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The Effect of a Government Anti-Smoking Campaign on Patient Demand for Smoking Cessation Advice from Dentists

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A treatise submitted in partial fulfilment of the requirements for the degree of

MASTER OF DENTAL SCIENCE

Community Oral Health and Epidemiology

Faculty of Dentistry
The University of Sydney
Australia 2007
Dedication

This treatise is dedicated to my husband Andry Mediawan,
my two lovely daughters Putri Farhah Thali'ah and Salsabila Khairunissa for their unconditional love, support and encouragement.
Acknowledgements

I wish to express my gratitude to everyone who contributed to making my project a reality:

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<td>CI</td>
<td>Confidence Interval</td>
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<td>df</td>
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<td>M</td>
<td>Man</td>
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Foreword

This study was conducted as part of my Master of Dental Science studies at the University of Sydney 2005-2007. My studies were undertaken with considerable support from AusAID to whom I am deeply grateful for this unique opportunity. This treatise is based on a survey conducted among dentists and their dental patients in New South Wales, Australia, the purpose of which was to determine the impact of the graphic health warning labels on cigarette packs on patients’ demand for smoking cessation advice in dental offices. These graphic labels, as part of the National Tobacco Campaign in Australia, were introduced during the first year of my MDSc candidature and provided an excellent framework for this investigation during my second year. I received invaluable assistance by the Australian Dental Association, NSW Branch to contact the dentists in NSW and I thank the ADA Immediate Past President, Dr. Chris Wilson, and the ADA CEO, Dr. Matthew Fisher, for their personal assistance with this. The study was supported financially by the Australian Dental Research Foundation (ADRF) for which I am grateful.

The treatise is divided into three parts:

**Part One:** A review of the international literature on the tobacco control, health promotion campaigns, effect of smoking on oral health, and smoking cessation in dental clinics.

**Part Two:** Patient demand for smoking cessation advice in dentist offices after introduction of graphic health warnings in Australia. The format of Part Two is a paper that has been submitted for publication in the Australian Dental Journal.
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PART 1

Review of Literature
Introduction

Tobacco use is the fourth most common risk factor for chronic diseases in the world. It is the leading preventable cause of premature death and several diseases, particularly from cardiovascular disease, cancers of the lung, larynx, and mouth; and chronic obstructive pulmonary disease. Every year, 5 million people die due to tobacco smoke, and this number is predicted to increase to 10 million by 2020. Due to population expansion the number of smokers is most likely to rise from 1.4 billion to over 1.6 billion by 2030.

Data from 2003 showed that 8.0% of the total burden of disease in Australia was caused by tobacco use. To overcome this problem, tobacco control has been implemented in every state in Australia since 1980. Furthermore, in June 1997 The Australian National Tobacco Campaign (NTC) was launched and has continued since then. The NTC is a collaboration between Federal and State/Territory jurisdictions and related non-government organizations. Evaluation reports of the NTC show overwhelmingly that mass-media anti smoking campaigns promote quitting and discourage uptake of smoking. The successful launch of Canada’s graphic health warnings in 2007 prompted the Australian Government to implement the regulation that from 1 March 2006 all cigarette and cigar packages must carry graphic health warning labels.

There is overwhelming evidence showing that tobacco use causes a number of different oral health problems. Tobacco causes bad breath, stained teeth and decreases senses of taste and smell. The use of tobacco in any form causes oral cancer and pre-cancer. Smokers showed five to ten times the risk of dying from mouth and throat cancer compared with someone who has never smoked. Tobacco is also a significant risk factor for periodontal disease and impairs healing of gum and bone. Dental implants are more likely to fail in people who are smokers. Stopping smoking reduces the risk of developing periodontal disease and improves wound healing. Smoking cessation also
halves the risk of developing oral cancer in five years and the risk continues to decline over time.  

The World Dental Federation (FDI) states that “Helping patients stop smoking may be the single most important service dentists can provide for their patients” and urges every Member Association and Oral Health Professional to “take decisive actions to reduce tobacco use and nicotine addiction among the general public as well as to integrate tobacco use prevention and cessation services into their routine and daily practice”. Dentists can play an important role in preventing oral health problems due to tobacco smoking by delivering screening for tobacco use and providing smoking cessation services, however reviews show that the role of dentists in smoking cessation activities has not been conclusively proven.

This treatise comprises of two parts, where part 1 is a comprehensive literature review on the effect of smoking on oral health and previous studies on smoking cessation in dental offices. The first part also discusses tobacco control programmes in Australia as well as some previous studies that have been done in this field. The objective of the review is to provide a basic understanding and knowledge in doing research on "Patient demand for smoking cessation advice in dentist offices after introduction of graphic health warnings in Australia", that is discussed in part 2 of the treatise. The best available evidence (e.g. Randomized Control Trials) might have been included in the review; however in some of the topics there are only a limited number of well designed studies available. Surveys on smoking cessation studies in Australia and studies in UK and USA were included to show the effectiveness of dentists in smoking cessation activities to their smoker patients. Section of oral health promotion/dental education is included in the review to show basic health promotion done in dental practices and how effective the intervention is. Most studies on relation of smoking and oral cancer were predominantly case control and/or epidemiology trials, although there are numbers of longitudinal studies on periodontal disease and implant failures. Furthermore review on tobacco research was confined to studies focusing on health warning labels to make it in line with the research itself in part 2 which is concerned with tobacco pack warnings.
1. Tobacco Control in Australia

1.1. Smoking Prevalence in Australia

White et al conducted a review of trends in smoking prevalence between 1980 and 2001.\textsuperscript{11} It was concluded that smoking prevalence among Australian adults declined quite significantly over the 21-year period of time by 12%. Smoking prevalence in Australia was 35% in 1980 and continue to decline to 23% in 2001.\textsuperscript{11} The NTC evaluation report volume three showed that the prevalence of adult smoking decreased from 23.5% in 1997 to 20.4% in 2000.\textsuperscript{12}

The most recent survey conducted by the Australian Institute of Health and Welfare showed that the national daily smoking rates for all smokers aged 14 years and above have fallen from 19.5% in 2001 to 17.4% in 2004.\textsuperscript{13} Australia now has one of the lowest prevalence of smokers in the world.\textsuperscript{13}

1.2. The National Tobacco Campaign

Hill and Carrol (2003) reviewed tobacco campaigns in Australia.\textsuperscript{4} The Australian National Tobacco Campaign (NTC) was launched in June 1997 and has continued since. It is a full collaboration between Federal and State/and Territory jurisdictions and interested non-government organizations. The target group of NTC is particularly 18-40 year old smokers.\textsuperscript{4}

To deliver the anti-smoking message NTC has consisted of seven television commercials, radio, print and outdoor advertising, public relations, a strategy aimed at people from non-English speaking backgrounds (NESB) and a strategy aimed at service providers. Television was selected as a primary medium. Each advertisement is intended to give smokers some new information about smoking and to emphasize the immediate effect of smoking to the body. The key slogan for NTC is “Every Cigarette is doing you damage”.\textsuperscript{4}

In the first six months since the launch of the NTC, around AU$8 million of Federal and State/Territory funding had been spent on the campaign. It included around AU$4.5 million being devoted for mass media educational campaigns, with most of the funding
coming from the Federal Government. Around $2 million has been budgeted continuously every year to maintain the campaign. Many states have provided additional funding toward the NTC. An internet quit website and a national ‘quitline’ hotline service number have been built to support demand for cessation help and information services. For the first two years of NTC, federal government had committed $7 million to the Campaign.4

The NTC involved partnership to reinforce the credibility of the campaign and get the message to reach a wider target group. The national partners in the campaign are The Australian Medical Association, The Royal Australasian College of General Practitioners, The Pharmaceutical Society of Australia, The Pharmacy Guild, The National Heart Foundation, The Australian Cancer Society and The National Asthma Campaign.14 The NTC was also enhanced with the introduction of nicotine replacement therapy (NRT) advertising in 1997. Since that time smokers have had a wider access to over the counter NRT.4

In NSW, the short term objectives of the NSW Tobacco Action Plan 2005-2009 are to reduce smoking prevalence, reduce the number of children and young people who start smoking, and to reduce the number of passive smokers. The long term objectives are to decrease the morbidity and mortality due to tobacco smoking, and to reduce the social and economic costs of tobacco-related illness.15

1.3. Health Warnings on Tobacco Product

1.3.1. Previous health warnings system for Australian tobacco products

Chapman and Carter provided a critical review of the history of health warning labels on tobacco products since their introduction in 1973.16 The authors revealed four strategies used by the Australian tobacco industry to delay and weaken the health warning labels. These were: (1) “submissions to government; (2) private action to influence politicians and the media; (3) use of third parties, and (4) commissioning research”. The first generation of the health warning label was introduced in January 1973 and contained only one small warning label reading “Warning. Smoking is a health hazard”. The
implementation of the warning faced a delay of 52 months since the legislation was introduced in June 1969. After a decade of lobbying from Australia health organizations, the second generation of health warning labels was implemented in 1987. It again faced resistance from tobacco manufacturers since the federal regulation was introduced in 1985, particularly for warning label carrying the message that smoking is addictive. After negotiations, the warning label that smoking is addictive was compromised with “Smoking reduces your fitness”. The second generation of health warnings carried another three warning labels that smoking causes lung cancer; heart disease and damages lungs. The third generation of health warning comprising more comprehensive messages on the hazards of smoking took effect in January 1995.¹⁶

All cigarette, loose tobacco and cigar products manufactured in Australia after 1 January 1995 and those imported to Australia after 1 July 1995 needed to comply with the system of text-based health warnings.¹⁷ The black and white, text based health warning system occupied the top 25% of the front of the pack. On the back of the pack, the text printed in black on a white background occupied 33% of the pack and provided detailed health information (corresponding with the front of the pack warning). One side of the cigarette packs carried information about the average yields of tar, nicotine and carbon monoxide content of cigarettes. There were six text-based health warnings as listed below:

- smoking causes lung cancer
- smoking is addictive
- smoking kills
- smoking causes heart disease
- smoking when pregnant harms your baby
- your smoking can harm others¹⁷

1.3.2. New Health Warning System for Tobacco Products

In August 2004, the Australian Government approved a picture-based health warning system for cigarette and cigar packages. New colour graphic health warnings were introduced through amendments to the Trade Practices (Consumer Product Information Standard) (Tobacco) Regulations 1994 under the Trade Practices Act 1974. Subsequent minor amendments were gazetted in October 2005. The law required that from 1 March
2006 tobacco products manufactured or imported into Australia should be printed with the graphic health warning. The new warnings occupy 30% of the front and 90% of the back of cigarette packs. They are intended to provide strong and confronting messages about the harmful health consequences of smoking to the human body.\textsuperscript{17,18}

