An Evaluative Study of the Integrated Smoking Cessation Services of Tung Wah Group of Hospitals

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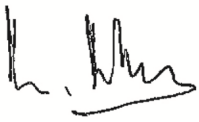
ACKNOWLEDGEMENTS

At the time when the TWGHs Integrated Centre on Smoking Cessation started its service on 1st January 2009, the available literature on smoking cessation, particularly regarding the Chinese population was limited. In order to ensure that TWGHs' smoking cessation services can effectively meet the needs of the smoking population in Hong Kong, the Board of Directors of TWGHs decided to fund the research "An Evaluative Study of the Integrated Smoking Cessation Services of Tung Wah Group of Hospitals" to examine and evaluate the effectiveness of our professional training and our integrated multi-disciplinary service model.

Today, with the completion of the research project, we are thankful to have the valuable contribution from 3 distinguished academics of the University of Hong Kong. Professor Sophia Chan Siu Chee, the principal investigator of this project, has demonstrated her remarkable leadership in conducting the research. Professor Lam Tai Hing has furnished us with his valuable advice and unfailing support throughout the research study. Dr. Doris Leung Yin Ping has committed substantial effort to the project. I would also like to extend special thanks to Dr. Henry Kong Wing Ming, Specialist in Public Health Medicine, for his clinical advice on this evaluative study. We are delighted to note from the research findings that our multi-disciplinary service approach was effective in assisting smokers to quit.

Lastly, on behalf of the Board of Directors, I would like to express our sincere gratitude to the respondents for taking part in this research project. Without their input, this research would not have been successfully completed.



(Chang Juo Hwa, Charles)
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PREFACE

Cigarette smoking is a significant cause of morbidity and mortality worldwide, yet it is the single most preventable cause of death. Due to the millions of deaths resulted from smoking and the substantial health hazards of involuntary exposure to secondhand smoke, evidently, provision of smoking cessation services is urgently needed in order to reduce the epidemic of tobacco deaths in the coming years. Nevertheless, community-based efforts to assist smokers to quit are limited in Hong Kong.

Against this background, Tung Wah Group of Hospitals collaborated with the School of Nursing and School of Public Health, The University of Hong Kong, to carry out this project entitled "An Evaluative Study of the Integrated Smoking Cessation Services of Tung Wah Group of Hospitals" which aims to evaluate this pioneer community-based services to assist smokers to quit smoking in Hong Kong.

The primary aims of this study were to build capacity for health care professionals, especially on smoking cessation and secondhand smoking, to design and deliver a smoking cessation counselling training workshop, and to equip and train smoking cessation counsellors with the appropriate knowledge and skills in smoking cessation, and finally, to evaluate the effectiveness of services of the Integrated Centre on Smoking Cessation of the Tung Wah Group of Hospitals. This project is a breakthrough in the attempt to help smokers quit in the Chinese communities. Results from the present study not only fill an important gap in the existing literature on smoking cessation but also have substantial impact on the health of the smokers, and ultimately save millions of lives and billions of health care expenditures.

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EXECUTIVE SUMMARY

Numerous research has shown that smoking is harmful to health and is the single most preventable cause of death in Hong Kong. According to the 2008 figures of the Census and Statistics Department, the smoking prevalence in Hong Kong is 11.8% and is accountable for the death of 5,700 people per year (Lam et al, 2010).

Coupled with the enactment of the Smoking (Public Health) Ordinance on 1 January 2007 and the increase of tobacco tax by 50% on 25 February 2009, the HKSAR has provided additional resources in promoting smoking cessation services since 2009, in addition to smoking cessation intervention provided by the Hospital Authority, Department of Health and the University of Hong Kong. In 2009, the Tung Wah Group of Hospitals (TWGHs) was commissioned by the Department of Health of the HKSAR Government to establish four Integrated Centres on Smoking Cessation (ICSC) in order to meet the increasing demand of smoking cessation services in the community. These ICSC were staffed by a multi-disciplinary team (including medical officers, clinical psychologist, nurse, social workers and counsellors.) to provide individual or group counselling to current smokers. A combined therapeutic approach comprising of pharmacological therapy (including nicotine replacement therapy or non nicotine replacement therapy) and counselling was rendered to smokers free of charge.

This research is conducted in two phases. In Phase 1, a capacity building training programme in smoking cessation counselling was designed and delivered to health care professionals (HCPs) of the TWGHs. Changes in Knowledge, Attitudes and Practice (KAP) in smoking cessation intervention were assessed among the trainees with a pre- post study design. Phase 2 comprised of an evaluation of effectiveness of the services of the four Integrated Centres on Smoking Cessation staffed by the trained HCPs. We assessed the smokers' smoking history at baseline, tracked the effectiveness of the intervention at 1-4, 8-12 weeks; and provided systematic telephone follow-up at 26 weeks and 52 weeks to smokers who participated in the TWGHs Integrated Centres on Smoking Cessation.

Major Findings:

(1) Our findings indicated that the trained HCPs of TWGHs showed improvement in knowledge, attitudes, and practice at 9 and 18 months after the smoking cessation training programme.

(2) The four Integrated Centres on Smoking Cessation had recruited a total of 301 smokers from 1 August 2009 to 28 February 2010, with 270 was included in the research with 41.9% and 35.9% of the smokers reported quitting smoking at 26 weeks and 52 weeks respectively.

(3) Among the continuing smokers, the proportion of subjects who had attempted to quit at least once varied across the 4 follow-ups time periods (21.9% at 1-4 weeks; 18.4% at 8-12 weeks; 38.9% at 26 weeks; and 14.5% at 52 weeks), after receiving the cessation interventions.

(4) Over half (58.6%) of the continuing smokers reported a reduction in cigarette consumption by at least half at booster intervention (1-4 weeks), and it decreased to 12.7% at the 52-weeks follow up.

(5) Results also showed that the likelihood of successful quitting at 26 weeks decreased if the subjects were single (adjusted OR=0.23, P=0.001) or married/cohabiting (adjusted OR=0.37, P=0.014) compared to those who were separated/divorced/widowed, and felt depressed (adjusted OR=0.15, P=0.006) or very depressed (adjusted OR=0.53, P=0.020) compared to those who were not depressed. Further investigations to examine the correlations among the psychosocial variables of these sub-groups are warranted.

(6) Quitters at 26 weeks had significant increase in their self-efficacy scores to resist smoking due to both internal and external stimuli, and perceived importance of and confidence in stop smoking after receiving the smoking cessation intervention.

This project has built capacity among a group of multi-disciplinary HCPs and the findings have demonstrated that providing smoking cessation training to HCPs has not only increased their level of KAP, but also their confidence in conducting smoking cessation counselling. The research findings also indicated that the community-based integrated cessation model with a combination of pharmacotherapy and counselling is effective in helping smokers quit smoking and improve their smoking behaviour. This multi-disciplinary model can serve as a benchmark for further development of smoking cessation services in the Chinese community.

1 INTRODUCTION

Smoking is the single preventable cause of deaths in Hong Kong. It was estimated that smoking accounts for about one fifth of all deaths and kills about 5,700 people per year (Lam et al., 2001). The smoking prevalence was about 11.8% (20.5% in males and 3.6% in females) in 2008 (Census & Statistics Department, 2008). Smoking has been associated with serious damage to health at all ages, leading to cancers, heart diseases, stroke, chronic lung diseases, and many other health problems. It was estimated in 1998 that US$688 million in medical cost were attributed to smoking-related diseases annually, with active smoking accounted for 77% and passive smoking 23% of the total cost (McGhee et al., 2006).

Smoking cessation services in Hong Kong were mainly provided by the Hospital Authority, Department of Health and the University of Hong Kong before 2009. Some private doctors and private hospitals also provide smoking cessation services. Prior to 2009, almost all of the smokers (97.9%) did not access smoking cessation services, even though around 60% were aware of the services (Census & Statistics Department, 2008). The Tung Wah Group of Hospitals (TWGHs) was the first non-governmental organization commissioned by HKSAR government to run a community-based smoking cessation services since 2009. With the implementation of the Smoking (Public Health) Ordinance on 1 January 2007 and the increase of tobacco tax by 50% on 25 February 2009, it is anticipating that more smokers would be motivated to quit smoking. With the increased awareness of detrimental effects of smoking and the call for smoking cessation programme in the community, there is a need to explore and evaluate existing efforts further development of effective interventions in smoking cessation.

We adopted the stage of change theory (DiClemente et al., 1991) using motivational interviewing techniques combined with pharmacological treatment (both nicotine replacement therapy and non-nicotine replacement therapy) as this model was shown to be an effective and safe method to help clients quit smoking world-wide as well as in Hong Kong (Abdullah et al., 2004; Lam et al., 2005; Fiore et al., 2008). The present study aimed to (1) provide and evaluate relevant smoking cessation training for HCPs, and (2) evaluate the effectiveness of four Integrated Centres on Smoking Cessation in providing Chinese smokers an avenue to access smoking cessation services in the community.

2 OBJECTIVES

The specific goals of the project were:

(1) To build capacity among the health care professionals in providing support for smoking cessation and second-hand smoking;

(2) To design and deliver a smoking cessation counselling training prgramme for smoking cessation counsellors and equip them with knowledge and skills in smoking cessation; and

(3) To evaluate the effectiveness of the services provided in the community-based Integrated Centre on Smoking Cessation of the Tung Wah Group of Hospitals, Hong Kong.

3 METHODOLOGY

The project had 2 phases. In Phase 1, the research team designed and implemented capacity building programmes in smoking cessation counselling for a group of health care professionals in Tung Wah Group of Hospitals, who were expected to lead the development of smoking cessation efforts to help smokers quit. In Phase 2, the effectiveness of services provided in the four Integrated Centres on Smoking Cessation was evaluated.

3.1 Design and Methods

In Phase 1, a longitudinal follow up study to examine the impact of the training programme on the participants was conducted.

In Phase 2, individualized smoking cessation interventions on changing the smoking behaviour of the smokers provided by TWGHs were evaluated. The intervention consisted of at least four sessions (initial contact, one to two booster interventions at 1-4 weeks, and one to two post-interventions at 8-12 weeks) were rendered based on the needs of individual smokers. Smokers were motivated during the intervention process through a) identifying of their strengths and barriers in the quitting process, b) providing appropriate advice on bio-psycho and social issues related to smoking, and c) enhancing their self-efficacy to resist smoking. Smokers were followed up at 26 weeks and 52 weeks to assess their smoking status and other related variables.

3.2 Main outcome measures

3.2.1 Phase 1

The two outcome measures in Phase 1 were assessed through a standardized questionnaire. The outcomes included (a) the design and delivery of a training programme for 30 HCPs in TWGHs, and their success in obtaining the qualification of Smoking Cessation Counsellors (SCCs), and (b) the changes in their Knowledge, Attitudes, and Practice in smoking cessation (KAP) at baseline, at 9 months and at 18 months after the training programme.

