model (Transtheoretical Model)

This model is a theoretical construct that addresses the readiness of individuals to change their behaviour and consists of six stages (Prochaska & DiClemente, 1983).

1. Pre-contemplation: No intention to take action within the next 6 months
2. Contemplation: Intends to take action within the next six months.
3. Preparation: Intends to take action within the next 30 days and has taken some steps in this direction.
4. Action: Has changed overt behaviour for less than 6 months.
5. Maintenance: Has changed overt behaviour for more than 6 months.
6. Relapse: Regression to a previous behaviour

Acquired training in TCC

The training in TCC acquired by medical students in their medical school.

CHAPTER 2

LITERATURE REVIEW

2.1 Global Health Risks - Tobacco Use

Tobacco smoking is a global public health risk, which causes increased morbidity and mortality of many diseases in both developing and developed countries. The main risk for mortality globally is high blood pressure that causes 13% of global deaths, the use of tobacco (9%), high glucose level in the blood (6%), sedentary lifestyle (6%), and obesity and overweight (5%) (World Health Organization, 2009b). The risk raises the risk for other chronic diseases like heart disease, cancers, and diabetes. These diseases impact nations across people from all income groups (World Health Organization, 2009b). Eight risk factors have contributed to 75% of cases of coronary heart disease which is the primary cause of death around the world. These risks are consumption of alcohol, the high glucose level in blood, the use of tobacco, high blood pressure, high level of cholesterol, high body mass index, low consumption of fruit and vegetable and sedentary lifestyle. Many of deaths resulting from these risks happen in developing countries. It was also reported that 71% of Lung Cancer deaths are caused by tobacco smoking. Tobacco accounted for 18% of deaths in high-income countries (World Health Organization, 2009b).

As shown in Figure 2.1, over time, major risks to health shift from traditional risks (e.g. inadequate nutrition or unsafe water and sanitation) to modern risks (e.g. tobacco). Modern risks may take different trajectories in different countries, depending on the risk and the context.

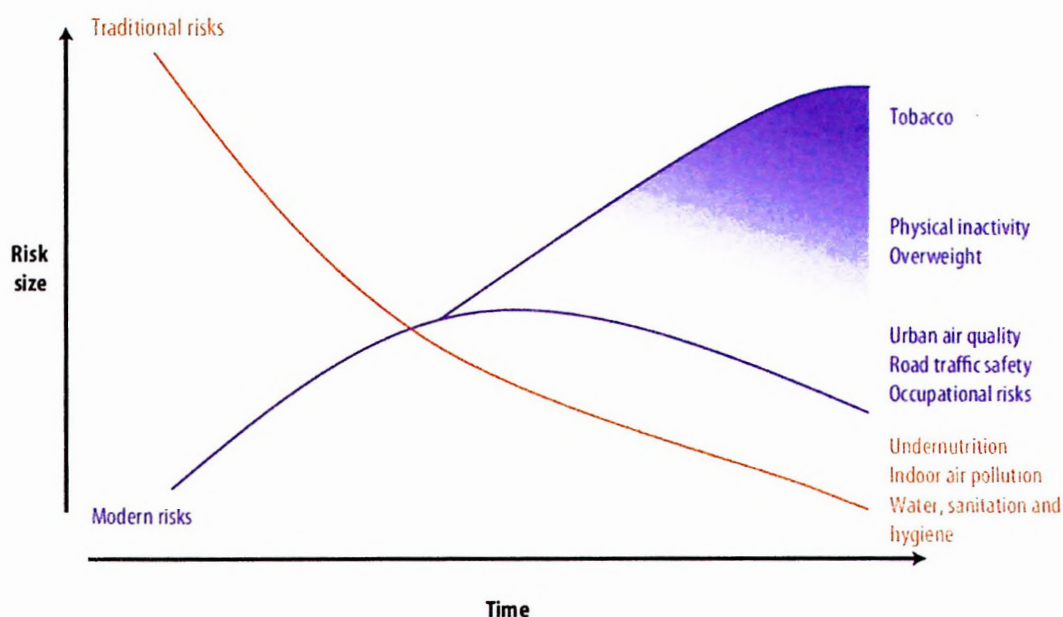


Figure 2.1 The risk transition

Source: World Health Organization Report on Global health risks, Global Burden of Disease (2009)

Health risks result in a population shift as time goes, from those for infectious disease to those that increase non-communicable disease (Figure 2.1). Families from low-income are affected the most by risks linked to poverty, like malnutrition, unprotected sex, unhygienic water, low hygiene and sanitation, and indoor smoke coming from solid fuels. These factors are rather termed “traditional risks”. As the main reason of death and disability shift to the chronic and non-communicable diseases, and as the average life expectancy increase, people are increasingly facing modern risks that arise due to a sedentary lifestyle, obesity and overweight, other factors related to diet, and tobacco and alcohol-related risks. As a consequence, a considerable amount of low- and middle-income nations are facing increasing health burden related to the modern risks while still battling against the traditional risks to health (World Health Organization, 2009b).