The new health warning system consists of fourteen health warnings comprising graphic images, warning messages and explanatory health messages. There are two sets of graphic health warnings, each consisting of 7 graphic health warnings. To optimize consumer knowledge and awareness of the health effects of smoking, each set is alternated every 12 months. The picture warnings appear on both the front and back of the cigarette packages, tobacco pouches and loose tobacco packages. Cigarette packages have health warnings covering 30% of the front and 90% of the back of the packs. Health warnings should cover 30% of the front and 50% of the back of tobacco pouches and loose tobacco packs. The side of the cigarette pack has an information message on the health effects of chemicals in tobacco smoke. The information message covers one full side of cigarette packets and 25% of one side of cigarette cartons. Every cigarette pack carries the advice: "You CAN quit smoking. Call Quitline 131 848, talk to your doctor or pharmacist, or visit www.quitnow.info.au". Pipe and tobacco pouches are still permitted to carry adhesive labels, but these are not permitted for flip-top, soft pack cigarettes and cartons. November and February (inclusive) each year are the transition periods to allow the phase-out of the previous set and the introduction of the next set of health warnings.\textsuperscript{17}
Figure A. Depiction of the graphic health warnings used in the Australian National Tobacco Campaign according to 2004 legislation (Set A). (Copyright permission from quitnow)
Figure B. Depiction of the graphic health warnings used in the Australian National Tobacco Campaign according to 2004 legislation (Set B). (Copyright permission from quitnow)

- Smoking Harms Unborn Babies
- Smoking Causes Blindness
- Smoking Causes Lung Cancer
- Smoking Causes Heart Disease
- Smoking Doubles Your Risk of Stroke
- Smoking is Addictive
- Tobacco Smoke is Toxic

The rotation system of set A and set B graphic health warnings are as follows:

- On or before 1st March 2006 - old health warnings or Set A warnings only
- 1 March 2006 - 31 October 2006 - Set A only
- 1 November 2006 - end February 2007 - Set A to Set B transition
• 1 March 2007 - 31 October 2007 - Set B only
• 1 November 2007 - end February 2008 - Set B to Set A transition
• 1 March 2008 - 31 October 2008 - Set A only
• This rotation pattern will then continue for the duration of the Regulations.

There are five cigar-specific health warnings comprising graphic images, warning messages and health explanatory messages. Each graphic warning should be alternate in equal number for 24 month period. Health warnings occupy 25% of the front and 33% of the back of most cigar packages. An information message is not required on cigar packaging. Adhesive labels displaying the cigar warnings are permitted for all cigar products.\textsuperscript{18}

Figure C. Depiction of the graphic health warnings on cigar packages used in the Australian National Tobacco Campaign according to 2004 legislation (Copyright permission from quit now).

- Cigars are not safe alternatives to cigarettes
- Don't let children breathe your smoke
- Cigar smoking causes lung cancer
- Cigar smoking causes mouth and throat cancer
- Cigar smoke is toxic
2. Tobacco Research on Health Warning Labels

Research undertaken by the Canadian Cancer Society and released in 2002 was intended to examine the effect of a graphic health warning in Canada. Graphic health warnings were first introduced in Canada in December 2000. The study consisted of 2,031 Canadians aged 18 years and above, including 633 smokers. It was found that the graphic warnings highlighting smoking hazards had the potential to reduce the number of people who smoked and to discourage young people from taking up smoking. The study found that for a significant proportion of smokers, the warnings increased the motivation to quit, concern about the health effects of smoking and made the package look less attractive. The study found that half of the non-smokers and 90% of the smokers had noticed the graphic health warning. Among those who noticed the warnings, specific results indicated that 43% of smokers were more concerned about the health effects of smoking because of the new warnings. The new warnings increased the motivation of 44% of the smokers to quit smoking, and 38% of those who attempted to quit in 2001 said the graphic warnings were a motivating factor. The warning depicting a mouth diseased and a lung tumour were identified by both smokers and non-smokers as the most effective graphic health warning to encourage people to quit smoking.

Hammond et al conducted a telephone survey to assess the impact of the graphic Canadian health warning on adult smoking behaviour. The study was conducted with 616 adult smokers in South Western Ontario, Canada. The base line study was conducted nine months after the introduction of graphic health warnings in Canada in December 2000, with three months follow up. They reported that almost all respondents (91%) had read the warning label and understood the warning content. This longitudinal study also showed that by reading, thinking and discussing the warning labels, smokers were more likely to quit smoking or reduce their smoking amount (OR=1.07, 95% CI: 1.03-1.12, p<0.001). During the three months follow up, 23.1% of smokers made an attempt to quit while 24.3% had cut down their smoking. The study also showed that there was no evidence of erosion or wear out after 9-12 months of the introduction of a graphic health warnings in December 2000.
Hammond et al extended their research to assess the adverse impact of Canadian graphic warning labels. A criterion for inclusion was smokers who had smoked at least 100 cigarettes in their lifetime and those who smoked at least 1 cigarette per day at the period of survey. The baseline interview was conducted approximately nine months after the introduction of the graphic health warnings in December 2000. A follow-up survey was conducted three months after that to determine any changes in smoking behaviour and record any attempts to quit. Resistance response rate at the second survey was 70%. The study showed the overwhelming result of 19% of smokers admitting that the graphic warnings had made them smoke less, contrary to only 1% of them who reported the adverse effect. Even though 36% of respondents reported trying to avoid the graphic warnings, it didn’t make them less likely to read and think about the warning nor did it make them quit smoking. The finding of the research also suggested that there was a strong positive relationship between the feeling of fear and disgust to the graphic warning with a respondent likely to quit and smoke fewer cigarettes. Smokers who reported greater fear were two times more likely to cut down the amount of cigarettes smoked (OR=2.02; 95% CI: 1.59-2.60) and were more likely to quit (OR=1.82; 95% CI: 1.50-2.22). The greater feeling of fear and disgust, the more likely they were to smoke fewer cigarettes and make greater effort to quit both at the baseline and also at the 3 month follow up. It was also reported that half of the respondents wanted to see even more health information on cigarette packets, in contrast to 27% of them who felt that the warning was too much and only 13% felt that the warning was inaccurately showing the smoking related risks.

A large international tobacco control survey to evaluate the effectiveness of cigarette warning labels to increase smokers’ knowledge of health effects of smoking was conducted by Hammond et al. The study took place in USA, UK, Canada and Australia, countries which implemented package warning label as one of their tobacco control strategies. Just above 9000 adult smokers from representative countries participated in the study that was conducted via telephone. There were variations between health warning labels in those four countries, with Canada’s warning label having the most comprehensive explanation of health effects from smoking, had biggest warning
label, and also contained pictures to describe the health effects of smoking. USA is the country with the weakest tobacco health warnings. These variations contributed significantly to smokers' knowledge about the risk of smoking. When asked to reveal 5 health effects of smoking, smokers in Canada revealed a greater number of diseases than smokers in the other three countries, while smokers in USA showed to have the least knowledge. As the only country that has a health warning about impotence, smokers in Canada were almost three times more likely than smokers from the other three countries to know that smoking causes impotence (OR=2.68; 95%CI: 2.4-2.97). Smokers in Canada also had more knowledge on the hazard ingredients of tobacco compared to the other three countries. The study indicated warnings on tobacco packages are an important source of information for people on the health effects of smoking, and to encourage smokers to quit. The authors concluded that the health warning with a picture, occupying a larger part of tobacco packages, and a comprehensive content of health risks of smoking are more effective to increase peoples knowledge of the health risks of smoking.21

Summary

Smoking has been shown to have an adverse health, social and economic impact on society. Health warning labels, anti-smoking advertising and mass media educational campaigns were the examples of anti-smoking strategies aimed to reduce the demand for tobacco products. Studies in Canada showed that graphic health warning labels were a motivating factor to quit smoking, to cut down smoking, and to make smokers more concerned about the health effects of smoking. The study also showed that graphic health warnings did not have an adverse impact such as emotional distress on smokers. Larger health warnings with pictures and content detailing the health risks of smoking are significantly more effective at improving peoples knowledge about the health risks of smoking. The greater the feeling of disgust and fear generated by the graphic health warnings, the more likely that smokers would quit smoking. Research in Canada showed that the pictures of lung and mouth cancer were the most effective of the health warnings to make smokers quit smoking. This finding suggested that oral health professionals
should be more active in anti-smoking promotion and should integrate tobacco use prevention and smoking cessation services into their practices.

3. Effect of Smoking on Oral Health

3.1. Smoking and Oral Cancer

Gupta et al\textsuperscript{22} conducted a large scale epidemiologic survey of oral cancer and precancerous lesions covering five districts and four states in India. The survey involved annual examinations of 12,217 Indian villagers. The survey was conducted in 2 phases, the first being a baseline survey in 1966-69, and the second was a 10-year follow up study in 1969-77. After the 10-year follow up, the main findings of the study were:

- All of the new cases of oral cancer were found among individuals with a tobacco habit.
- All cancers were preceded by a precancerous lesion such as oral leukoplakia, preleukoplakia, submucous fibrosis, and lichen planus.\textsuperscript{22}

A review of cross-sectional studies conducted in central Europe and Hungary, showed a higher prevalence rate of leukoplakia among smokers and demonstrated a dose-relationship between tobacco and oral leukoplakia.\textsuperscript{23}

In a systematic review Llewellyn et al examined 46 studies on oral cancer in a young population.\textsuperscript{24} While most of these studies showed that 4-6% of oral cancer cases now occurs in people who are less than 40 years of age, the review also highlighted conflicting evidence indicating that some studies showed that oral cancer occurred in young people that never smoked or consumed alcohol. There is still disagreement of whether these two factors are significant in young people due to the relatively short time frame of exposure. The reviewers suggested that further research be conducted to examine other potential factors, such as genetic, stress, and environmental exposures.\textsuperscript{24}

Lopez et al conducted a study on the risk of tobacco smoking, alcohol consumption and oral hygiene attributing to the development of oral cancer.\textsuperscript{25} This case control study was
carried out in Madrid, Spain. The study compared 75 people who had intra oral cancer to 150 healthy people. It demonstrated a strong dose-response relationship between tobacco use and the risk of the development of oral cancer. Smokers who consumed more than 20 cigarettes per day had more than twice the risk to have oral cancer, compared to those who smoked less than 20 cigarettes per day. The study also found that people who brush their teeth daily are almost half as likely to develop oral cancer. Another finding was that people consuming more than 50 g alcohol per day had 5.3 times more risk of developing oral cancer compared with people who did not. It was concluded that the risk to developing oral cancer was higher through smoking than through alcohol consumption.²⁵