3.2.2 Phase 2

The primary outcome measure in Phase 2 was the 7-day point prevalence quit rate of smokers at 26 weeks based on intention to treat analysis (a standard but conservative approach, assuming those who were not followed up or with missing information had not quitted or

reduced smoking). The secondary outcomes included (a) self-reported 7-day quit rates at post-intervention (8-12 weeks) and 52 weeks; (b) proportion who attempted to quit at 26 weeks; (c) proportion to reduce daily cigarette consumption by at least half at 26 weeks, and (d) biochemical validated quit rate at 26 weeks and 52 weeks. In addition, we also examined the changes in six psychological factors: (a) self-efficacy to refrain from smoking due to internal and external stimuli, (b) importance of successful quitting, (c) confidence in not smoking again, (d) difficulty in quitting, (e) perceived stress in the quitting process, and (f) Decisional Balance Inventory from baseline to 52 weeks, baseline predictors of successful quitting at 26 weeks, associations of psychosocial variables and smoking status at 26 weeks, as well as clients' satisfaction with the cessation service reported at 8-12 weeks.

3.3 Data analysis

In Phase 1, repeated measure ANOVAs were performed to examine the overall changes in the counsellors' knowledge, attitudes and practice of smoking cessation over time and Turkey post-hoc tests were used for pair-wise comparisons across the 3 time points.

In Phase 2, descriptive statistics of means, frequencies and percentages were used to summarize the baseline characteristics of the smokers receiving smoking cessation intervention, pharmacological therapy usages and withdrawal symptoms at the booster and post-intervention, and the primary outcome of quit rate and the three secondary outcomes of smoking related variables at 26 weeks and 52 weeks. Repeated measure ANVOAs were used to test for changes in the six psychosocial factors over the study time from baseline to 52 weeks. Bivariate and multivariate analyses were performed to identify baseline predictors of successful quitting at 26 weeks. In the bivariate analyses, the t-test was used to compare continuous variables whereas the chi-square test was used for categorical variables. Factors that were found to be associated with successful quitting at 26 weeks in the bivariate analyses with a p-value < 0.2 were included in the multivariate logistic regression model. Backward elimination with Wald tests was used in the multivariate analysis to identify independent predictors of successful quitting at 26 weeks. Independent t-tests were used to compare the mean score differences in the changes in the six psychosocial variables from baseline to 26 weeks between self-reported quitters and non-quitters at 26 weeks. The level of significance was taken as 5% and all estimated effects were accompanied by 95% confidence intervals, where appropriate. All analyses were performed by SPSS version 18.0.

3.4 Ethical consideration

Approval from the University of Hong Kong and the Hong Kong West Cluster of Hospital Authority Institutional Review Board (UW 09-320) was obtained. Written consents were gathered from participants in the two phases. In Phase 2, clients were free to withdraw from the smoking cessation programme at any time without penalty and their medical treatment, if any, would not be affected. The participants were assured that the data collected were kept confidential and the results would be reported in an aggregate format.

3.5 Procedures

3.5.1 Phase 1: Implement and Evaluate a Smoking Cessation Training Programme

Development of the Smoking Cessation Counselling Training Programme

The training programme was designed based on an established training programme in Hong Kong (Chan et al., 2001), adopting the principles of the US Agency for Health Care Policy and Research (AHCPR) clinical practice guidelines (Fiore et al., 2000), with culturally specific modifications for Chinese smokers. The teaching and learning strategies included lectures, small groups, video shows, and case discussions. After the training, all trainees took a written examination in multiple choice format and a practical examination in which they had to conduct a counselling session based on a case scenario with a simulated smoker. On passing both examinations, the trainees were awarded a Certificate of Achievement as qualified Smoking Cessation Counsellors (SCCs) by the University of Hong Kong.

Implementation of the Smoking Cessation Training Programme

A total of one basic and two advanced training workshops for health care professionals were conducted during the study period.

Basic Training Workshop: The two-day smoking cessation training workshop was delivered by the research team to a total of 50 health care professionals (39 social workers, 5 doctors, 1 clinical psychologist, 1 nurse and 4 programme workers) of TWGHs on 7 and 14 January, 2009. All except one participant completed the 2-day training workshop and took the written examination on 31 January 2009 and the practical examination on 2 February 2009. 30 participants passed both examinations and were awarded a Certificate of Achievement as qualified Smoking Cessation Counsellors by the School of Nursing and School of Public Health of the University of Hong Kong.

Advanced Training I: Department of Health

A booster training workshop was delivered by medical officers and registered nurse on the local smoking epidemic, smoking cessation resources in the community, application on pharmacotherapy and motivational interview technique in smoking cessation to Smoking Cessation Counsellors (SCCs) of TWGHs Integrated Centre on Smoking Cessation on 15 January 2009.

Advanced Training II: Mayo Clinic

Senior staff of TWGHs Integrated Centre on Smoking Cessation (including one medical officer, one senior counsellor, one clinical psychologist and one social worker) attended a 5-day Certified Tobacco Treatment Specialist Training organized by Mayo Clinic, Rochester, United States from 24 to 28, August 2009. All of them passed the two written examinations and were accredited as Certified Tobacco Treatment Specialist by Mayo Clinic, United States.

Effectiveness of the Training Workshop

Trainees who participated in and completed the 2-day training workshop were asked to complete the KAP questionnaires at baseline, 9 months and 18 months after the training to assess their changes in knowledge, attitudes and practice of tobacco control and smoking cessation. Adopted from a previous study with nurses and social workers in Hong Kong (Johnston et al., 2004; Chan et al, 2007; Leung et al., 2009), the KAP questionnaire consists of 135 items measuring seven aspects: (1) General knowledge on smoking cessation and tobacco (13 items) and specific knowledge about smoking related diseases (18 items); (2) Learning needs of professional training (14 items); (3) Attitudes about smoking and tobacco control and perceptions of their roles in helping patients stop smoking (13 items); (4) Frequency of providing practice on smoking cessation, confidence and competence in providing such practice (19 items); (5) Competence in delivering smoking cessation intervention (14 items); (6) Facilitators (14 items) and barriers to practice (15 items); and (7) Demographic data (15 items). Among the 49 participants, 30 of them (61.2%) completed and returned the KAP questionnaire before the training workshop. 22 of the 30 participants (73.3%) completed and returned the KAP questionnaires at 9 and 18 months.

3.5.2 Phase 2: Integrated Centre on Smoking Cessation in Hong Kong

Establishment of Integrated Centre on Smoking Cessation (ICSC)

Four Integrated Centres on Smoking Cessation of TWGHs were set up in January 2009 to provide free individual or group smoking cessation services to smokers in the community. A total of 11 opening sessions were offered by each centre with 2 evening and 2 weekend sessions. Subjects were recruited via the hotline of Department of Health (1833- 183) and community outreaching programms by TWGHs, and by self and external referrals. The inclusion criteria for the service were : (1) current smokers who visited either one of the 4 Integrated Centres on Smoking Cessation of TWGHs; (2) Hong Kong residents aged 18 or above; (3) Cantonese speaking; (4) smoked at least one cigarette per day; and (5) stayed in Hong Kong during the intervention period (8 weeks). Current smokers who were (1) psychologically or physically unable to communicate; (2) currently enrolled in other smoking cessation programmes, (3) at the active phase of diagnosed psychiatric illness, or (4) discharged from the hospital with history of cardiovascular diseases such as stroke, ischemic heart disease within 2 weeks prior to receiving smoking cessation services were excluded.

A flowchart of the study is shown in Appendix A. After screening for eligibility, our smoking cessation counsellors assessed the clients' smoking status, abstinence history, and stages of readiness to change through a standardized questionnaire and measurement of exhaled carbon monoxide level at baseline. The standardized questionnaire assessed information on psychosocial variables including scales to measure self-efficacy to resist smoking, Decisional Balance Inventory and perceived stress which had been validated among Chinese smokers (Leung, Chan, Lau et al. 2008, Leung, Chan, Mak et al. 2008, Leung et al., 2010). Relevant and stage-matched interventions were then provided to the clients and health hazards of smoking and benefits of quitting were highlighted. Counsellors or physicians discussed the use of nicotine replacement therapy (gum/patch/inhaler) or non-nicotine replacement therapy (Bupropion/Varenicline) with the smokers and subsequently prescribed the appropriate pharmacotherapy. Within 1-4 weeks after the initial contact, smoking cessation counsellors met the smokers again (booster counselling) to assess their smoking status and provide further face-to-face cessation counselling. In case the client was not available to visit our centre, the booster counselling was delivered via telephone. Additional smoking cessation counselling sessions (either in the form of individual or group counselling) were also provided within 8 weeks after the first contact to enhance smokers' self-efficacy to refrain from smoking. After 8 to 12 weeks of the first contact, the counsellors met the clients again to assess their smoking status and understand their quitting process. For clients who reported smoking abstinence, relapse prevention intervention such as support group, sharing sessions with quitters and social activities were delivered. For those who continued to smoke,

further smoking cessation counselling and pharmacotherapy were provided if necessary.

Two telephone follow-up calls were made by the smoking cessation counsellors at 26 and 52 weeks respectively to assess their smoking status, quitting history and smoking-related psychosocial factors. At both 26 and 52 weeks, we invited those who had stopped smoking in the past 7 days to participate in a biochemical validation including exhaled carbon monoxide measurement and saliva cotinine test at the centers. Further social club gathering and telephone counselling were provided to the clients between 26 and 52 weeks if needed.

Publicity of the Smoking Cessation Service

A series of promotional strategies were launched since the inauguration of the ICSC (Table 1). Strategies included designing specific pamphlets and posters which were distributed to smokers; promotional letters sent to kindergartens, primary and secondary schools; a press conference held to launch the services commencement of the ICSC; referral letters sent to governmental departments, non-governmental organizations, members of district councils, private physicians, primary and secondary schools; promotional articles published in the Newsletters of TWGHs and Bulletin of Department of Health, and interviews by mass media. In addition, the service could also be accessed through a single telephone number (1833-183 press "2") provided and publicized by Department of Health. Announcement of Public Interest (API) in TV/radios released from Tobacco Control Office of Department of Health and Hong Kong Council on Smoking and Health was also arranged.