Llewellyn et al conducted a case control study to determine the risk factors for oral cancer in relatively younger people (≤45 years of age).²⁶ The study was conducted over a 3-year period between 1999 and 2001, involving 14 hospitals in the southeast of England, UK. Cases of oral cancer were defined as those diagnosed with Squamous Cell Carcinoma (SCC) on the lip; intra oral sites or oropharynx/tonsil. Every case was arranged to have two control subjects that had similar living area, gender, and had an age difference within 2 years with the case subject. A total of matched 53 cases and 91 controls were included in the study. Patients in the cases group were interviewed at home or in the hospital. All the control persons completed a structured questionnaire addressing tobacco habits (including betel quid/pan or supari for Asian ethnic participants); dietary habits especially fruit and vegetable consumption; and basic demographic data. The study showed that people who started to smoke before the age of 16 had an increased likelihood of developing oral cancer 7-fold (OR=7.2; 95% CI: 1.3-40.7). The risk was significantly elevated in males (OR= 19.5; 95% CI: 1.3-286.8), but no significant elevated risk was shown for females. People who quit smoking had a large health benefit of significant reduction in risk for oral cancer (OR= 0.2; 95% CI: 0.5-0.8). The combination of smoking habits and alcohol misuse also increased the risk of oral cancer in males more than 4-fold (OR= 4.4; 95%CI: 1.1-17.7) and again this was not found significant for females. The amount of tobacco smoked per day and for those who currently started smoking was not found to significantly increase the risk of oral cancer. The study also showed that the consumption of at least three courses of fruit and
vegetables per day gave a highly significant protection against oral cancer (OR= 0.008; 95%CI: 0.01-0.8), particularly amongst females. It was concluded that oral cancer also happened in young people. Furthermore, the study showed the benefit of tobacco cessation and a diet rich in fruit and vegetables against SCC.²⁵

A survey of oral and precancerous lesions was undertaken in southern Taiwan by Chung et al.²⁷ The survey was conducted between September 1998 and April 1999, and involved 1075 individuals of 15 years and above. There were 549 females and 526 males in this survey. House to house interviews were conducted to assess smoking, areca quid, and alcohol consumption. Medical histories of diabetes mellitus (DM) and hypertension were also taken into consideration. The diagnostic criteria of precancerous lesions were based on WHO criteria and the recommendation from the first seminar on “Oral Leukoplakia”. The data showed a significantly bigger proportion of males than females who had smoking, alcohol drinking and areca quid chewing habits. Overall, the researcher detected 136 precancerous lesions (12.7%). Leukoplakia was the most common precancerous lesion (7.44%); followed by lichen planus (2.98%), erythroplakia (1.95%), oral submucous fibrosis (1.58%) and verrucuous lesions (0.84%). Homogenous leukoplakia was more prevalent than non homogenous leukoplakia. A significant increased risk by 4.86; 3.58; and 8.4 for developing oral precancerous lesions was found for those participants who smoked cigarettes, drank alcohol, and chewed areca quid respectively. The combined risk factors of the three habits increased the likelihood for developing oral leukoplakia by 15 times (OR=15.2; 95%CI: 6.34-36.05). The synergistic effect of cigarette smoking and areca quid significantly elevated the risk of developing submucous fibrosis 152-fold (OR=151.9; 95% CI: 19.08-999.99) compared with abstainers.²⁷

From 1995 to 1998, Nagao et al conducted a precancerous lesion screening in Tokoname city, Japan.²⁸ Over the 4-year follow up period, they found a retention rate of 66.5% (n=6340). The age range was 40 to 95 years of age. The diagnostic criteria for oral cancer and precancerous lesions were based on WHO and Malmo criteria. Self-administered questionnaires were used to collect socio demographic information; history of smoking and alcohol use; and also medical history of diabetes mellitus (DM) and

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hypertension. A total of 18 new cases of oral leukoplakia was found. Of these, 11 (61%) were idiopathic leukoplakia and seven (39%) were smoking-associated leukoplakia. In the 4-year follow up period, the researchers found 29 new cases of oral lichen planus. The age adjusted incidence rate for all lesions was significantly higher in males than in females. Even though the prevalence of smokers among those who developed leukoplakia was higher than the abstainer, however, these differences did not reach statistical significant (p=0.232). Among 723 participants (11.4%) who were current smokers and alcohol users, only two cases of leukoplakia (0.3%) and one case of oral lichen planus (0.1%) were newly detected. The authors assumed that the lower incidence might be due to lower compliance of smokers to follow the annual screening. This was the first study for oral precancerous lesion conducted in a developed country.28

Summary

Epidemiologic studies in different populations (e.g. India, Spain, UK, Taiwan and Japan) have indicated that smoking is a significant risk factor for the development of oral precancerous lesions and oral cancer. Oral precancerous lesions frequently precede oral cancer. It was also found that oral cancer does not just occur only in the elderly, but also in younger people below 40 years of age. One study showed that people who started to smoke before the age of 16 had a 7-fold increase in the likelihood of developing oral cancer. However, a systematic review showed conflicting evidence on whether tobacco and alcohol were significant risk factors for oral cancer in young adults compared to elderly people. The synergistic effect of tobacco, alcohol and areca use has been shown to increase the risk of oral cancer over tobacco alone, especially in males. Studies also show a strong dose-response relationship between tobacco use and precancerous lesions and oral cancer. The risk of oral cancer decreased significantly when individuals quit smoking. Diets rich in fruit and vegetables have been implicated to have a preventive effect against the development of oral cancer.

3.2. Smoking and Periodontal Disease

A case control study of 210 dental hygienists (who had a high standard of oral hygiene) was conducted in Sweden during 1987.29 The loss of the interproximal bone height was
measured as the distance from the cemento-enamel junction (CEJ) to the interdental septum (IS) using bite-wing radiographs analysis and the smoking habits were assessed by mailed questionnaires. The authors concluded that CEJ-IS distance was significantly greater in smokers when compared to non-smokers. It was suggested that the loss of periodontal bone is related to smoking even when a high standard of oral hygiene is practiced. There was also a dose-response relationship of smoking and periodontal bone loss, when the CEJ-IS distance increased with increased smoking exposure.\textsuperscript{29}

Stoltenberg et al\textsuperscript{30} conducted a study to determine the association between cigarette smoking, bacterial pathogens and periodontal status. The study consisted of 615 American adults. Plaque bacteria was collected from smokers and non-smokers. Confounding factors such as age, sex, plaque, and calculus were controlled. Smoking habits were self-reported. The authors concluded that comparing the presence of any of the five subgingival colonisations (\textit{A. actinomycetemcomitans}, \textit{P. gingivalis}, \textit{P. intermedia}, \textit{E. corrodens}, \textit{F. nucleatum}), cigarette smoking was a stronger risk indicator for the presence of a mean posterior proximal probing depth $\geq 3.5$ mm. Smokers were five times more likely to develop a mean probing depth $\geq 3.5$ mm than non-smokers (OR=5.3; 95 % CI: 2.0-13.8). However, with regard to the presence of the five bacteria, no statistical difference was found between smokers and non-smokers.\textsuperscript{30}

Grossi et al\textsuperscript{31} conducted a study to examine the risk indicators for alveolar bone loss associated with periodontal disease. The study was conducted in Erie County, New York State, and involved 1,361 participants with an age range between 25 to 74 years. Sixty percent of the participants were current or former smokers (n=60.7%), whereas thirty-nine percent (n=39.3%) of the sample had never smoked. The proportion of women and men was almost the same (669 females and 665 males). Radiographic examinations included taking 10 intraoral radiographs, 4 posterior vertical bite-wings and 6 anterior periapicals. Soft tissue, dental caries, supragingival plaque, gingival bleeding, probing depth, and clinical attachment level were assessed. It was observed that smokers had significantly greater risk to experience severe bone loss than non-smokers. A study showed a dose-response relationship with odds ranging from 3.25 (95% CI 2.33-4.54) for light smokers to 7.28 (95% CI 5.09-10.31) for heavy smokers. Light smokers were those
who had smoked more than or equal to 15 packs a year, while heavy smokers were individuals who had smoked more than 30 packs a year. It was also found that male smokers were 1.29 times more likely to have severe bone loss than female smokers (OR=1.29; 95% CI: 1.05-1.61).\textsuperscript{31}

Bostrom et al\textsuperscript{32} conducted a prospective 5 year cohort study to evaluate the outcome of periodontal surgery intervention. The study consisted of 20 smokers, 20 former smokers, and 17 non-smokers in the age range 37-77 years. All the participants had periodontal surgery intervention and received regular maintenance care thereafter. Supragingival plaque, gingival bleeding and pocket probing depth were measured, and the overall outcome showed a reduction of periodontal probing depth and bleeding while probing. The result of this 5-year follow up study showed that patients who smoke experienced less favorable or unchanged bone height increment following periodontal surgery, compared to non-smoker patients.\textsuperscript{32}

A 10 year prospective cohort study to investigate the effect of smoking on vertical periodontal bone loss was conducted by Baljoon et al in Sweden.\textsuperscript{33} The participants in this particular study were considered to have a good oral hygiene as assessed by low plaque and gingival index levels observed both at a baseline and follow up. The study consisted of 24 smokers, 24 former smokers, and 43 non-smokers. Intra-oral radiograph analysis showed that smokers experience a statistically significant increase in the proportion of vertical defects compared to non smokers (p<0.01). There was no difference in the proportion of vertical defects between smokers and former smokers. The study also showed a dose-response relationship between heavy smokers and light smokers. The relative risk of heavy smokers to experience vertical bone loss was significantly higher (OR=5.3; 95% CI: 1.2-24.3) than light smokers (OR=2.3; 95% CI: 1.1-4.9).\textsuperscript{33}

The adverse effect of smoking in periodontal disease has been described in a study conducted by Baharin et al.\textsuperscript{34} The study was carried out to determine the sites pattern of probing depth and bone loss between smokers and non smokers. A total of 39 heavy smokers (smokes ≥ 20 cigarettes a day) and 49 non smokers who experienced moderate
to severe periodontal disease were examined. Both the case and control groups had an age range of 46 to 60 years age. Smokers had a significantly greater proportion of sites with bone loss ≥4.5 mm. The greatest difference of pocket and attachment loss was observed in upper anterior sites, with smokers had 73.3% ± 25.5% sites with bone loss ≥ 4.5 mm compared to non smokers that only had 48.3% ± 31.2% sites with bone loss greater than 4.5 mm (p<0.001).34

Summary

An association between smoking and periodontal disease has been observed in several studies. Numerous epidemiologic studies showed those who smoked experience greater loss of the interproximal bone height, greater mean proximal probing depth, increased risk for attachment loss and experience greater vertical bone loss compared to those who do not smoke. Studies also demonstrated a dose response relationship between heavy smokers and light smokers with periodontal breakdown. Longitudinal studies have demonstrated less favorable periodontal treatment in smokers compared with non-smokers. There is insufficient evidence to support difference between periodontal microbiology of smokers compared to non-smokers.

3.3. Smoking and Dental Implants

Bain and Moy35 conducted the first study to determine the association between smoking and dental implant failure. A cohort study of 540 patients attended the author’s private practice, involving 2,194 implants. Patients were followed over the period of 6 years. Implant failure was defined as a removal of an implant for any cause and or an implant having more than 50% bone loss radiographically. Patients were grouped into a smokers and non smokers group. The overall implant failure rate was 5.92%. Smokers experienced significantly greater implant failure compared to non smokers (11.28% versus 4.76%, p<0.001) over a 6-year period. Smokers experienced significant higher failure rate in all regions of the mouth except for the posterior mandible. The highest prevalence of implant failure occurred in the posterior maxilla, and the anterior mandible showed the best performance.35
Bain\textsuperscript{36} conducted a prospective study to investigate the benefits of a smoking cessation protocol for implant longevity. The study was carried out in the author's private practice, comprised of 223 implants that were placed in 78 patients. A smoking cessation protocol was used on patients who smoked and consented to try to quit smoking. Patients were divided into three groups: (1) non-smokers; (2) smokers who quit 1 week prior and 8 weeks after initial implant placement; (3) smokers who continued to smoke. Implant failure was defined as a removal of an implant for any reason and/or an implant that experienced more than 50% bone loss radiographically. The author found a statistically significant difference in the proportion of implant failure in the smokers group compared to the non-smokers group (5.68% versus 38.5%, \( p < 0.005 \)). There was also a statistically significant difference between the failure rate in the quit group and the smokers group (11.76% versus 38.5%, \( p < 0.05 \)). No significant differences were found between non-smokers and the quit group. All implant failures occurred prior to the loading of the prosthetic component. Smoking cessation conferred considerable value in improving the implant success rate for recent quitters; however, further research with a larger sample is needed to verify this matter.\textsuperscript{36}

Lindquist et al conducted a study to examine the possible risk of smoking and other factors on bone loss around mandibular implants.\textsuperscript{37} Data were collected from 45 edentulous patients involving 266 implants. The group of study consisted of 21 smokers and 24 non-smokers. The outcome measures of osseointegrated and bone loss level was analysed through intra oral radiographs that were performed at the time of insertion of the fixed prosthesis and were followed from 1, 3, 5 to 6 and 10 years thereafter. During the 10-year study period, the mean marginal bone loss around the mandibular implant was very small, around 1.0 mm. Smokers had significantly more marginal bone loss, as large as double that of non-smokers, with the difference reaching a mean of about 0.6 mm (\( p < 0.001 \)). Among the smokers, those who had poor oral hygiene experienced greater marginal bone loss than those that maintained good oral hygiene (\( p < 0.001 \)). Even though the difference of marginal bone loss was significant for the smokers group, it did not lead to implant loss. Over a 10-year period, only 3 implants (1%) were lost, neither of them was in smokers. The authors argue that the implants were probably lost due to trauma.\textsuperscript{37}
Lambert et al conducted a study to evaluate the effect of smoking to dental implants failure.\textsuperscript{38} The study was carried out at the Dental Implant Clinical Research Group (DICRG) of the Department of Veterans Affairs (DVA). It comprised of 800 patients and almost 2900 endosseous dental implants at 30 DVA and two dental schools. After implant placements, all patients were followed up to three years. The sample was divided into two groups: (1) smokers group and (2) non smokers and recent quitter group. Implant placement was divided into four stages: (1) the stage between implant placement and uncovering; (2) the time of uncovering; (3) before prosthesis insertion; (4) after prosthesis insertion. The smokers group showed significantly greater implant failure than combined non smokers and recent quitters group, the risk was almost 1.5-fold. Smokers experienced greater implant failure in stage three (before prosthesis placement). It was argued that smoking has a statistically significant detrimental effect on dental implants by compromising all stages of the implant treatment and by disturbing bone and tissue capacity for adopting the dental implants. To reduce the risk of implant failure, the study found that smoking cessation, the use of Hydroxyapatite (HA)-coated implants and preoperative antibiotic might reduce implant failures among smokers.\textsuperscript{38}

Chuang et al conducted a retrospective cohort study to determine the risk factors associated with dental implant failure.\textsuperscript{39} The cohort consisted of 677 patients that had \( \geq 1 \) implant placed at the teaching facility Implant Dentistry Centre at Faulkner Hospital, Boston, MA. There were 2349 implants in total. The mean age of the patients was 53.1 ± 13.8 years, and 50.4% were women. The mean duration of follow up was 23.8 months and the indicator of implant failure was not implant loss but primarily inflammatory (e.g. mobility, pain, infection, or peri-implantitis). The study indicated that besides the characteristic of the implant such as immediate implant, implant length, well size and implant staging, tobacco use was one of the identified causes of implant failure. Current tobacco use was found to carry three times more risk of an implant failure (OR=3.1 CI 1.7-5.5, \( p<0.01 \)).\textsuperscript{39}

During the period of 1988 to 1992 Roos-Jansker et al (2006) conducted a longitudinal study at the Public Dental Health Service in Kristianstad County, Sweden to find the cause of implant loss.\textsuperscript{40} In the cohort study of 218 patients with 1057 implant
placements; all patients received standardized pre and post treatment procedures. A recall examination was carried out at 1 and 5 years after the prosthesis placement. The data was based on final clinical and radiographic examinations at 9-14 years after implant placement. The outcome measure was implant loss. During the observation period, a total of 46 implants (4.4%) were lost in 22 patients. Sixty three percent of implants were lost during the initial healing phase ("early stage"). Even though the study demonstrated a deleterious effect of smoking on implant loss, the relationship was not significant. The authors argued that the small number of patients might be the reason for the insignificant difference.\textsuperscript{40}

Roos-Jansker et al expanded their research to investigate factors associated with peri-implant lesions.\textsuperscript{41} The setting of the study was exactly the same as the above study. The study showed that patients who smoked experienced significantly more mucositis, peri-implantitis, and had more advanced bone loss around implants than non smokers.\textsuperscript{41}

Hinode et al performed a meta-analysis on the influence of smoking on dental implant failure.\textsuperscript{42} The inclusion criteria were all case control and cohort studies that examined the risk factors of smoking for dental implant failure. Implant failure was defined as implants that had been removed regardless of any reason and showed progressive bone loss radiographically. There were 12 case control and seven cohort studies which met the inclusion criteria in this meta-analysis. For all study designs, smokers were twice as likely to have implant failure as non-smokers (OR=2.17; 95% CI: 1.67-2.83). There was no statistically significant difference between the risk for experiencing implant failure between smokers and non-smokers when the analysis was divided into subgroups in the year of publication (before and after 2000); number of cases (less and more than 200 cases); and implant failure rate (less and more than 10%). The meta-analysis also compared the prevalence of implant failure between the maxillary and mandibular arch. Seven studies met the inclusion criteria. Among people who smoked the likelihood to have implant failure in the maxillary arch was increased by 2-fold compared to non-smokers (OR=2.06; 95% CI: 1.61-2.65). No statistically significant risk for the mandibular arch was found.\textsuperscript{42}
Summary

Implant failures have been defined as any removal of implant and/or an implant experience of more than half bone loss radiographically. Other studies have defined implant failures as the occurrence of peri-implantitis lesions and advanced bone loss around dental implant. Regardless of definitions of implant failures, smoking has been shown to have a detrimental effect on the successfully osseointegrated dental implant. Meta-analysis showed that smokers were twice as likely to have implant loss and progressive bone loss radiographically as those who did not smoke. Failure rates in the maxillary arch were significantly different between smokers compared to non smokers. Smoking cessation was found to demonstrate significant benefits in improving implant success rate.

4. The Effect of Oral Health Promotion Campaigns

Rise and Sogaard conducted an evaluation of an oral health campaign in Norway. The dental campaign was focused on periodontal disease and launched by the Norwegian Dental Association in 1981, popularly called the “Perio Year”. Dentists received a periodontal course and training as part of the campaign strategy, while a mass media campaign was launched to increase public awareness of periodontal disease. The mass media campaign contained a booklet with a guidance to maintain good oral hygiene, and use advertising media such as Radio, TV, Norwegian Newspaper, and a few weekly printed articles about periodontal disease. The evaluation of the campaign was in four phases. The first phase was carried out prior of the campaign in February 1981. The after campaign evaluation was in 1982, 1983 and 1985. Results of the mass-media periodontal campaign in Norway showed an increase of public knowledge of periodontal diseases, even though only the most simple knowledge message that “Periodontal diseases are prevented by improved brushing” seemed to have reached the public. The campaign did not prove to have a specific effect of behaviour change such as the increase of daily use of dental floss and toothpicks.

Schou conducted a qualitative study to evaluate a national dental health campaign conducted in Scotland in 1984. The aim of the campaign was to increase knowledge
and awareness of dental health. The campaign used three different materials: 1. inserts in women’s magazines; 2. television commercial; 3. a package of dental materials distributed at school. The target groups of the campaign were 5-7 year old children and their mothers. The main outcome measures were decreased sugar intake and an increase in tooth brushing frequency. The result showed that dental materials for home use distributed at school which needed active involvement from the participants, had the largest impact compared to passive materials such as television commercial and the magazine insert. It was suggested that the combination of active and passive activities will stimulate behavioral changes.\(^{44}\)

Kay and Locker reviewed quantitative and qualitative research on the effectiveness of dental health education programs.\(^{45}\) They reviewed research conducted between 1982 to 1994 on: 1. research on plaque and gingival health; 2. research on reducing caries level; 3. research of dietary change; and 4. research aiming to improve knowledge and attitudes. Restricted criteria were applied for each study to be included in the review. There were 37 studies included in this qualitative review and 7 randomized controlled trials were included in a meta-analysis. The review indicated that knowledge can be improved through dental health education but that health education did not lead to behaviour change or caries risk reduction. The reviewers found some indications in the literature that “the most successful dental health interventions are time and labour intensive and likely to be costly”.\(^{45}\)

**Summary**

Oral health education was shown to improve dental knowledge however it did not lead to any improvement in gingival health nor reduce caries levels. Multiple interventions are needed to make behaviour changes.