Table 1. List of Publicity of the Integrated Centre on Smoking Cessation in 2009

Date	Publicity Strategies	Details
Jan 09	Promotional letter	Sent to 935 kindergartens, 559 primary and 465 secondary schools, 299 parents-teachers associations (both primary & secondary schools), 145 maternity clinics, 50 medical social work services units, 981 private physicians and 347 dentists, non-governmental organization and government departments.
Feb 09	Invitation letter	Sent to primary and secondary schools , non-governmental organization, government departments, members of district councils in Yau Tsim Mong, Tuen Mun, Shatin and Wan Chai Districts
7 Feb 09	Press Conference	A launching ceremony of the Integrated Centre on Smoking Cessation
	Promotional articles	Published in Newsletters of TWGHs and Bulletin of Department of Health 東華通訊 2009 年 2 月號 戒煙綜合服務開展禮 2009 年 6 月號 5.31 世界無煙日 TCO 專訊 17 期及 18 期
	Interviews by mass media	Interviews by radios and televisions 2009 年 3 月 4 日至 4 月 17 日 新城電台 集知新世代-戒煙系列(共 10 集) 2009 年 3 月 24 日 Now TV 新聞台時事全方位 2009 年 8 月 11 日 TVB Pearl News
Reported by mass media		
Date	Newspaper	Topic
8 Feb 09	太陽報	東華三院免費助戒煙
	東方日報	東華戒煙服務中心啓用
9 Feb 09	成報	東華三院一站式綜合戒煙
	大公報	家人參與戒煙更見效
27 Feb 09	經濟日報	戒煙查詢升 6 倍「料年省 2 萬」
28 Feb 09	明報	周一嶽：不排除全港禁煙 大加煙稅料 10 萬人戒煙
	成報	戒煙熱線用量大增 8 倍
	星島日報	周一嶽：煙民不減或禁煙 「兒童煙民」逾萬青少年煙癮日增
	文匯報	本港 10 歲以下煙民逾萬 煙民不減或再加稅戒煙熱線接電話增 29 倍
	新報	戒煙熱線增 6.5 倍
	經濟日報	逾萬小煙民 10 歲前已抽煙 周一嶽冀減兩成煙民否則擬再加稅
29 Feb 09	香港商報	周一嶽：加煙稅望減小煙民
3 Mar 09	經濟日報	抽煙因情緒困擾女性戒煙難
24 Mar 09	蘋果日報	東華三院獲資助辦戒煙服務
3 Jul 09	成報	心理輔導治療心癮

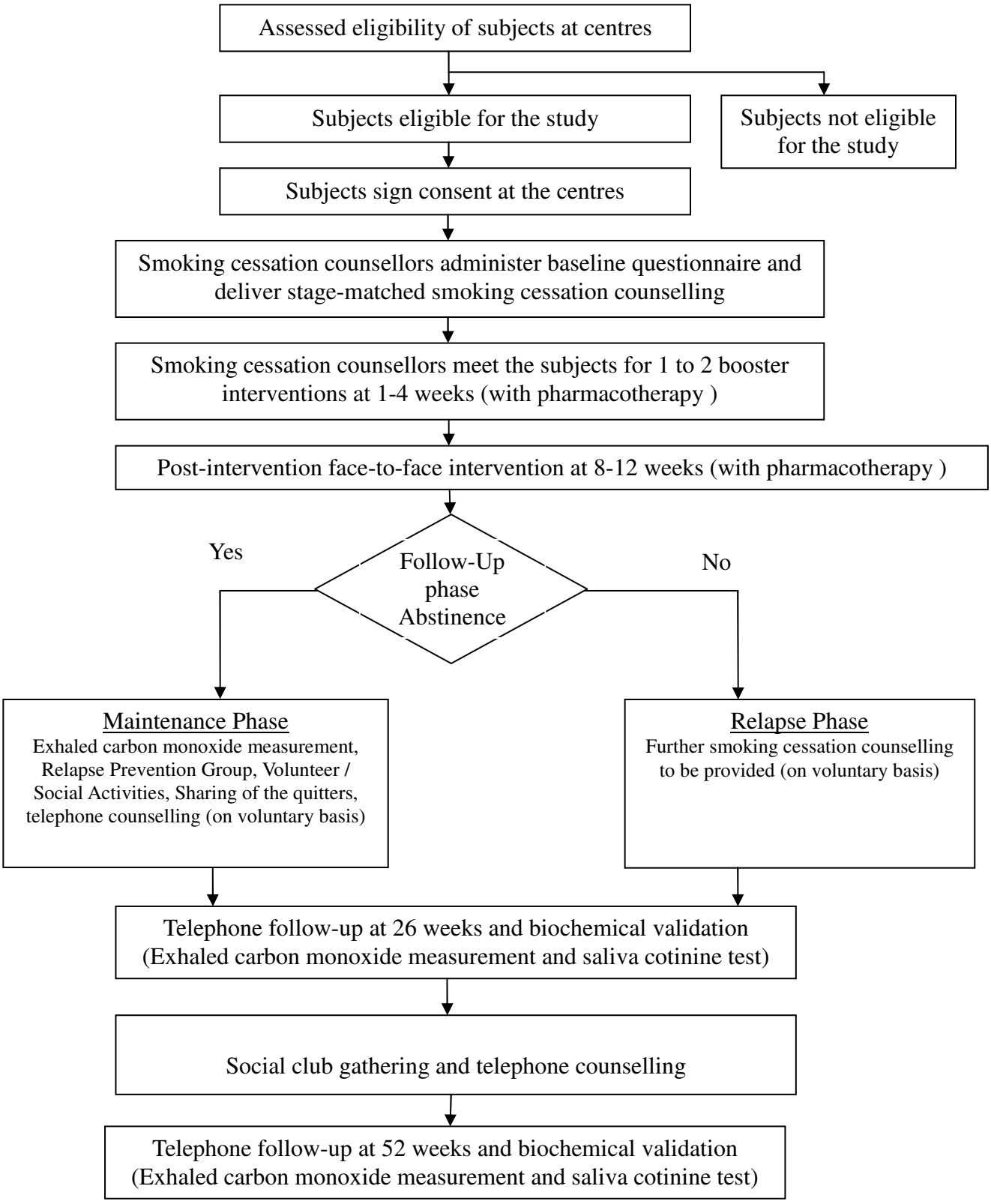
Quality Assurance of Counselling Sessions

A quality assurance mechanism was established to ensure the quality of the counselling sessions provided by the smoking cessation counsellors and the operation of the ICSC. It included the utilization rate of the centre, quit-rate, counselling interventions (contents and counselling skills), rate of successful follow-up, as well as general record-keeping standard. The quality of counselling interventions was monitored by an experienced and senior smoking cessation counsellor. Counselling sessions from the counsellors were randomly selected at different times and were reviewed by the senior smoking cessation counsellor. The content and skills of the counselling interview were assessed. Feedback was provided to the counsellors to ensure counselling standards were adhered to. Monthly clinical case meetings with all smoking cessation counsellors, clinical psychologist and physicians were held to share clinical experience and discuss difficult cases.

Satisfaction Survey

A satisfaction survey was included in the post-intervention follow up questionnaire at 8-12 weeks to assess the clients' level of satisfaction about the smoking cessation services on completion of at least four intervention sessions.

Appendix A. Study Protocol



4 FINDINGS

4.1 Phase 1: Evaluation of Smoking Cessation Counselling Training Programme

4.1.1 General program evaluation

A total of 50 health care professionals in TWGHs received the training on smoking cessation counselling. 30 of them were awarded as qualified Smoking Cessation Counsellors (SCCs). The participants completed an anonymous evaluation of the workshop immediately after the training. Overall, the participants provided positive feedback about the programme. 83.7% of the participants opined that the overall programme objective was met (with rating as 'good' or 'excellent'). The programme had successfully prepared and equipped participants with knowledge on the theories of tobacco dependency and smoking cessation, and participants have acquired competence in delivering appropriate counselling interventions. Table 2 reports results on the general programme evaluation.

Table 2. General programme evaluation of the training workshop

Elements for evaluation		**Unsatisfactory (1)**		**Needs Improvement (2)**		**Average (3)**		**Good (4)**		**Excellent (5)**		**Mean**	**SD**
		n	(%)	n	(%)	n	(%)	n	(%)	n	(%)		
1	Programme Organization	0	(0.0)	0	(0.0)	11	(22.4)	34	(69.4)	4	(8.2)	3.86	0.54
2	Variety of session topics offered	0	(0.0)	1	(2.0)	6	(12.2)	38	(77.6)	4	(8.2)	3.92	0.53
3	The audiovisuals used	0	(0.0)	1	(2.0)	11	(22.4)	36	(73.5)	1	(2.0)	3.76	0.52
4	Total course content	0	(0.0)	0	(0.0)	8	(16.3)	36	(73.5)	5	(10.5)	3.94	0.52
5	Adequate opportunity for discussion, comments, questions and answer interchange	0	(0.0)	3	(6.1)	24	(49.0)	20	(40.8)	1	(2.0)	3.40	0.64
6	Appropriate course length	0	(0.0)	2	(4.1)	21	(42.9)	25	(51.0)	1	(2.0)	3.51	0.62
	Overall rating	**0**	**(0.0)**	**0**	**(0.0)**	**8**	**(16.3)**	**39**	**(79.6)**	**2**	**(4.1)**	**3.88**	**0.44**

4.1.2 Pre, 9 and 18 months post training KAP survey

One pre- and two post-training KAP surveys at 9 and 18 months were conducted to assess the effectiveness of the training programme. 30 participants in the training programme completed the pre-training KAP questionnaire. 22 qualified Smoking Cessation Counsellors (SCCs) completed the questionnaires at both 9 and 18 months in November 2009 and August 2010 respectively. Results showed significant increase in the mean scores of (1) knowledge relating to smoking cessation and the impact of smoking on health, (2) attitudes towards tobacco promotion and smoking cessation counselling, and (3) practice in the 5As smoking cessation strategies at 9 months. The 18 months mean scores for knowledge, attitudes, and practice of 5As dropped slightly when compared to the 9-month follow-up, but were still significantly higher than the baseline scores (Table 3). These results were encouraging that the KAP of the 22 trained health care professionals had improved overtime after the SCC training, and a critical mass who formed in delivering smoking cessation intervention in TWGHs.