### 5. Smoking Cessation in Dental Clinics

Cohen et al conducted a randomized controlled trial in 44 private dental practices in Indianapolis.\(^{46}\) The participant surgeries were randomly assigned to one of four groups that had different approaches in giving smoking cessation to their patients. Group one
served as a control group (n=13) that gave brief counseling to their patients. The other three groups gave a brief counseling in combination with other intervention. Group two used nicotine gum to help their patients quit smoking (n=9), group three had a reminder cessation chart for their patients (n=10), while group four used both nicotine gum and reminder cessation chart (n=12). All the dentists had received a cessation lecture and a smoking cessation protocol before starting the study to assist them when providing smoking cessation advice. The study showed that the combination of personal smoking cessation counseling in dental practices with free prescription of nicotine gum and chart reminders to adult patients can increase the likelihood to quitting smoking. Compared to a control group who only had counseling cessation, the group which had a combination of nicotine gum and reminder chart showed more than double confirmed success rates after one year. The authors also concluded that the greater the number and methods of intervention, the greater the chance for the patient to quit smoking.\textsuperscript{46}

Campbell and MacDonald conducted a large survey among the dentists registered to the Alberta Dental Association (n=1384).\textsuperscript{47} A self-administered questionnaire was used to assess dentists’ attitudes, behaviour and perceived barriers to smoking cessation activities. The response rate was 64.0 per cent (n=765). Almost all dentists stated that they should be a good example to their patients by not using tobacco (93.0\%) and having a smoke-free workplace policy (94.4\%). Fewer indicated that they had to try to convince patients (73\%) or actively help them to quit smoking (63\%). A higher proportion of the dentists discussed the health risk of smoking and the benefit of quitting to their patients as part of tobacco counseling activities than other cessation strategies. The dentists also reported being more likely advise patients to cut down their smoking rather than to quit smoking completely. The four most common obstacles to tobacco counseling activities were lack of coordination between dentistry and quit line services, lack of patients motivation to quit smoking, a need for further training and a belief that smoking cessation was not their high priority.\textsuperscript{47}

John et al surveyed general practitioner dentists in the Oxford region of UK.\textsuperscript{48} The aim of the study was to investigate the dentists’ attitudes toward smoking cessation activities. Eight hundred and sixty nine dentists registered in the Oxford region were sent the
questionnaires; of these, 674 (78% response rate) participated. The majority of the
dentists believed that they should encourage their patients to quit smoking (82.0%;
95%CI: 79-85); however, only 37% (95%CI: 34-41) were confident that their advice
would help their patients quit smoking. Only a small proportion of dentists recorded their
patients’ smoking status (18.0%; 95%CI: 15-21) and discussed smoking with patients
who smoked (17.4%; 95%CI: 14.6-20.3). Furthermore, few of them discussed smoking to
patients who did not have oral health problem (9.0%). Half of them discussed smoking if
patients had periodontal problem (51.0%). Lack of time and training, and a fear that
smoking cessation activities would affect the dentist-patient relationship were not
perceived as barriers to providing smoking cessation advice.48

More recently, Simoyan et al surveyed dentists who belonged to the New York State
Dental Association to determine their opinion, attitudes, and perceived barriers to tobacco
cessation services.49 The sample comprised of 364 dentists included general
practitioners, oral surgeons and peridontists. Seventy eight dentists were removed from
the study due to undeliverable questionnaires or because they were no longer in practice.
The methods they used were the long questionnaire and the postcard. However, since
only 46 dentists returned the postcard survey. their results were also excluded from
analysis, giving a total response rate of 51.1% (n=318). The dentists’ attitudes and
opinion toward tobacco cessation services varied. Seventy two percent of them agreed
that dentists should encourage tobacco users to stop. However, even more believed that
most of the patients would not stop using tobacco if the dentists ask them to do so (78%)
and the addiction to nicotine was the reason causing difficulty to quit smoking (88.9%).
Perceived barriers to tobacco services included lack of confidence, patient resistance,
lack of knowledge of where to refer a tobacco user patient, inadequate reimbursement
and lack of time.49

Kentala et al conducted one large well designed study on adolescent smoking in Finland.50
A total of 2,586 young people (12 years old) participated in this two year longitudinal
study. The participants were dental patients who were asked to complete a smoking
questionnaire. They were then randomly assigned to either the control or intervention
group. The intervention group received brief smoking cessation advice and were provided
with information on the harmful effects of smoking on oral health through a leaflet. They also received a video highlighting the benefits of quitting smoking and photographs of the adverse effects of smoking. After 2 years follow up, there was a difference in smoking prevalence between the intervention group and the control group, 18.1% and 20.8% respectively, however, the difference was not significant. A brief counseling session through community dental clinics in this study did not show have a significant effect in making adolescent patients quit smoking. This is a very important study as it shows cursory advice does not work. 50

Severson et al conducted a randomized clinical trial using a dental hygienist to deliver a tobacco cessation program. 51 The study was conducted in 75 private dental practices in Oregon. They developed two smoking cessation protocols, one for cigarette smokers and another for smokeless tobacco users. Study participants were randomly assigned to 3 intervention groups. The first group received Usual Care intervention, the second received Minimal Intervention and the third used Extended Intervention. In the Usual Care group, the hygienists did not receive training and treated the patients in the usual manner. It was assumed that all of them would give smoking cessation advice to their patients. In addition to three hours of a smoking cessation workshop for the other two groups, the Minimal Intervention group received a smoking information pamphlet and a quit kit to be delivered to their patients. The Extended Intervention group received a smoking cessation video, were helped to set the quit date and were given a follow up call after 2 weeks of intervention. Assessments were carried out after 3 and 12 months follow up. There were 4,761 patients enrolled in this study and the response rate was 75.7 per cent (n=3,603). Of these, 3,068 were cigarette smokers, 469 were smokeless tobacco users and 66 both smoked cigarettes and used smokeless tobacco. The study indicated that patients who received Minimal and Extended Interventions were significantly more likely to quit using smokeless tobacco. The study indicated that neither intervention helped cigarette smokers to quit smoking. The odds for Minimal Intervention group to Extended Intervention showed unfavorable trends towards cessation success (OR= 0.90; 95 % CI: .68-1.80). While the Usual Care group to both interventions had OR=1.11, 95% CI: 0.72-1.71. However, cigarette smokers in the Extended Intervention group were
significantly more likely to make a quit attempt at 12 months follow up (p<0.01) and to be thinking of quitting in the next 30 days (p<0.01) than those in the Minimal Intervention group. The authors provided several possible explanations why interventions among cigarette smoking patients showed unfavorable outcomes. These are due to (1) cigarette smokers are constantly exposed by health messages and restrictions on their smoking habit than smokeless tobacco users which makes them more resistant to smoking cessation activities, (2) dental health professionals are more comfortable with and have more confidence in their ability to give smoking advice to smokeless tobacco users than to cigarette smoker patients and, therefore, they give more salient interventions to smokeless tobacco users.  

Smith et al conducted a randomized controlled trial to investigate the effectiveness of smoking cessation advice in dental practices. The study involved 54 dental practices in the United Kingdom; however, only 22 dental practices were able to recruit patients in the smoking cessation program. Dental practices were supplied with comprehensive smoking cessation learning material to help them deliver smoking cessation advice to their patients. Every dental practice aimed to recruit 25 patients, however only 2 dental practices were able to meet this target. There was a variance between the numbers of patients recruited in every dental practice; in total 154 smoker patients agreed to participate. Each patient received brief counseling from their dentists; nicotine patches were made available on request and were followed up to 9 months. A saliva test to measure cotinine which is a metabolite of nicotine found in body fluids of regular smokers was conducted at the initial examination, followed at 9 months thereafter. Phone calls and reminder letters were made at 1, 3 and 6 months to maintain compliance. The compliance was very low; only 74 patients followed the 9 months program. Based on the salivary test, 17 patients quit with a total quit rate of 11%. Seven out of 17 smoker patients who gave up smoking admitted it was due to the support and advice of dental team. Another 10 smoking patients admitted that the combination of dental team effort and the availability of nicotine patches were important factors assisting them to quit smoking. The authors argued that motivated dentists and the dental team are able to assist patients to quit smoking.
Rikard-Bell and Ward conducted a questionnaire survey among 149 dental practices in Central Sydney Australia.53 The aim of the study was to determine the dentists’ attitudes toward smoking cessation activities. The majority of dentists acknowledged the risk of smoking to oral health. Compared to dentists who graduated after 1980, those who had graduated before 1980 were less likely to acknowledge that smoking was a risk factor for oral cancer (adjusted OR=0.3; 95%CI: 0.1-0.0)(χ² =4.87, df=1, p=0.03). The majority of dentists agreed that smoking cessation activities were part of their role as health professionals (n=105, 70); however, nearly half of them perceived that their patients did not share the same view (n=64, 43%). Most dentists did not agree that lack of time was the barrier to the provision of smoking cessation advice to their patients (n=103, 69%). Only few dentists always asked their patients’ smoking status. A higher proportion of dentists who followed a strategy explained to their patients about the health effects of smoking on oral health than any other smoking cessation strategies. It was also reported that dentists were more likely to advise their patients to cut down the frequency of smoking than to advise them to quit completely. The dentists reported that they preferred giving self-help quit smoking pamphlets to their patients than implementing cessation strategies that required their direct involvement.53

Rickard-Bell et al surveyed dental patients’ views regarding smoking cessation advice from their dentists.54 The study was conducted in 153 dental practices in the region served by the Central Sydney Area Health Service and involved 2,451 dental patients. After having been assessed for eligibility, the number of the sample reduced to 1,442 eligible patients and of these 1,160 patients agreed to participate. The majority of participants were regular patients. Dental patients were asked to complete first ("pre-consultation") questionnaires at their dental visit and second ("post-consultation") questionnaires were mailed to them within one week of their visit to the dentists. From 1,160 patients who completed the first questionnaires, 849 (73%) agreed to have the second questionnaires mailed to them and of these 623 (73%) returned these to the researchers. The pre-consultation questionnaire consisted of questions assessing basic demographics, utilization of dental service, patients’ knowledge of the health risk of smoking to general and oral health, smoking status of patients and household members,
stage of change, previous quit attempt, and patients' views toward smoking cessation advice from their dentists. The post-consultation questionnaire addressed patients' experience toward smoking cessation after their last dental visit. Smoker patients counted as 26% from the whole sample. The study showed that fewer patients knew that smoking causes oral cancer than lung cancer (McNemars $x^2=126.55$, df=1, $p<0.001$) or heart disease (McNemars $x^2=196.55$, df=1, $p<0.001$). The majority of dental patients said that they would not change dentists if asked about their smoking status (61%), and also expected their dentists to be interested in their smoking status (73 %, 95% CI: 70%-76%) and to discuss smoking with them (61%, 95% CI: 59%-64%). However, smokers had a low expectation that their dentist would discuss (17%) and help (23%) them to quit smoking during dental visits. Thirty per cent of smokers agreed to try to quit if their dentists advised them to do so. From post-consultation questionnaires, it was found that only 117 (19%) dental patients recalled that their dentists asked their smoking status. The study reported a higher proportion of smokers recalled to receive advice from the dentists that smoking can do harm to their oral health than advice to quit smoking (McNemars $x^2=8.52$, df=1, $p<0.01$). It was also reported that a low proportion of smokers recalled having specific smoking cessation advice from their dentists.54

Carr and Ebbert systematically reviewed the literature on the role of dentists in delivering cessation advice to cigarette smokers and smokeless tobacco users.10 The review only included well designed studies that reported tobacco use outcomes with at least six months of follow up. Six randomized and pseudo-randomized controlled trials met the inclusion criteria. Five of these studies related to smokeless tobacco use and only one related to giving smoking cessation advice to cigarette smokers. With only a few randomized and pseudo-randomized studies conducted on smoking cessation in dental offices, it was concluded that dentists may be effective only to get smokeless tobacco users to quit. The review revealed that smoking cessation for smokeless tobacco through dental offices made tobacco users almost one and half times more likely to quit smokeless tobacco (OR=1.44; 95% CI: 1.16-1.78). However there is insufficient evidence to support the effectiveness of dentists providing cessation interventions for cigarette smokers.10
Summary

Studies showed that the majority of dentists believed that smoking cessation activities should be part of their role as health professional, however few of them reportedly deliver it to their patients. On the other hand, dental patients expected to discuss smoking with their dentists. Few dentists used specific smoking cessation interventions, and were as likely to use advice such as to cut down as opposed to quitting completely. It was perceived that patients’ lack motivation to quit, while for dentists the need for training in quit advice, lack of time, inadequate reimbursement, and lack of coordination between dentistry and cessation services were perceived as barriers. Randomized controlled trials in the USA and the UK showed that the dentist and dental team might have a potential role in delivering smoking cessation activities to their patients. Motivated dentists and dental teams are able to help patients to quit smoking. The combination of brief counseling, chart reminders and nicotine replacement therapy has been shown to double the cessation rate one year after smoking cessation interventions. Brief counseling alone does not successfully help dental patients to quit smoking. One study showed that interventions consisting of brief advice, leaflets, video and photographs of the adverse effect of smoking on oral health were ineffective in reducing adolescent smoking rates. Interventions that needed both direct involvement from dentists and patients were proven to be more effective. Due to lack of well designed studies, a Cochrane review indicated that there was insufficient evidence to support the effectiveness of dentists to provide smoking cessation activities for cigarette smokers. This finding is not encouraging. Further randomized controlled trials to investigate the effectiveness of dentist to delivering smoking cessation advice to their cigarette smokers patient is required.
References


10. Carr AB, Ebbert JO. Interventions for tobacco cessation in the dental setting. The Cochrane Database of Systematic Reviews 2006;Art. No: CD005084.pub2. DOI: 10.1002/14651858. CD005084.pub2.(1).


PART 2

Patient demand for smoking cessation advice in dentist offices after introduction of graphic health warnings in Australia
Patient demand for smoking cessation advice in dentist offices
after introduction of graphic health warnings in Australia

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Running Title: Patient Demand for Smoking Cessation Advice

Key words: Anti-smoking campaign; health education; smoking cessation; dentists; health services research.

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Abstract

Background: The effectiveness of smoking cessation intervention by dentists has not been conclusively established. This study aimed to investigate whether the inclusion of graphic health warning pictures (including mouth and throat cancer) as part of the Australian National Tobacco Campaign strategy would elicit measurably increased demand for smoking cessation advice in dental practices.

Methods: A cross-sectional survey in private dental practices in New South Wales, Australia. Separate questionnaires were answered by dentists and patients from their practice. Questions comprised smoking practices and attitudes toward smoking cessation activities in dental practice.

Results: The majority of the dentists (85.7 per cent, n=29) and of dental patients (92.4 per cent; n=800) recalled seeing the graphic health warnings, with the mouth and throat cancer the most commonly observed. Television was the main medium. Nineteen per cent of dental patients (n=152) reported themselves as current smokers. Half of them were planning to quit within six months (49.7 per cent) and agreed that graphic health warnings made them more likely to quit (47.7 per cent). Dentists showed positive attitudes toward cessation activities, but perceived as the main barrier to offer smoking cessation advice that many patients lacked motivation to quit smoking. Forty per cent of smokers would try to quit if asked by the dentists, but only 28.4 per cent preferred a dentist for cessation advice. In general, dentists found no change in demand for smoking cessation advice since the launch of the National Tobacco Campaign in 2006.

Conclusion: Health warning pictures seemed to increase the patients’ awareness and intention to quit smoking, however it did not appear to generate more demand for smoking cessation advice from their dentists. Dentists had low expectations about their patients’ motivation to stop smoking.
Introduction

Tobacco use together with obesity are the main two overarching risk factors for chronic diseases including cancer, heart disease, chronic respiratory diseases and diabetes.\(^1\) Despite Australia having one of the lowest smoking prevalences in the world tobacco use is still a major preventable cause of premature death and of many diseases here.\(^2\) Over a period of 20 years, smoking prevalence in Australia has declined from 35 per cent in 1980 to 22 per cent in 2001 due to an extensive tobacco control strategy \(^3\) featuring higher tax and pricing of tobacco products, ban of tobacco advertising, the availability of pharmacotherapy for treating tobacco dependence, and non smoking legislation in public places.\(^4\) In June 1997 the National Tobacco Campaign (NTC) was launched collaboratively between Federal and State/Territory jurisdictions and related non-government organizations.\(^5\) Graphic cigarette warning labelling was one educational strategy of the NTC to educate smokers about the health risks of smoking. Obstructive strategies by tobacco manufacturers caused major delays in the implementation of the warnings and in keeping them inconspicuous, attributed to the industry and non-specific, and particularly in delaying the use of warnings about addiction.\(^6\) The Australian Government approved new health warnings for cigarette and cigar packages in June 2004. Replacing the text-only warning messages, a graphic health warning combined with health risk information and carrying the Quit line service details was introduced. From 1 March 2006, tobacco products manufactured in or imported into Australia were required to be printed with the new graphic health warning comprising 14 graphic images divided into part A and B which are rotated every year.\(^7\) For the first time, graphic health warnings in the NTC campaign include oral health related diseases. As an
example, the picture of a mouth and throat cancer is displayed as one of the part A
graphic warning set, Figure 1a and 1b.

Figure 1a and 1b. Front and back of dummy cigarette pack with graphic health warning
against tobacco smoking illustrating one of the 14 warnings used in the National Tobacco
Campaign depicting mouth and throat cancer. © Department of Pathology, The University of
New South Wales, Sydney, Australia, 2006 (Image) and Commonwealth of Australia (Text).
As at 14 August 2007, the above image was required by law to be placed on retail packages
of tobacco (warning must occupy 30% of the front and 90% of the back of the pack).
There is overwhelming evidence that tobacco can cause harmful effects on oral health. Tobacco is considered to be a risk factor for periodontal disease and for compromising periodontal treatment, it is also a significant risk factor for precancerous lesions and oral cancer, and causes failure of dental implants. Tobacco has also been linked to aesthetic problems with discoloration both of teeth and dental restorations and causing halitosis.1,8 With 60 per cent of adult Australians reporting that they have seen a dentist within the last 12 months9 dentists should have a unique opportunity to deliver smoking cessation advice opportunistically to their patients. A recent systematic review based on six randomized and pseudo-randomized controlled trials with at least six months of follow up assessed the effectiveness of interventions for tobacco cessation offered to cigarette smokers and smokeless tobacco users by oral health professionals in the dental office or community setting. The authors concluded that behavioural interventions for tobacco use conducted by oral health professionals incorporating an oral examination component in the dental office and community setting may increase tobacco abstinence rates among smokeless tobacco users. However, differences between the studies limit the ability to make conclusive recommendations regarding the intervention components that should be incorporated into clinical practice.10

The present study aimed to examine the impact of the new graphic health warnings on adult smoking behavior and patient demand for cessation advice in dentist offices. The specific research questions explored whether

1. patients and dentists were able to recall exposure to the graphic health warnings,
2. patients' smoking behaviors and their attitudes to selected smoking and cessation
issues were conducive to smoking cessation in response to the health warnings or
by being encouraged by dentists and other health professionals, and
3. what the dentists' behaviors and attitudes were in relation to their patients'
smoking behaviors as well as patient attitudes and expectations

Material and methods

The study protocol was reviewed by and received ethics clearance from the University of
Sydney Human Research Ethics Committee.

A questionnaire survey was conducted among dentists and their dental patients in
New South Wales (NSW), Australia. The recruitment of dentists was done from the
period of July to September 2006. A joint invitation letter from Australian Dental
Association Ltd. NSW branch (ADA) and the Faculty of Dentistry, University of Sydney,
was delivered to all registered dentists in NSW explaining the aims and the method of the
survey. The first invitation letter was delivered by email in July 2006, followed by an
insert in ADA NSW bulletin in August 2006 edition. The final mailing was sent in
September 2006 to randomly selected dentists (n=615) in NSW. Dentists from 51 dental
practices responded with a consent to participate in the survey. These practices were sent
two sets of questionnaires in October 2006. It comprised of a questionnaire for the dentist
and 40 dental patient questionnaires, which were expected to be completed by sequential
patients in the practice within two weeks. An information letter was inserted to help the
dental team to recruit the patients. Patients were considered eligible if they were above 18
years of age and were physically and mentally able to answer the questionnaire, and did
not have a language barrier. Both dentist and patients were given a participant information statement and were required to sign the consent form before completing the questionnaires.

Telephone contact with the dental practice was undertaken one week after the questionnaire delivery to ensure that the questionnaires were received and that the staff was certain of how to secure patient and dentist responses. Reminder letters were sent to non-responders in November 2006. The final recruitment of the dentist and dental patients were stopped in mid December 2006.

The questionnaire for the dentist comprised nine questions: Basic demographic characteristics (gender, year of graduation) and smoking status; practice characteristics (general or specialist dentist); awareness about the graphic health warning; increase in demand for smoking cessation since the launch of NTC; eight smoking cessation strategies focusing on the frequency with which certain activities were undertaken with the patient, e.g. ‘Ask all patients about their smoking status’ and ‘Provide written anti-smoking information to smokers (response items were measured on five-point Likert scales ranging from always to never); perceived barriers to giving smoking cessation advice in their routine practice (comprised of six items measured on five-point Likert scales ranging from strongly agree to strongly disagree); and agreement with the effectiveness of NTC to make dental patients quit smoking.

All consenting patients were asked ten questions comprising basic demographic characteristic (gender, year of birth, employment status, and highest education qualification); dental utilization; smoking status; awareness of health consequences of
smoking, and awareness of health warning pictures. If they were smokers, the following five additional questions were asked: Intention to quit smoking; opinion about the anti-smoking campaign (measured on five-point Likert scales ranging from strongly agree to strongly disagree); how confident they were to successfully quit smoking; attitude towards receiving smoking cessation advice from their dentist. Finally, the smokers were asked to nominate what support person they would use to help them in their quit attempt, doctor, pharmacist, dentist, NSW Quitline, smoking counsellor or other.

**Statistical analysis**

The data for analysis were entered into MS Excel 2003 and then exported to and analyzed using SPSS for MS Windows Version 14.0. Descriptive statistics were generated for dentist and patient socio-demographic and other variables. The major dependent variable among patients was considered to be smoking status, and based on patient responses ‘daily smokers’ and ‘occasional smokers’ were regrouped into ‘current smokers’, whereas those who used to smoke and had tried to smoke a few times but never smoked regularly were regrouped into ‘not a current smoker’. The third group of respondents had reportedly ‘never smoked’. To recognize that the generated summary statistics were derived from a sample of patients the resulting frequencies are reported with the corresponding 95 per cent confidence intervals to express sampling variability taking into account both the variance and sample size. To compare differences in smoking status between different socio-demographic characteristics we fitted a multinomial logistic regression model to smoking status with the group who ‘never smoked’ as the reference category. The odds ratios were calculated as appropriate to illustrate the probability that
a difference existed between the group who never smoked and the current smokers and not current smokers respectively.