Table 3. Comparison of mean scores in Knowledge, Attitudes and Practice of Smoking Cessation Counsellors at baseline, 9-month and 18-month follow ups (n=22)

	Baseline (1)		9 months (2)		18 months (3)		P-value (Overall F test)	P-value (Turkey Post-hoc tests)
	Mean	SD	Mean	SD	Mean	SD		
General Knowledge: Mean No. of correct response to general knowledge (out of 13)	9.32	1.94	11.05	1.17	10.05	1.25	***p=0.001***	1 vs 2, ***0.001*** 1 vs 3, 0.23 2 vs 3, **<0.001**
Specific Knowledge: Mean No. of correct response to specific knowledge (out of 18)	11.91	3.41	14.23	1.15	14.09	1.02	***p=0.002***	1 vs 2, ***0.006*** 1 vs 3, ***0.010*** 2 vs 3, 0.56
Attitudes towards tobacco control and smoking cessation[1*]	1.83	0.34	1.59	0.29	1.57	0.33	***p*=0.001**	1 vs 2, ***0.004*** 1 vs 3, ***0.004*** 2 vs 3, 1.00

Table 3 (con't)

Practice of smoking cessation counselling[2*]								
Ask (1-4)*	3.57	0.66	2.31	0.91	2.36	0.92	***p<0.001***	1 vs 2, ***0.001*** 1 vs 3, ***0.001*** 2 vs 3, 0.99
Advice (1-4)*	3.25	0.86	2.06	0.73	2.11	0.76	***p<0.001***	1 vs 2, ***0.001*** 1 vs 3, ***0.001*** 2 vs 3, 0.99
Assess (1-4)*	3.33	0.81	2.40	0.94	2.45	0.95	***p=0.004***	1 vs 2, ***0.011*** 1 vs 3, ***0.014*** 2 vs 3, ***0.99***
Assist (1-4)*	3.66	0.54	2.75	0.68	2.76	0.72	***p=0.003***	1 vs 2, ***0.002*** 1 vs 3, ***0.002*** 2 vs 3, ***1.00***
Arrange (1-4)*	3.79	0.48	2.63	1.04	2.56	1.01	***p<0.001***	1 vs 2, ***0.002*** 1 vs 3, ***0.001*** 2 vs 3, 1.00
Overall Practice: 5A*	3.52	0.59	2.43	0.79	2.45	0.82	***p<0.001***	1 vs 2, ***0.001*** 1 vs 3, ***0.001*** 2 vs 3, 1.00
Competence[3*] (1-4) ***(n=17)***	2.45	0.62	1.96	0.36	1.98	0.38	***p=0.002***	1 vs 2, ***0.008*** 1 vs 3, ***0.007*** 2 vs 3, 1.00

Note [1]: 1 = Strongly agree, 2 = Agree, 3 = Disagree, 4 = Strongly disagree
Note [2]: 1 = Frequently, 2 = Occasionally, 3 = Seldom, 4 = Never
Note [3]: 1 = Very able, 2 = Able, 3 = Not able, 4 = Very not able
*: The lower the score the better the results due to the scoring of the scale

4.2 Phase 2: Evaluation of the Integrated Centre on Smoking Cessation

4.2.1 Subject recruitment to the Integrated Centre on Smoking Cessation

From 1 August 2009 to 28 February 2010, a total of 301 smokers were recruited from the four Integrated Centres on Smoking Cessation of TWGHs to receive our smoking cessation interventions. 31 of them were excluded from the current analysis because either they had completed the old version of research questionnaire or did not complete the questionnaire at baseline. Data from 270 smokers were thus included in the current analysis.

Retention Rate

Out of 270 clients who completed baseline counselling, 88% (238/270) were contacted and received the booster telephone counselling between 1 - 4 weeks and 77% (208/270) received the post-intervention counselling between 8 - 12 weeks. The follow up response rates at 26 and 52 weeks were 79% (214/270) and 70% (190/270) respectively (Table 4). The main reasons for unsuccessful contacts were (1) unable to reach the clients by telephone and (2) the clients refused to participate during follow up.

Table 4. Retention rate of the study

	Follow up				
	Baseline (1 Aug 09 – 28 Feb 10)	Booster Intervention (1-4 weeks)	Post Intervention (8-12 weeks)	26-weeks follow up	52-weeks follow up
Number of eligible cases	270	270	270	270	270
No. of successful follow up	n.a.	238	208	214	190
Retention (%)	n.a.	88.1	77.0	79.3	70.4

4.2.2 Baseline characteristics of smokers who attended the four Integrated Centres on Smoking Cessation (n=270)

Baseline demographics

Among the 270 clients, 73.7% were male, with a mean age of 42 years. 62.6% of them were married or cohabiting, and 57.4% of the subjects had completed Form 4 education , 16.3% with tertiary education level or above, 64.8% of them had a job currently (Table 5). Most of the subjects reported to have poor or very poor health (71.1%), felt tense or very tense (70.4%) or felt depressed or very depressed (68.2%).

Table 5. Baseline demographic characteristics of the subjects (N=270)

	N (%)
Age in years	
15 to 19	3 (1.1)
20 to 29	45 (16.7)
30 to 39	87 (32.2)
40 to 49	59 (21.9)
50 to 59	43 (15.9)
≥60	33 (12.2)
Gender	
-Male	199 (73.7)
-Female	71 (26.3)
Marital status	
-Single	68 (25.2)
-Married / Cohabited	169 (62.6)
-Separated / Divorced / Widow	33 (12.2)

Table 5. (con't)

	N (%)
Education	
-Primary school or below	35 (13.0)
-Form 1 to Form 3	80 (29.6)
-Form 4 to Form 7	111 (41.1)
-Post secondary or tertiary	44 (16.3)
Employment status	
-Not in workforce	44 (16.3)
-Full-time Student	6 (2.2)
-Employed	175 (64.8)
-Unemployed / Retired	45 (16.7)
Monthly household income (HKD) (Missing =1)	
-Under 10,000	84 (31.1)
-10,000 – 19,999	102 (37.8)
-20,000 – 29,999	43 (15.9)
-30,000 or above	40 (14.8)
Living district	
-Hong Kong Island	38 (14.1)
-Kowloon	80 (29.6)
-New Territories and outlying islands	147 (54.4)
Perceived health[1]	
-Very poor	23 (8.5)
-Poor	169 (62.6)
-Good	70 (25.9)
Felt tense[1]	
-Very tense	28 (10.4)
-Tense	162 (60.0)
-Not tense	80 (29.6)
Felt depressed[1]	
-Very depressed	18 (6.7)
-Depressed	166 (61.5)
-Not depressed	86 (31.9)

[1] *Self-reported variable*

Smoking profile

On average, the clients had a smoking history of 23.2 years (SD=13.1) and over half of them (52.6%) smoked 11-20 cigarettes per day. The Fagerström score showed that over half (54.4%) of the subjects had high dependency to nicotine. The four situations that smokers reported they were most tempted to smoke included: 1) after meal (78.5%); 2) boring or to kill time (73.0%), 3) at home (70.4%) and 4) after wake up (66.3%). Around half of the clients did not have a drinking habit (47.8%). For those who drank, most subjects claimed to smoke more after drinking (34.8%) (Table 6).

Table 6. Baseline smoking profiles and drinking habit of the subjects (N=270)

	Mean (SD)
Years of smoking	23.2 (13.2)
	N (%)
Daily cigarette consumption	
-Less than 10	51 (18.9)
-11 – 20	142 (52.6)
-21 – 30	55 (20.4)
-More than 30	22 (8.1)
Fagerström Test for Nicotine Dependence	
-Low (Score 0-3)	54 (20.0)
-Medium (Score 4-5)	69 (25.6)
-High (Score 6-10)	147 (54.4)
Situations that smoked most	
-After meal	212 (78.5)
-Boring/kill time	197 (73.0)
-At home	190 (70.4)
-After wake up	179 (66.3)
-Feel tense	165 (61.1)
-Feeling relax	154 (56.7)
-Smokers around	151 (55.9)
-When toilet	133 (49.3)
-With Friends	129 (47.8)
-At workplace	115 (42.6)
-Drinking alcohol	112 (41.5)
-Want to concentrate	98 (36.3)
-Children not around	47 (18.2)
-Bathing	13 (4.8)
Drinking habit	
-Not drink	129 (47.8)
-Less than once a month	54 (20.0)
-1-3 per month	34 (12.6)
-4-6 per month	18 (6.7)
-1-3 per week	18 (6.7)
Every day	16 (5.9)
Smoke more after drinking	
-More	94 (34.8)
- Less	6 (2.2)
-No difference	41 (15.2)
-Not applicable	129 (47.8)

Health Information

Over half (56.3%) of the subjects consulted doctors in the past 6 months; in which 38.2% of them visited doctors for three times or more and around two-thirds (68.4%) of them were advised by health care professionals to quit smoking. Most of the clients reported not to have chronic illness (75.6%) or mental illness (87.0%). The two popular ways of knowing about smoking cessation services of TWGHs Integrated Centre on Smoking Cessation were through the media (33.3%) and government hospitals or clinics (27.4%) (Table 7).

Table 7. Baseline health related information of the subjects in the past six months (N=270)

	N (%)
See a doctor in the past 6 months	
-Yes	152 (56.3)
-No	118 (43.7)
Number of visits (N=152)	
- Once	55 (36.2)
- Twice	39 (25.7)
- Three times	24 (15.8)
- More than three times	34 (22.4)
Smoking cessation advice given (N=152)	
-No smoking cessation advice	48 (31.6)
-Advised by healthcare professionals	104 (68.4)
Reported having chronic illness (N=270)	
-Yes	66 (24.4)
-No	204 (75.6)
Reported having mental illness (N=270)	
-Yes	35 (13.0)
-No	235 (87.0)
Means of knowing smoking cessation services of TWGHs Integrated Centre on Smoking Cessation (N=270)	
-Media (website, radio, newspaper)	90 (33.3)
-Government hospital/clinics	74 (27.4)
-Friends	37 (13.7)
-Other sources (leaflets, posters)	37 (13.7)
-Relatives	24 (8.9)
-NGO	12 (4.4)

Quitting history

Most (74.8%) of the subjects had tried to quit smoking for more than 24 hours in the past. Over 60% of them had tried more than once, 5% of them even attempted to quit more than 6 times. Around a third of them attempted to quit within the past 6 months and 68.3% did not maintain abstinence more than a month. Furthermore, the most popular way to quit smoking was by using their own will (61.4%), followed by using NRT (30.7%). The three reasons cited for relapse were: desire of smoking (44.6%), smokers around (43.1%) and boredom (28.7%) (Table 8).

Table 8. History of quitting smoking and intention to quit at baseline (N=270)

	N (%)
Tried to reduce the daily cigarette consumption in the past 30 days	160 (59.3)
Tried to quit smoking before (at least 24 hours)	202 (74.8)
Number of quit attempts (N=202)	
-Tried once	76 (37.6)
-2 to 5 times	115 (56.9)
-6 to 10 times	8 (4.0)
-More than 10 times	3 (1.5)
Time of last quit attempts (N=202)	
-Within 1 month	26 (12.9)
-1 month to 6 months	41(20.3)
-7 months to 12 months	16 (7.9)
-More than 12 months	119 (59.0)
Period that can go without smoking (N=202)	
-Less than 1 day	33 (16.3)
-1 day to 30 days	105 (52.0)
-1 months to 6 months	38 (18.8)
-6 months to 12 months	10 (5.0)
-More than 12 months	16 (7.9)
Methods of quitting used in the last attempt (N=202)	
-Own will	124 (61.4)
-NRT	62 (30.7)
-Self-help material	15 (7.4)
-Group counselling	13 (7.4)
-Individual counselling	5 (2.5)
-Non-NRT	5 (2.5)
-Chinese medicine	2 (1.0)
-Ear acupuncture	1 (0.5)
-Hypnosis	0 (0.0)
Three most cited reasons for relapse (N=202)	
-Desire to smoke	88 (44.6)
-Smokers around	87 (43.1)
-Boredom	58 (28.7)

Intention to quit

51.1% of the clients were in the preparation stage and 39.3% in the action stage. Majority of the subjects wanted to quit because they wanted a healthy life (80.5%), followed by saving money (43.4%) and people around hate them smoking (31.4%) (Table 9).