On several questions respondents were able to choose more than one alternative. These questions were analyzed using the SPSS multiple response function, which allows calculation of the frequencies based on the total number of responses as well as of the percentage of respondents choosing individual alternatives (per cent of cases).

Results

Background characteristics of dentists and patients

Of the 51 dentists who volunteered to participate, 30 (58.8 per cent) returned the questionnaires and successfully recruited dental patients to participate. One dentist did not complete the dentist questionnaire and was excluded from subsequent analysis. All participating dentists were general practitioners. Of these, 65.5 per cent were males and 34.5 per cent were females. The majority of dentists were non-smokers (62.1 per cent). Almost one third (27.6 per cent) reported that they previously smoked and 10.3 per cent said they had tried a few times but never smoked regularly. The year of graduation ranged from 1968 to 2001. The median length of practice was nine years.

A total of 853 respondents from 30 dental surgeries completed the patient questionnaire. Of these, 53 were excluded from further analysis (12 worked at the dental surgery, 23 only accompanied other patients and 18 did not complete the basic demographic questions). At the end, a total of 800 dental patients were eligible to be included in the data analysis. The number of patients recruited per dentist ranged from 7 to 40. The group of current smokers constituted 19.0 per cent (n=152) of the respondents,
13.5 per cent (n=108) were self reported daily smokers and 5.5 per cent (n=44) were occasional smokers, Table 1.

Compared to women, men had significantly higher odds of being ‘current smokers’ than ‘never smokers’ (OR=1.92; 95 per cent CI:1.29-2.82 in Table 1).

Similarly, the men were almost twice as likely than the women to be ‘not a current smoker’ compared to the ‘never smoked’ group (OR=1.96; 95 per cent CI:1.42-2.71 in Table 1). Participants in the younger age group were more likely to be ‘current smokers’ than those in the oldest age groups (65+ years). However, this trend was not observed in the ‘not a current smoker’ group. Differences were also observed in educational categories with those having less than tertiary education less likely to be ‘never smokers’. Respondents who reported to have a paid job were significant more likely to be current smokers than those who did not have a job (OR=1.82; 95 per cent CI: 1.07-3.08).
Table 1. Socio-demographic characteristics (gender, age, education, and employment status) of patients responding to survey questionnaire in relation to their smoking habits.

<table>
<thead>
<tr>
<th>Subject Characteristic</th>
<th>Current Smoker</th>
<th>Not current smoker</th>
<th>Never smoked</th>
<th>Odds Ratios</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>All subjects</td>
<td>152</td>
<td>19.0</td>
<td>311</td>
<td>38.9</td>
<td>337</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>OR&lt;sub&gt;CS&lt;/sub&gt; (95% CI)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>69</td>
<td>22.0</td>
<td>143</td>
<td>45.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>83</td>
<td>17.1</td>
<td>168</td>
<td>34.6</td>
</tr>
<tr>
<td>Age Group (yrs)</td>
<td>15-24</td>
<td>20</td>
<td>27.4</td>
<td>21</td>
<td>28.8</td>
</tr>
<tr>
<td></td>
<td>25-34</td>
<td>37</td>
<td>31.9</td>
<td>41</td>
<td>35.3</td>
</tr>
<tr>
<td></td>
<td>35-44</td>
<td>29</td>
<td>22.3</td>
<td>47</td>
<td>36.2</td>
</tr>
<tr>
<td></td>
<td>45-54</td>
<td>34</td>
<td>16.9</td>
<td>82</td>
<td>40.8</td>
</tr>
<tr>
<td></td>
<td>55-64</td>
<td>27</td>
<td>15.7</td>
<td>62</td>
<td>36.0</td>
</tr>
<tr>
<td></td>
<td>65+</td>
<td>5</td>
<td>4.6</td>
<td>58</td>
<td>53.7</td>
</tr>
</tbody>
</table>

continued over
Table 1 continued

<table>
<thead>
<tr>
<th>Subject Characteristic</th>
<th>Current Smoker</th>
<th>Not current smoker</th>
<th>Never smoked</th>
<th>Odds Ratios</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;Year 12</td>
<td>54</td>
<td>26.5</td>
<td>80</td>
<td>39.2</td>
<td>70</td>
</tr>
<tr>
<td>&gt;Year 12 or TAFE</td>
<td>63</td>
<td>19.6</td>
<td>133</td>
<td>41.3</td>
<td>126</td>
</tr>
<tr>
<td>Tertiary</td>
<td>35</td>
<td>12.8</td>
<td>98</td>
<td>35.8</td>
<td>141</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paid job</td>
<td>125</td>
<td>21.5</td>
<td>210</td>
<td>36.1</td>
<td>246</td>
</tr>
<tr>
<td>Non-paid job</td>
<td>6</td>
<td>13.6</td>
<td>22</td>
<td>50.0</td>
<td>16</td>
</tr>
<tr>
<td>No job</td>
<td>21</td>
<td>12.0</td>
<td>79</td>
<td>45.1</td>
<td>75</td>
</tr>
</tbody>
</table>

OR<sub>CS</sub> = odds ratio for ‘current smokers’ vs ‘never smokers’.

OR<sub>NCS</sub> = odds ratio for ‘not current smokers’ vs ‘never smokers’.

*p<0.05; **p<0.01, ***p<0.001
Recall of graphic health warnings used in the National Tobacco Campaigns

The majority of dental patients reported that they had seen the health warning pictures of smoking related diseases (92.4 per cent), and respondents reported on an average having seen 1.5 health warnings. The most common picture reported was the mouth and throat cancer (78.2 per cent), followed by foot gangrene (32.2 per cent). Television was recognized as the advertising medium where most respondents had seen the campaign pictures (85.4 per cent) followed by advertising on cigarette packages (51.1 per cent). As illustrated in Table 2, smokers were more aware of the graphic health warnings than non-smokers. For all warnings except the mouth and throat cancer, smokers were significantly more able to recall the warnings and their contents.
Table 2. Proportion of dental patients who were smokers versus non-smokers, who could recall NTC graphic health warning pictures in open-ended responses.

<table>
<thead>
<tr>
<th></th>
<th>Current smokers</th>
<th>Non-smokers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=152</td>
<td>n=648</td>
<td>n=800</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Smoking causes mouth and throat cancer</td>
<td>** ns**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>53.9</td>
<td>56.9</td>
<td>56.4</td>
</tr>
<tr>
<td>Smoking causes peripheral vascular disease</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>36.8</td>
<td>20.1</td>
<td>23.3</td>
</tr>
<tr>
<td>Smoking causes emphysema</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>13.8</td>
<td>5.2</td>
<td>6.9</td>
</tr>
<tr>
<td>Smoking clogging your arteries</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>15.1</td>
<td>1.9</td>
<td>4.4</td>
</tr>
<tr>
<td>Don’t let children breathe your smoke</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>7.9</td>
<td>0.2</td>
<td>1.6</td>
</tr>
<tr>
<td>Quitting will improve your health</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>7.2</td>
<td>0</td>
<td>1.4</td>
</tr>
<tr>
<td>Smoking a leading cause of death</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>6.6</td>
<td>0</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Chi-square: ** = p<0.01; * = p<0.05
Chi-square tests based on absolute numbers.

Patients’ knowledge of general and oral health effect of smoking

A majority of patients showed good knowledge of the risk of smoking for the occurrence of lung and mouth cancer (98.5 per cent and 94.6 per cent respectively). Participant patients also correctly indicated that smoking was a risk factor for the development of lip cancer (87.3 per cent); tongue cancer (84.8 per cent); gum disease (82.0 per cent); and delay wound healing (72.8 per cent). A significantly smaller group of respondents thought that smoking would increase the risk of tooth cavities (n=97; 12.4 per cent).
Dental utilization

The majority of patients (73.5 per cent) reported regular dental attendance classified as a previous dental visit within 12 months prior to the study. There was no statistical difference between smokers and non-smokers (p=0.06). We regrouped the reasons for visit into the three main categories of preventive treatment, restorative services, and emergency services. The majority of the patients came for preventive treatment such as check up, fluoride treatment or to have a scaling and cleaning (71.0 per cent), followed by restorative (45.1 per cent) and emergency treatment (15.9 per cent). There was no statistically significant difference between smokers and non-smokers with regard to reason for the present dental visit (p=0.07), although there was a tendency for a higher proportion of the smokers to report treatment or emergency as the cause for the dental visit.

Smokers’ perception about quitting to smoke and the National Tobacco Campaign

Half of the respondents who smoked, (49.7 per cent) were considering quitting within the next 6 months, whereas 42 per cent had no such intention to quit. Less than 40 per cent of the smokers expressed confidence that they would succeed their intention to quit. Around 46 per cent of the smokers felt that the use of images of mouth cancer in the NTC would increase their likelihood of quitting, but only 38 per cent of the respondents would try to stop smoking if advised so by the dentist. There were no statistically significant differences in these distributions according to gender or age. The weight of the source of advice may be further gleaned from Figure 2, which illustrates that the health professional most likely to be chosen for support for their quit-smoking attempt would be
the doctor, whereas the dentist ranked four of five with only the smoking counsellor ranked lower.

Figure 2. Proportion of respondents who were smokers expressing their preference for which support person they would ask for help to quit smoking.

Dentists' views on the campaign effects

Almost all dentists (85.7 per cent) reported seeing the graphic health warning images being used in the NTC on TV or on cigarette/cigar packages. Of those who reported seeing the graphic health warnings, the image of mouth and throat cancer was the most commonly seen picture. Almost two thirds of the participant dentists (60.0 per cent)
agreed that the current NTC showing images of mouth cancer would increase the likelihood of dental patients wishing to quit smoking. The majority of the dentists reported no change in demand for smoking cessation advice in their dental practices since the launch of the graphic health warnings March 2006 (82.8 per cent) and only a small percentage of the dentists reported a small increase in demand for advice about cessation in their offices (13.8 per cent).

Reported strategies toward smoking cessation

The proportion of patients who were current smokers varied greatly between the dentists, from 3 per cent of the patients to 75 per cent of the patients across the 30 practices. A total of 21 dentists (72.4 per cent) reportedly asked about their patients’ smoking status, less than half of them did that frequently (44.8 per cent) and even fewer did so routinely (27.6 per cent). Only a quarter of the participant dentists reported always to record smoking status of their patients, while a slightly larger proportion (28.6 per cent) stated that they frequently did so. We asked the dentists a range of questions to reflect their smoking cessation strategies with their patients focusing on the frequency with which they would carry out certain practices, ranging from always to never. Figure 3 illustrates these frequencies in descending order. Most dentists always or frequently advised patients on the effect of smoking on oral health (82.8 per cent). However, as illustrated, none of the dentists provided any written anti-smoking information to support this behaviour. Other practices lay between these two extremes as seen in Figure 3.
Figure 3. Dentists’ reported practice behaviours with regard to frequency of smoking cessation advice to their patients. Responses to eight statements distributed according to frequency in terms of always/frequently, unsure, and occasionally/never.