Table 9. Intention to quit and reasons of quitting at baseline (N=270)

Intention to quit smoking	N (%)
Stage of readiness to quit smoking (N=270)	
-Action stage	106 (39.3)
-Preparation stage	138 (51.1)
-Contemplation stage	3 (1.1)
-Pre-contemplation stage	23 (8.5)
Reasons of quitting smoking[1] (N=159)	
-Want to have a healthy life	128 (80.5)
-Save money	69 (43.4)
-People around hate s/he smoking	50 (31.4)
-Improve the appearance and the smell of cigarettes	43 (27.0)
-Understand smoking causes disease	41 (25.8)
-Prove that s/he is capable to quit smoking	37 (23.3)
-Want to have a sense of control of life	35 (22.0)
-Someone requested s/he to quit	30 (18.9)
-Avoid conflicts with family	21 (13.2)
-Avoid causing inconvenience at school/work place	15 (9.4)
-Discriminated by others	11(6.9)
-Join sport programs	10 (6.3)
-Want to improve appetite or increase weight	7 (4.4)

[1] Multiple selections were allowed

Psychosocial factors related to smoking

Results of levels of six psychosocial factors related to smoking of the clients at baseline are presented in Table 10. In a scale of 0 (not confident at all) to 100 (most confident), the mean score of confidence to quit smoking was 67.0 (SD=21.4). The participants perceived that quitting smoking was very important (mean=86.1, SD=15.4 in a scale of 0-100) and they encountered moderate to severe difficulty in quitting smoking (mean=77.0, SD=20.2, in a

scale of 0-100). The three most frequently reported difficult situations in quitting smoking were: 1) dealing with withdrawal symptoms (59.6%); 2) smokers around (43.4%) and 3) getting pressure from work, personal relationship and financial (43.0%). Many subjects expressed that their spouse (55.9%) and their children (33.7%) would support them if they quit smoking.

Self-efficacy in resisting smoking was measured by the Chinese version of the Smoking Self-efficacy Questionnaire which consists of 2 subscales, internal stimuli and external stimuli, on a 5-point Likert scale (1 = 'definitely not sure, to 5 = 'definitely sure'). The internal stimuli subscale includes intrapersonal and physiological factors while the external stimuli subscale includes social factors. The mean scores were 2.53 for the internal stimuli subscale and 2.82 for the external stimuli subscale at baseline, which indicated that our smokers who attended the clinic had low self efficacy to refrain from smoking at the beginning.

Decisional balance regarding smoking was measured by the 6-item version of Decisional Balance Inventory which consists of 2 subscales, each of 3 items, with pros and cons of smoking using a 5-point Likert scale (1 = 'definitely not important' to 5 = 'definitely important'). Overall speaking, the subjects were ambivalent on smoking as they reported moderate mean levels of pros and cons of smoking, around the middle point 3, at baseline. The 4-item version of the Perceived Stress Scale (PSS) was used to measure perceived stress with a 5-point Likert scale. The overall PSS score ranges from 0 to 16 with higher scores indicating more perceived stress. The subjects reported they had a low level of perceived stress with a mean score of 6.1 (SD = 2.9).

Table 10. Six psychosocial factors related to smoking at baseline (N=270)

	Mean (SD)
Importance of quitting smoking (0 = 'least important' to 100 = 'most important')	86.1 (15.4)
Perceived difficulty of quitting smoking (0 = 'not difficult at all' to 100 = 'most difficult')	77.0 (20.2)
Confidence in quitting smoking (0 = 'not confident at all' to 100 = 'with most confidence')	67.0(21.4)
`Most difficult situation that will face in quitting smoking	
-Withdrawal symptoms	161 (59.6)
-Smokers around	117 (43.3)
-Pressure from work, personal relationship and financial	116 (43.0)
-Boredom	97 (35.9)
-Sad and despair	93 (34.4)
-Argue with others	68 (25.2)
-Drink alcohol/coffee	56 (20.7)
-Invite to smoke by others	46 (17.0)
-Can't concentrate	44 (16.3)
-Time pressure	43 (15.9)
-Hard to fall asleep	41 (15.2)
-Gain weight	8 (3.0)
-Increase appetite	4 (1.5)
Perceived Support	
-Spouse	151 (55.9)
-Children	91 (33.7)
-Friends	71 (26.3)
-Parents	64 (23.7)
-Counsellor	46 (17.0)
-Health care professional	29 (10.7)
-Siblings	27 (10.0)
-Colleagues	26 (9.6)
-Relatives	19 (7.0)
-None	16 (5.9)
-Teachers	1 (0.4)
Self-efficacy to resist smoking in difficult situation[1]	
-Internal stimuli	2.53 (1.02)
-External stimuli	2.82 (0.88)
Decisional Balance Inventory[2]	
-pros of smoking	3.05 (1.03)
-cons of smoking	3.25 (0.97)
Perceived Stress Scale	6.07 (2.93)

[1] Ranging from 1 = 'definitely not sure' to 5 = 'definitely sure'
[2] Ranging from 1= 'definitely not important' to 5 = 'definitely important'
[3] Ranging from 0 to 16, higher score indicates more perceived stress

4.2.3 Booster and Post-interventions

Pharmacological therapy usages

Regarding clients' pharmacological therapy usage profile, the compliance rate of clients using nicotine replacement therapy (in the form of gum/patch/inhaler or combined NRT therapy) were 98.1% at booster intervention and 96.6% at post-intervention; while the compliance rate of clients who chose to use non-nicotine replacement therapy (Bupropion/Varenicline) were 88.2% at boost intervention and 71.5% at post-intervention. Among those NRT users, most of them believed that the NRT was useful/very useful at both booster (81.7%) and post-intervention (88.6%). The major reason for non-compliance was they believed they could quit without using NRT. There were only a few clients who chose to use non-NRT and the compliance rates were 100% at the booster intervention but dropped to around 50% at the post-intervention (Table 11).

Table 11. Nicotine Replacement Therapy (gum/patch/inhaler) and non nicotine replacement therapy (Bupropion/Varenicline) usage at booster and post-interventions

	Booster Intervention (N=238)	**Post Intervention (N=208)**
NRT Usage in the past week	N(%) (missing=28)	N(%) (missing=62)
-NRT only	206 (98.1)	141 (96.6)
-Non-NRT only	2 (1.0)	3 (2.1)
-Both NRT and non-NRT	2 (1.0)	2 (1.4)
Compliance	**n/N**	**n/N**
-NRT only	180/204 (88.2)	123/172 (71.5)
-Non-NRT only	5/5 (100)	4/6 (66.7)
-Both NRT and non-NRT	3/3 (100)	1/2 (50.0)
Reasons of Non-compliance	**N=24**	**N=49**
NRT user		
-Do not want to quit	2 (8.3)	3 (6.1)
-Want to quit, but do not want to use NRT	22 (91.7)	46 (93.9)
Non-NRT user	N=0	N=2
-Do not want to quit	---	0 (0)
-Want to quit, but do not want to use non-NRT	---	2 (100)
Perceived Helpfulness of NRT (Among NRT users)	**N=180**	**N=123**
-Completely useless	2 (1.1)	2 (1.6)
-A bit useful	27 (15.0)	12 (9.8)
-Useful	86 (47.8)	40 (32.5)
-Very useful	61 (33.9)	69 (56.1)
-Not sure	4 (2.2)	0 (0)

Table 11.(con't)

	Booster Intervention (N=238)	**Post Intervention (N=208)**
Perceived Helpfulness of Non-NRT (Among Non-NRT users)	**N=0**	**N=4**
-Completely useless		0 (0)
-A bit useful		0 (0)
-Useful		1 (25.0)
-Very useful		3 (75.0)
-Not sure		0 (0)

Withdrawal symptoms

Results on withdrawal symptoms of smoking cessation were similar at both the booster and post-interventions. Among the nine withdrawal symptoms of smoking cessation, 'desire to smoke' was the most frequently reported by the clients as 'serious/very serious', followed by 'increase appetite'. The proportions of clients who reported being 'depressed' and having problems with 'increase appetite', and 'gain weight' increased while proportions of the other six withdrawal symptoms dropped from the booster intervention to the post-intervention (Table 12).

Table 12. Withdrawal symptoms reported by subjects at booster and post-interventions

	Never N (%)	Mild N (%)	Moderate N (%)	Serious N (%)	Very Serious N (%)
Booster intervention					
Desire to smoke	14 (6.7)	80 (29.6)	73 (35.1)	35 (16.8)	6 (2.9)
Agitation	94 (45.2)	52 (25.0)	41 (19.7)	19 (9.1)	2 (0.7)
Anxiety	112 (53.8)	47 (22.6)	37 (17.8)	12 (5.8)	0 (0)
Can't concentrate	94 (45.2)	59 (28.4)	43 (20.7)	11 (5.3)	1 (0.5)
Irritated	100 (48.1)	53 (25.5)	40 (19.2)	14 (6.7)	1 (0.5)
Depressed	147 (70.7)	36 (17.3)	19 (9.1)	6 (2.9)	0 (0)
Increase appetite	98 (47.1)	54 (26.0)	34 (12.6)	21 (7.8)	1 (0.5)
Gain weight	134 (64.4)	53 (25.5)	13 (6.3)	7 (3.4)	1 (0.5)
Hard to sleep	139 (66.8)	38 (18.3)	19 (9.1)	8 (3.8)	4 (1.9)

Table 12.(con't)

	Never N (%)	Mild N (%)	Moderate N (%)	Serious N (%)	Very Serious N (%)
Post-intervention					
Desire to smoke	23 (11.6)	83 (41.7)	56 (28.1)	31 (15.6)	6 (15.6)
Agitation	103 (51.8)	48 (24.1)	29 (14.6)	14 (7.0)	5 (2.5)
Anxiety	126 (63.3)	37 (18.6)	21 (10.6)	12 (6.0)	3 (1.5)
Can't concentrate	125 (62.8)	35 (17.6)	28 (14.1)	11 (5.5)	0 (0)
Irritated	129 (64.8)	28 (14.1)	29 (14.6)	13 (6.5)	0 (0)
Depressed	152 (56.3)	20 (10.1)	17 (8.5)	10 (5.0)	0 (0)
Increase appetite	72 (36.2)	62 (31.2)	44 (22.1)	17 (8.5)	4 (2.0)
Gain weight	89 (44.7)	73 (36.7)	25 (12.6)	9 (4.5)	3 (1.5)
Hard to sleep	143 (71.9)	31 (15.6)	19 (9.5)	6 (3.0)	0 (0)

4.3 Outcomes of the Integrated Smoking Cessation Services

4.3.1 Tobacco abstinence rates

Using intention-to-treat analysis (assuming those with missing follow up had failed to quit), the self-reported 7-day point prevalence quit rates (primary outcome) increased from 52.6% (142/270) at the booster intervention to 57.8% (156/270) at the post-intervention, then reduced to 41.9% (113/270) at 26 weeks and 35.9% (97/270) at 52 weeks. At 26-weeks and 52-weeks follow-ups, all clients who reported to have tobacco abstinence in the 7 days immediately preceding the follow-up were invited to have a biochemical validation including exhaled carbon monoxide (CO) measurement, and salivary cotinine test. The participation rates for biochemical validation were modest, 53.1% (60/113) at 26 weeks and 42.3% (41/97) at 52 weeks respectively. 54 out of the 113 self-report quitters at 26 weeks and 40 out of the 97 self-reported quitters at 52 weeks passed the validation tests. The biochemically validated quit rates were 20.0% (54/270) at 26 weeks and 14.8% (40/270) at 52 weeks. The main reason for not participating in the biochemical validation tests was the client did not have time to participate.

4.3.2 Quit Attempts and Reduction in Cigarette Consumption among Continuing Smokers

Among the continuing smokers at the 4 follow-up sessions, the proportions of subjects who had attempted at least once to quit varied across the follow ups: decreased from 21.9% at booster intervention to 18.4% at post-intervention, then jumped up to 38.9% at 26 weeks and lowered back to 14.5% at 52 weeks after receiving the cessation counselling. The proportion of continuing smokers who reported a reduction in cigarette consumption by at least half compared to baseline, on the other hand, dropped from 58.6% at booster intervention to 12.7% at 52-weeks follow up (Table 13).

Table 13. Quit rate by intention-to-treat analysis

	Booster Intervention N (%)	Post Intervention N (%)	26-weeks N (%)	52-weeks N (%)
Among all clients (n=270)				
7-day point prevalence quit rate	142 (52.6)	156 (57.8)	113 (41.9)	97 (35.9)
Biochemical validated quit rate	n.a.	n.a.	54 (20.0)	40 (14.8)
Among continuing smokers	n=128	n=114	n=157	n=173
Had quit attempt(s)[1]	28 (21.9)	21 (18.4)	61 (38.9)	25 (14.5)
Reduced cigarette consumption ≥ 50%	75 (58.6)	32 (28.1)	44 (28.0)	22 (12.7)

[1] Had quit attempts in the past week for booster and post-interventions and had quit attempts within the past 4 months for 26- and 52-week follow ups.

4.3.3 Change in stage of readiness to quit

Table 14 shows the changes in stage of readiness to quit in boost and post interventions and follow-ups at 26 weeks and 52 weeks from baseline. By assuming no change in their stage of readiness to quit from baseline for those who were lost contact in the follow up, the proportion of subjects who had moved up in the stage was as high as 60.4% at booster intervention, then dropped slightly to 58.9% at post intervention, 44.8% at 26 weeks and 37.0% at 52 weeks while the proportion who had no change in the stage remained quite stable around 30% except at 40.7% at 52 weeks.

Table 14. Change in stage of readiness to quit from baseline

During Intervention	Booster Intervention			Post Intervention		
	Moved up	No change[1]	Moved down	Moved up	No change[1]	Moved down
Baseline	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Action	58 (54.7)	39 (36.8)	9 (8.5)	65 (61.3)	33 (31.1)	8 (7.5)
Preparation	84 (60.9)	49 (35.5)	5 (3.6)	77 (55.8)	46 (33.3)	15 (10.9)
Contemplation	2 (66.7)	0 (0)	1 (33.3)	1 (33.3)	2 (66.7)	0 (0)
Pre-contemplation	19 (82.6)	4 (17.4)	0 (0)	16 (69.6)	7 (30.4)	0 (0)
Total	163 (60.4)	92 (34.1)	15 (5.6)	159 (58.9)	88 (32.6)	23 (8.5)

Follow-up	26 weeks			52 weeks		
	Moved up	No change[1]	Moved down	Moved up	No change[1]	Moved down
Baseline	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Action	42 (39.6)	33 (31.1)	31 (29.2)	44 (41.5)	37 (34.9)	25 (23.6)
Preparation	62 (44.9)	44 (31.9)	32 (23.2)	41 (29.7)	62 (44.9)	35 (25.4)
Contemplation	2 (66.7)	0 (0)	1 (33.3)	2 (66.7)	1 (33.3)	0 (0)
Pre-contemplation	15 (65.2)	8 (34.8)	0 (0)	13 (56.5)	10 (43.5)	0 (0)
Total	121 (44.8)	85 (31.5)	64 (23.7)	100 (37.0)	110 (40.7)	60 (22.2)

[1] Missing data were counted as 'no change'

4.3.4 Change in psychosocial factors

Table 15 shows the impact of the intervention on 6 psychosocial factors which could be important in the quitting process. They included (1) Self-efficacy to refrain from smoking due to internal and external stimuli (using a 1-5 scale); (2) Decisional balance with two subscales of pros and cons of smoking (using a 1-5 scale); (3) Importance of success in quitting (using a 0-100 scale); (4) Difficulty in quitting (a 0-100 scale); (5) Confidence in not smoking again (a 0-100 scale); and (6) Perceived stress level (a 0-16 scale). The results from general linear model analyzes revealed that there were significant changes in all subscales of self-efficacy to resist smoking, and all subscales of decisional balance, perceived difficulty in quitting, confidence in not smoking again, and their perceived stress level; but there was no significant

change in their perceived importance of success in quitting over time. The change in the mean scores of self-efficacy to refrain from smoking due to internal and external stimuli showed an inverted U-shape which increased sharply from baseline to post-intervention, then dropped slightly at 26 weeks and remained stable at 52 weeks. The change in the mean score of pros of smoking showed a U-shape with a sharp drop from baseline to post-intervention, then raised to a similar level as the baseline at 26 and 52 weeks while the mean score of cons of smoking increased steadily over the study period. The Difficulty mean score dropped sharply from baseline to post-intervention and remained stable thereafter and the Confidence mean score showed an inverted U-shape. The Perceived Stress mean score dropped from baseline to post-intervention but increased sharply at 26 weeks and 52 weeks.

Table 15. Mean scores of six psychosocial factors related to smoking over time

Scale	**n**	**Baseline**	**Post-intervention**	**26 weeks**	**52 weeks**	**p-value**
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Self-efficacy to refrain smoking[1]						
Internal Stimuli	122	2.52 (1.00)	4.11 (1.12)	3.33 (0.97)	3.16 (1.14)	<0.001
External Stimuli	131	2.85 (0.91)	4.25 (1.01)	3.31 (0.99)	3.31 (0.99)	<0.001
Decisional Balance Inventory[2]						
Pros of smoking	123	3.25 (0.94)	2.17 (1.10)	3.14 (0.80)	3.18 (0.88)	<0.001
Cons of smoking	123	2.91 (1.07)	2.95 (1.24)	3.27 (0.76)	3.50 (0.76)	<0.001
Importance of success in quitting[3]	123	83.0 (16.9)	85.9 (15.1)	83.6 (16.2)	80.7 (19.1)	0.060
Difficulty in quitting[4]	123	76.5 (20.6)	65.7 (24.4)	65.5 (21.5)	65.3 (18.7)	<0.001
Confidence in not smoking again[5]	123	65.0 (22.6)	79.4 (17.7)	71.6 (22.3)	65.9 (23.4)	<0.001
Perceived Stress level[6]	123	1.41 (0.71)	1.27 (0.70)	1.51 (0.52)	1.61 (0.54)	<0.001

[1] 1 = 'definitely not sure' to 5 = 'definitely sure'

[2] 1= 'definitely not important' to 5 = 'definitely important'

[3] 0 = 'least important' to 100 = 'most important'

[4] 0 = 'not difficult at all' to 100 = 'most difficult'

[5] 0 = 'not confident at all' to 100 = 'with most confidence'

[6] range: 0 to 16, higher score indicates more perceived stress

4.3.5 Baseline predictors of successful quitting at 26 weeks

Bivariate analyses of 34 variables measured at baseline (demographic: 7, health-related: 5, smoking-related: 4, psychosocial: 8, and perceived support: 10) comparing self-reported quitters and non-quitters at 26 weeks are shown in Table 16. Bivariate results revealed that subject who reported quitted smoking at 26 weeks after receiving the smoking cessation intervention were more likely to be older, separated/divorced/widowed, perceived good health, had higher levels in perceived importance of and lower levels of difficulty in quitting smoking, lower score in perceived stress, less likely to be tense, depressed, or had less mental illness, and reported less perceived support from spouse, parents and counsellors (p-values < 0.2). These 12 variables were thus included in the multivariate analysis. Table 17 shows the results of logistic regression on the smoking status at 26 weeks with backward elimination. Only two (marital status and felt depressed) out of the 12 variables at baseline were found to be independent predictors of successful quitting at 26 weeks. The likelihood of successful quitting decreased if the subjects were single (Adjusted OR=0.23, p-value=0.001) or married/cohabiting (Adjusted OR=0.37, p-value=0.014) compared to those who were separated/divorced/widowed, and felt depressed (OR=0.15, p-value=0.006) or very depressed (OR=0.53, p-value=0.020) compared to those who were not.

Table 16. Association of baseline demographic, smoking-related, and psychosocial variables with smoking cessation at 26 weeks among subjects

	Quitter (n=113)	**Non-quitter (n=157)**	
Variables	**N (%) or M (SD)**	**N (%) or M (SD)**	**p-value**
Demographic variables			
Age in years (SD)	43.35 (14.38)	41.09 (12.80)	0.18
Gender (%)			
-Male	86 (76.1)	113 (72.0)	0.45
-Female	27 (23.9)	44 (28.0)	
Marital status (%)			
-Single	21 (18.6)	47 (29.9)	0.01
-Married / Cohabited	71 (62.8)	98 (62.4)	
-Separated / Divorced / Widowed	21 (18.6)	12 (7.6)	
Education (%)			
-Primary school or below	16 (14.2)	19 (12.1)	0.69
-Form 1 to Form 3	30 (26.5)	50 (31.8)	
-Form 4 to Form 7	46 (40.7)	65 (41.4)	
-Post secondary or tertiary	21 (18.6)	23 (14.6)	
Employment status (%)			
-Not in workforce	19 (16.8)	25 (15.9)	0.68
-Full-time Student	3 (2.7)	3 (1.9)	
-Employed	69 (61.1)	106 (67.5)	
-Unemployed / Retired	22 (19.5)	23 (14.6)	

Table 16. (con't)

Variables	Quitter (n=113) N(%) or M (SD)	Non-Quitter (n=157) N(%) or M(SD)	p-value
Monthly household income (HKD) (%)			
-Under 10,000	29 (25.7)	55 (35.0)	0.27
-10,000 – 19,999	47 (41.6)	55 (35.0)	
-20,000 – 29,999	21 (18.6)	22 (14.0)	
-30,000 or above	15 (13.3)	25 (15.9)	
-Depend	1 (0.8)	0 (0.0)	
Living district (%)			
-Hong Kong Island	13 (11.5)	25 (15.9)	0.23
-Kowloon	36 (31.9)	44 (28.0)	
-New Territories and outlying islands	60 (53.1)	87 (55.4)	
-Others	4 (3.5)	1 (0.6)	
Health-related variables			
Perceived health (%)			
-Very poor	3 (2.7)	5 (3.2)	0.08
-Poor	24 (21.2)	46 (29.3)	
-Good	71 (62.8)	98 (62.4)	
-Very good	15 (13.3)	8 (5.1)	
Felt tense (%)			
-Very tense	10 (8.8)	18 (11.5)	0.04
-Tense	60 (53.1)	102 (65.0)	
-Not tense	43 (38.1)	37 (23.6)	
Felt depressed (%)			
-Very depressed	3 (2.7)	15 (9.6)	0.01
-Depressed	64 (56.6)	102 (65.0)	
-Not depressed	46 (40.7)	40 (25.5)	
Reported having chronic illness (%)	26 (23.0)	40 (25.5)	0.64
Reported having mental illness (%)	10 (0.9)	25 (15.9)	0.09

Table 16. (con't)

Variables	Quitter (n=113) N(%) or M (SD)	Non-Quitter (n=157) N(%) or M (SD)	p-value
Smoking-related variables			
Years of smoking (%)			
-≤10 years	20 (17.7)	24 (30.6)	0.44
-11 – 20 years	38 (33.6)	67 (42.7)	
-21 – 30 years	31 (27.4)	41 (26.1)	
-≥31 years	24 (21.2)	25 (15.9)	
Daily cigarette consumption (%)			
-less than 10	25 (22.1)	26 (16.6)	0.65
-11 – 20	59 (52.2)	83 (52.9)	
-21 – 30	21 (18.6)	34 (21.6)	
-More than 30	8 (7.1)	14 (8.9)	
Fagerström Test for Nicotine Dependence (%)	25 (22.1)	29 (18.5)	0.50
-Low (Score 0-3)	25 (22.1)	44 (28.0)	
-Medium (Score 4-5)	63 (55.8)	84 (53.5)	
-High (Score 6-10)			
Stage of readiness to quit smoking (%)			
-Action stage	44 (38.9)	62 (39.5)	0.51
-Preparation stage	38 (33.6)	58 (36.9)	
-Contemplation stage	18 (15.9)	27 (17.2)	
-Pre-contemplation stage	13 (11.5)	10 (6.4)	
Psychosocial variables (SD)			
Self-efficacy to resist smoking[1]			
-Internal stimuli	2.50 (1.02)	2.48 (0.91)	0.87
-External stimuli	2.81 (0.92)	2.83 (0.90)	0.86
Decisional Balance Inventory[2]			
-Pros of smoking score	3.04 (1.06)	3.10 (1.02)	0.65
-Cons of smoking score	3.22 (0.95)	3.27 (0.99)	0.66
Importance of quitting smoking[3]	84.42 (16.8)	87.23 (14.3)	0.14
Difficulty in quitting smoking[4]	74.38 (22.2)	78.92 (18.5)	0.07
Confidence in quitting smoking[5]	67.61 (24.1)	66.56 (19.2)	0.69
Perceived Stress Score[6]	5.65 (2.91)	6.44 (2.91)	0.03

Table 16. (con't)

Variable	Quitter (n=113) N(%) or M (SD)	Non-Quitter (n=157) N(%) or M (SD)	p-value
Perceived support (%)			
Spouse	56 (49.6)	95 (60.5)	0.07
Friends	30 (26.5)	41 (26.1)	0.94
Parents	22 (19.5)	42 (26.8)	0.17
Siblings	10 (8.8)	17 (10.8)	0.59
Relatives	9 (8.0)	10 (6.4)	0.61
Children	36 (31.9)	55 (35.0)	0.59
Colleagues	10 (8.8)	16 (10.2)	0.71
Health care professional	11 (9.7)	18 (11.5)	0.65
Counsellor	15 (13.3)	31 (19.7)	0.16
Teachers	0 (0.0)	1 (0.6)	0.40

[1] 1 = 'definitely not sure' to 5 = 'definitely sure'

[2] 1= 'definitely not important' to 5 = 'definitely important'

[3] 0 = 'least important' to 100 = 'most important'

[4] 0 = 'not difficult at all' to 100 = 'most difficult'

[5] 0 = 'not confident at all' to 100 = 'with most confidence'

[6] range: 0 to 16, higher score indicating more perceived stress

Table 17. Logistic regression model for predicting successful quitting at 26 weeks

Variable	Adjusted Odds Ratio	95% Confidence Interval	p-value
Marital status			
Separated/Divorced/Widowed(Reference Group)	1		
Single	0.23	0.09 – 0.56	0.001
Married/Cohabiting	0.37	0.17 – 0.82	0.014
Felt depressed			
Not depressed (Reference Group)	1		
Depressed	0.15	0.04 – 0.57	0.006
Very depressed	0.53	0.31 – 0.91	0.020

4.3.6 Associations of psychosocial variables and smoking status at 26 weeks

The study also examined whether there were differences in the changes in the psychosocial variables in the quitting process of the subjects by their smoking status at 26 weeks. Table 18 shows that in general, subjects who had stopped smoking at 26 weeks reported improvements in their psychosocial status. More specifically, compared to non-quitters, quitters had significant increase in scores in self-efficacy to resist smoking due to both internal and external stimuli, and perceived importance of and confidence in quitting smoking after receiving the smoking cessation intervention.

Table 18. Comparisons of mean score in the changes of six psychosocial variables from baseline to 26 weeks by smoking status at 26 weeks

Change in psychosocial variables	Quitter M (SD)	Non-quitter M (SD)	p-value
Self-efficacy to resist smoking			
Internal stimuli	1.41 (1.06)	-0.23 (0.95)	<0.001
External stimuli	0.92 (1.21)	-0.18 (1.16)	<0.001
Decisional Balance Inventory			
Pros of smoking	-0.17 (1.22)	0.10 (1.27)	0.12
Cons of smoking	0.24 (1.41)	0.18 (1.27)	0.78
Importance of quitting smoking	3.45 (17.7)	-10.79 (18.7)	<0.001
Difficulty in quitting smoking	-13.23 (28.5)	-7.62 (19.8)	0.093
Confidence in quitting smoking	13.72 (25.4)	-8.27 (26.0)	<0.001
Perceived Stress Score	0.07 (0.81)	0.16 (0.68)	0.36

#Missing data were excluded from analysis

4.4 Satisfaction with the smoking cessation services of TWGHs Integrated Centre on Smoking Cessation at post-intervention (8-12 weeks)

Among the 207 clients who had received the integrated smoking cessation services of TWGHs Integrated Centre on Smoking Cessation post-intervention at 8-12 weeks, majority were satisfied with the overall service provided, with an average score of 90.1 (out of a maximum of 100). Almost the entire group of subjects found the counsellors friendly (99.0%); health care professionals (77.8%) and counsellor (98.6%) responsive to their questions about smoking and quitting. Over 95% of the clients thought the service helped them think about questions on smoking and quitting (95.7%) and the service motivates quitting (97.6%). Most of the clients were satisfied with the telephone follow up (96.1%) and over 90% of them were likely to recommend the service to the others (91.3%) (Table 19).

Table 19. Satisfaction with the integrated smoking cessation services of TWGHs Integrated Centre on Smoking Cessation (N=207) at post-intervention (8-12 weeks)

	N (%)
Friendliness of counsellor	
-Yes	205 (99.0)
-No	0 (0.0)
-No comment	2 (1.0)
Responsiveness of counsellor to questions about smoking and quitting	
-Can	204 (98.6)
-Cannot	0 (0.0)
-No comment	3 (1.4)
Responsiveness of health professionals to questions about smoking and health	
-Can	161 (77.8)
-Cannot	0 (0.0)
-No comment	46 (22.2)
Service helps to think about questions about smoking and quitting	
-Yes	198 (95.7)
-No	0 (0.0)
-No comment	9 (4.3)
Services motivate quitting	
-Yes	202 (97.6)
-No	0 (0.0)
-No comment	3 (2.4)
Satisfaction towards telephone follow up	
-Yes	199 (96.1)
-No	2 (1.0)
-No comment	6 (2.9)
Likeliness to recommend services to others	
-Yes	189 (91.3)
-No	0 (0.0)
-Maybe	9 (8.7)
	Mean (SD)
Satisfaction towards overall service (0: not satisfactory at all and 100: most satisfactory)	90.1(9.66)

5 Discussions

5.1 Utilization of services in the Integrated Centre on Smoking Cessation

A total of 270 clients were recruited within a period of 7 months from 1 August 2009 to 28 February 2010, i.e. 38.6 clients per month. The recruitment rate of clients was considered satisfactory given that many smokers in Hong Kong were reported to be unmotivated to quit (Census & Statistics Department, 2008). The four community-based integrated centres on smoking cessation are located in easily accessible areas in Mongkok, Shatin, Tuen Mun, and Wan Chai, and our services are available after office hours as well as during weekends, to cater for the high proportion of employees with long working hours in Hong Kong (General Household Survey Section, 2008). These community based centres has attracted a group of smokers where majority have high nicotine dependency, perceived poor or very poor health (71.1%), felt tense or very tense (70.4%), and felt depressed or very depressed (68.2%).

In addition, the enhanced publicity on smoking cessation launched by the HKSAR Government in 2009, and particularly the increase in tobacco tax by 50% in February 2009, had led to increased awareness of the importance of quitting, hence the increased need for the service especially right after the announcement of the tax increase. The availability of the Integrated Centre on Smoking Cessation provided by TWGHs also increased motivation of smokers to seek help.

5.2 The effectiveness of the Integrated Centre on Smoking Cessation

The findings have proven our individualised smoking cessation interventions were effective showing a tobacco abstinence rate of 41.9% at 26 weeks and 35.9% at 52 weeks follow up (Table 13). The existing integrated model of counselling and use of pharmacotherapy was more intensive, hence the quit rate was much higher compare to that of other local studies and very encouraging. For smokers who continued to smoke after the intervention, smokers had reduced smoking as well as made attempts to quit.

After receiving the cessation intervention, clients showed an overall increases in their self-efficacy to resist smoking, increased perceived cons of smoking, a decrease in perceived difficulty in quitting and increase in confidence of not smoking again. Their perceived importance of quitting and stress level remained quite stable, and perceived pros of smoking and confidence in not smoking again returned to the baseline level after an initial improvement during the study period (Table 18). A large of proportion of subjects (>35% at

each of the 4 time points) moved up in their stage of readiness to quit during the process of quitting (Table 14). Quitting is a process, and the improvement of these psychosocial variables and motivation towards quitting after the intervention is very encouraging as it sets the scene for future successful quitting. In addition, most clients were satisfied with the cessation service and would introduce the service to other smokers.

5.3 Use of combined therapy (pharmacotherapy and counselling)

All of the eligible smokers were prescribed with pharmacological therapy to aid their smoking cessation and many of them used nicotine replacement therapy (NRT). The compliance rate to pharmacotherapy was very high at the booster intervention but slightly dropped at the post-intervention (Table 11). We found that it is a common practice to stop using NRT when the smokers believed that they can successfully quit without using NRT (Chan et al., 2010), hence counselling on NRT compliance in completing the entire course of treatment can be strengthened.

The overall high compliance rates (over 90%) in this study is encouraging and could be due to the free pharmacological therapy provided in this study with frequent regular follow-ups as well as phone calls by the smoking cessation counsellors. Chan et al (2011) had provided evidence on the effectiveness of behavioural counselling plus free NRT on unmotivated smokers in achieving higher rates in adherence to NRT and quitting smoking. In line with previous findings, our results also supported that it might be a feasible and cost-effective approach in helping Chinese smokers to reduce or quit smoking by offering free NRT (Chan et al., 2010), combined with counselling, to achieve a higher abstinence rate.

5.4 Importance of psychosocial support during smoking cessation counselling

At 26 weeks follow up, those who reported quitting had significantly increase their scores in self-efficacy to resist smoking due to both internal and external stimuli, perceived importance of and confidence in quitting smoking compared with non-quitters (Table 16). The observation highlights the important role of providing psychosocial care to increase the smoker's self-efficacy to resist smoking across different situations, their perceived importance and confidence to quit, which ultimately can lead to successful quitting among the Chinese smokers.

The results of this study have shed some light on the importance of the association with self-efficacy and quitting among Chinese smokers and future smoking cessation interventions for Chinese smokers should focus on boosting self-efficacy to resist smoking (Morrell et al., 2011). Our results on baseline predictors of successful quitting at 26 weeks also showed that psychosocial support during the cessation process is very important. From the literature, those who were separated/divorced/widowed and those who felt depressed were more vulnerable and need more support in the quitting process. Given the majority of the smokers who came to the centres felt depressed, tense, and have perceived poor health, the comprehensive bio-psycho-social support and the intensive counselling provided by our multidisciplinary team of health care professionals seemed to have met the needs of this vulnerable group in particular.

5.5 Role of social workers in smoking cessation interventions

This project showed that including professionals from several disciplines is a viable solution for promoting smoking cessation. The attention to include more professionals in the community to care about this major public health problem of smoking, and to be trained to offer smoking cessation counselling is the way forward. Leung et al. (2007) included social workers in an elderly smoking cessation training program, and that study reflected that 'social workers" are trained to identify and counsel disadvantaged and marginalized groups in the community who are particularly at risk for smoking and are either reluctant or have problems accessing cessation services. (Leung et al., 2007, p.1158).

This project pointed out that social workers who received appropriate training in smoking cessation counselling is able to deliver counselling and psychosocial support to smokers in the community. The present project indicated the effectiveness of the multi-disciplinary model in the community and inspires further development of community-based smoking cessation counselling services managed by a multi-disciplinary team, beyond the hospital setting.

5.6 Limitations

5.6.1 Operation hours and availability of services of the Integrated Centre on Smoking Cessation

One of the limitations of the present study was the operation hours and availability of services from the Integrated Centre on Smoking Cessation. In order to provide more accessible smoking cessation services to the clients, the four integrated centres on smoking cessation operates at 10 four-hour sessions (a total of 40 hours) every week with two evenings and two weekends sessions, with telephone appointments received through voicemails (during non-operation hours) being dealt with in a prompt fashion. Nevertheless, this time table and limited number of centres might still have reduced its accessibility to some potential users, and future services should consider having more community based smoking cessation centres at accessible locations in different regions throughout the territories and increase evening and weekend sessions to meet the needs of the clients.

5.6.2 Limited availability of medical services

Owing to problems with doctor recruitment and resources constraints, medical consultations were only available in Mongkok and Wan Chai centres when the cessation service was first launched. The temporary limited availability of medical services might have hindered the provision of non-NRT prescription (i.e., Bupropion or Varenicline) to smokers, which might have affected the intervention in some ways. Nevertheless, many studies showed that pharmacotherapy is only effective when it is combined with counselling (Fiore et al, 2000). Trained smoking cessation counsellors are available in every centre and it is important to have adequate resources to provide both counselling as well as pharmacotherapy.

5.6.3 Non-random clinical sample

Although the smoking cessation intervention was found to be effective in helping Chinese smokers in Hong Kong, the current results should be interpreted with caution for the studied sample was not randomly selected and in small size. This could limit the generalization of the results. Further studies will be needed to study the characteristics of Chinese smokers, and their process of quitting, including successes and failures, especially in the context of a rapidly changing smoking environment due to other tobacco control measures (such as the proposed increase in tobacco tax in February 2011) in Hong Kong. Moreover, randomised controlled trials to test this comprehensive smoking cessation intervention combining both bio-psycho-social support and pharmacotherapy would be warranted.

6 Recommendations and Implications

This is the first systematic study which has demonstrated an acceptable, effective, and feasible model of building tobacco control capacity among HCPs through appropriate training, and establishing an Integrated Centre on Smoking Cessation staffed by multi-disciplinary professionals in Hong Kong. The findings from this project have implications for future development of smoking cessation services in Hong Kong, China, and the rest of the Asian Pacific Region.

(i) Use of an integrative approach by a multi-disciplinary team

This project is a promising model of providing community-based integrated services of smoking cessation. With a multi-disciplinary team comprising medical officers, clinical psychologist, nurse and social workers to work in partnership, the project provides a fully integrated, comprehensive smoking cessation service to smokers in the community. Since both pharmacotherapy and psychological counselling are included in smoking cessation services, this innovative approach can be particularly effective in assisting smokers to quit. This service model can be a benchmark for subsequent community based smoking cessation services development in the Chinese population.

(ii) Comprehensive assessment and tailored treatment plan

The baseline questionnaire provides a comprehensive assessment of nicotine dependency, motivation and intention to quit, and psychosocial barriers and facilitators to quit, for every client. A tailored treatment plan can thus be formulated based on the smoker's smoking history, nicotine dependency, psychosocial history and motivation to quit. During the treatment planning, clients could join individual or group counselling to suit their needs, so that they continue to the cessation treatment and reduce the lost to follow up.

(iii) Regular and systematic follow up services

Regular and systematic follow-up sessions provided to clients during the quitting process are very important to ensure compliance and prevent relapse. The trained counsellors can collect a detailed account of the smoking status, withdrawal symptoms and problems encountered during the quitting process with a standardized follow up questionnaire so that they can detect signs of relapse, adjust the quitting plan and provide appropriate counselling according to the needs and changes of the clients during the quitting process.

(iv) Combination therapy and booster smoking cessation counselling

The results of this project indicate that providing counselling at regular intervals in the quitting process appears to be one of the key ingredients contributing to success in helping smokers to stop smoking. The higher quit rate in the current project may therefore be attributed to the intensity of counselling and good rapport with Smoking Cessation Counsellors. As Fiore et al. (2008) highlighted, there is a dose-response relationship in the intensity of counselling to successful cessation. Hence, increasing the intensity of intervention by providing additional booster sessions on a as-need basis appears to have contributed to a higher quit rate. This result has significant implication to future development of smoking cessation services in the local context as combination therapy with counselling and pharmacotherapy has been shown to be more effective than having either one of the component (Macleod et al., 2003; Fiore et al, 2008).

(v) The relationship between smoking behaviour and mood management

There is a need to highlight the relationship between the smoking behaviour and mood management during the process of cessation. More treatment attention should be placed on relapse prevention and emotional support during quitting, and to avoid the negative labeling of unsuccessful quitters by health care professionals or family members. Furthermore, smokers themselves can pay particular attention to emotion control and stress management in the quitting process. They should note that smoking is not a good or the only coping strategy for stress management and should seek healthy alternatives to handle life stress. Appropriate referrals to community resources may help clients resolve prolonged and difficult life stressors. This project has shown that the strengthening of self-efficacy of smokers to effectively deal with life problems and difficult emotions during smoking cessation can contribute to successful quitting.

(vi) Building capacity in tobacco control and smoking cessation for all health care professionals

On the whole, through appropriate training and capacity building, we have demonstrated that trained "Smoking Cessation Counsellors" (SCCs) are successful in delivering smoking cessation intervention to motivate and help smokers quit smoking in Hong Kong. It is recommended that smoking cessation training should be offered to all health care professionals to strengthen their role in smoking cessation so that they can incorporate prevention and early cessation interventions in their routine practices to reduce smoking prevalence and health care costs in the long run.

7 DELIVERABLES

To date, the work associated with this project had resulted in the following outputs:

1. Chan S.S.C., Leung D.Y.P., Yiu I.T.L., Chan H.C.H., Wan M., Kong H.W.M., Lam T.H. (2010). Characteristics of smokers receiving interventions in Integrated Centres on Smoking Cessation in Hong Kong. Poster presented *at the 9th Asia Pacific Conference on Tobacco or Health*, Sydney, Australia, Oct 6-9, 2010.

2. Chan S.S.C., Leung D.Y.P., Yiu I.T.L., Chan H.C.H., Wan M., Lam T.H. (2010). The effectiveness of community Integrated Centre on Smoking Cessation in helping smokers quit smoking: Preliminary results. Poster presented at *The 4th Cross Strait Conference on Tobacco Control*, Nov 4-5, 2010, Macau.

3. Chan S.S.C., Chan H.C.H., Yiu I.T.L., Lam T.H. (2011). Promoting smoking cessation through community-based integrated centres: A successful experience in Hong Kong. Paper presented at *The 3rd Asian Pacific Problem Gambling and Addictions Conference 2011*, June 2-3, 2011, Hong Kong.

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