Reported barriers to providing smoking cessation advice

The majority of the dentists disagreed that lack of time or their lack of smoking cessation skills were obstacles to deliver smoking cessation to their patients, Figure 4. However, in the other end of the spectrum there was considerable uncertainty as to whether patients wanted to discuss smoking cessation and a considerable majority of the dentists felt that patients did not want to discuss this issue or did not have the motivation to quit smoking.
Figure 4. Dentists’ reported levels of agreement with statements concerning their expectations to patients’ response to smoking cessation activities in their practice. Proportions of dentists according to agreement, unsure, and disagreement.

Discussion

This is the first study to explore the possible effects of the recently initiated national anti-smoking campaign on smoking cessation activities in dental practices. Besides the general information distributed to health professionals at the start of the national campaign, we did not find evidence of any attempt to link the campaign to organized cessation activities in dental practices. The potential role of dentists to deliver smoking cessation has been addressed in several studies with varying outcomes, mostly rather disappointing.¹¹,¹² One study showed that the combination of a motivated dentist and a dental team using chart reminders and nicotine replacement therapy were able to help
patients quit smoking. Presently, there do not seem to be recommended courses of action for dentists who wish to provide smoking cessation advice to their patients in Australia except the generic strategies designed for all health professionals. In the USA, dentist activities in smoking cessation have been recommended in the National Cancer Institute cancer control objectives, in the US Preventive Service guidelines, and in the year 2000 health objectives. The World Health Organization has also made a concerted effort to encourage the dental profession to include tobacco cessation programs in their activities.

The study does not purport to be representative of all dentists in New South Wales due to the selection bias in the responding dentists. However, of the dentists who indicated an interest in participating 58% responded, which was a response rate similar to Rikard-Bell’s study. Due to the methodology applied there is no way of gauging a response rate for the patients, but the size of the population (n=800) was reasonable and their responses to major variables compared favorably to known major studies. Thus, the gender distribution in the population (more women than men) was typical for studies of dental patients. The proportion who reported dental visits within the last 12 months (73.5 per cent) was higher than the utilization rate reported in the NSW Chief Health Officer’s report (62 percent) and the National Oral Health Survey (59 per cent), which might be expected, since this was a group of respondents who were actually visiting a dental clinic. A formal “before” study was not feasible, but the data from the Chief Health Officer report derived from 2005, prior to the new NTC. The proportion who reported being current smokers (19 per cent, 95 per cent CI: 16.4-21.8) was comparable to the proportion thus reported in the NSW Chief Health Officer’s report (20.1 per cent, 95 per
cent CI: 19-21.1). Similarly, the respondents in this study reflected closely the NSW Chief Health Officer’s (CHO) report about intentions to quit smoking. Where 42 per cent in this study expressed that they did not plan to quit smoking the CHO reported 39.8 per cent did not plan to quit with 95 per cent CI 36.7-42.8.

One of the research questions raised was awareness of the graphic warnings. Clearly, both the patients and the dentists reported a high degree of awareness of the campaign’s graphic warnings (over 90 per cent of patients and over 85 per cent of dentists). Especially, the image referred to by the campaign as mouth and throat cancer was noticed by these respondents, and it was the only image recalled where we could find no significant difference between smokers and no-smokers (Table 2), indicating the oral health focus in this population. Most other images were recalled significantly more by smokers than by non-smokers indicating the evident that if you are a non-smoker you wouldn’t usually handle cigarette packages and be exposed to the images and you wouldn’t pay considerable attention to images on these packages or in advertisements. A survey done in Canada showed that a graphic health warning of mouth and lung cancer was the most effective warning to make smokers attempt to quit smoking.

In general, the anti smoking campaign has proven to be a significant factor to reduce smoking prevalence in Australia. Health warning pictures proved to be very effective by reducing smoking prevalence in Canada. The Australian introduction of health warning pictures in March 2006 has generated a three-fold increase in smokers’ calls to the Quitline service. Although half of the smokers in the study indicated that they intended to quit within 6-12 months a longitudinal methodology would be necessary
to test the veracity of this intention. In a Canadian population, Hammond et al. found that smokers who read, discussed, and thought about the graphic warnings at baseline were more likely to have quit, have made a quit attempt, or reduced their smoking at three month follow up.\textsuperscript{21}

A previous Australian study showed that dental patients demonstrated significantly less knowledge of smoking and oral health than smoking and general health.\textsuperscript{17} In this study dental patients had a good understanding of the adverse effect of smoking on both general health (e.g. lung cancer) and oral health (e.g. oral cancer), possibly due to the inclusion of a mouth and throat cancer image as part of the NTC. It has been found that health warnings on cigarette packages that are graphic, larger, and more comprehensive in content are more effective in communicating the health risks of smoking.\textsuperscript{22}

Explanation about the adverse effect of smoking on oral health was the most common smoking cessation strategy applied by the dentists to their patients. This result reflects previous findings in Australia with patients recalling their dentists explaining to them about the effects of smoking on oral health in a higher proportion than any other advice.\textsuperscript{17} International studies show that very few dentists routinely asked their patients about their smoking status,\textsuperscript{23,24} advised them to quit\textsuperscript{17} or provided specific smoking cessation strategies.\textsuperscript{25,26} Interestingly, the present study showed that dentists express a very positive attitude ("always" and "frequently") when asked whether they advised about the effect of smoking on oral health, asked their patients about smoking status, and advised their patients to quit completely (82.8 per cent, 72.4 per cent and 72.1 per cent
respectively). However, fewer dentists reported to put it in the dental record (53.6 per cent).

A previous survey of Australian dentists indicated that the recommendation to patients to cut down the amount of smoking as a strategy was ineffective, but the present study found that half of the participant dentists still used this strategy. Further, no dentists reported to provide written anti-smoking information despite the availability of anti smoking brochures (e.g., ADA smoking leaflet), while only one dentist reported to frequently refer smokers for follow up smoking counselling. Similar findings were reported in a study on Alberta dentist where very few dentists provided specific anti smoking strategies to their patients.

It has been shown that dentists face a range of barriers for delivering smoking cessation advice to their patients. The main barriers include a concern for patient ability to quit smoking, lack of training in smoking cessation methods, poor collaboration between dentistry and cessation services, insufficient time and no incentives for delivering smoking cessation activities. On the other hand, the majority of patients expected dentists to be more active in providing smoking cessation advice and felt that it would not change their relationship with their dentists. In the present study the majority of dentists did not perceive lack of time and training or fear that smoking cessation activities would alienate or even influence the patient and dentist relationship as a barrier toward smoking control. The majority of dentists (68.9 per cent) did perceive that many patients do not have a motivation to quit smoking as a main barrier.
Forty per cent of current smokers agreed to try to quit smoking if their dentist advised them to do so. However, we found a smaller proportion of the patients willing to get smoking cessation support from their dentist than from their medical doctor; pharmacist and NSW Quitline. While a small proportion of dentists (13.8 per cent) experienced a minor increase in smoking cessation demand since the introduction of graphic health warnings in March 2006, the majority of dentists reported to have seen no change at all in the demand for smoking cessation advice in their dental practices (82.8 per cent).

Conclusions

Bearing in mind that the study may not be generalized to the entire dental population of NSW due to selection bias, the findings supported previous trends. The majority of participant dentists had a positive attitude toward smoking cessation activities, but this only converted to behavioral intervention towards the patients to a limited extent. The dentists perceived the lack of motivation of patients to quit smoking as a significant barrier. The inclusion of oral health related disease information in the anti smoking campaign increased people’s awareness of the adverse effects of smoking on oral health. However, it still did not encourage dental patients to seek help to quit smoking from their dentists. Dental patients reported preferring other health/smoking cessation resources than dentists to help them quit smoking. Thus, there appears to be a mutual misperception in the patient-dentist relationship with regard to smoking cessation activities. This should not prevent dentists from implementing effective smoking cessation activities as outlined in international advocacy guidelines. Further research should be undertaken to explore
an optimum clinical protocol to assist dentists in a practical sense and to help patients
give up smoking and make a significant contribution towards the health of patients and
the public.

Acknowledgements

This research was supported by Australian Dental Association NSW Branch and funded
by a grant from Australian Dental Research Foundation (No.51/2006), which is gratefully
acknowledged. The authors especially wish to thank Dr. Matthew Fisher, CEO of the
ADA NSW Branch, and Dr. Chris Wilson, ADA NSW Branch Immediate Past President,
and ADA staff for support of this project. Thanks to Dr. Glenys Rikard-Bell for her
support in the questionnaire preparation and to Dr. Bradley Curtis and to Dr. Manish
Arora for their statistical and other comments to the manuscript. We gratefully
acknowledge the dentists, dental teams, and patients for their kind willingness to
participate in our study. The scholarship support provided to Dr. Afifah through AusAID
is gratefully acknowledged.
References


27. FDI/WHO. Tobacco or oral health: an advocacy guide for oral health professionals. Edited by Beaglehole RH and Benzian HM; FDI World Dental Federation, Ferney Voltaire, France/World Dental Press, 2005: Lowestoft, UK.
PART 3

Appendices
Appendix A

Copy of Ethics Approval
26 May 2006

Professor E Schwarz
Faculty of Dentistry
Building C12
The University of Sydney

Dear Professor Schwarz

I am pleased to inform you that the Human Research Ethics Committee at its meeting on 9 May 2006 approved your protocol entitled "The effect of a government anti smoking campaign on patient demand for health advice in dentist offices"

Details of the approval are as follows:

Ref No.: 05-2006/1/9130
Authorised Personnel: Professor E Schwarz
                                    Dr R M Aflah

The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Research Involving Humans. We draw to your attention the requirement that a report on this research must be submitted every 12 months from the date of the approval or on completion of the project, whichever occurs first. Failure to submit reports will result in withdrawal of consent for the project to proceed.

The project is approved for an initial period of 12 months with approval for up to four (4) years following receipt of the appropriate report. Your report will be due on 31 May 2007.

Condition of Approval Particular to this Project
Amendment to the Participant Information Statements: Please correct the contact telephone number “9153 934” to read “9153 9334”.

Conditions of Approval Applicable to all Projects

(1) Reporting of Serious Adverse Events

Researchers should immediately report anything to the Human Research Ethics Committee which might warrant review of ethical approval of the protocol, including:

- Serious or unexpected adverse effects on participants;
• Proposed changes in the protocol or any other material given to the participants in the study must be known prior to being actioned, including participant information and consent forms; and
• Unforeseen events that might affect continued ethical acceptability of the project.

(2) Modifications to the protocol cannot proceed until such approval is obtained in writing. (Refer to the website www.usyd.edu.au/ethics/human under ‘Forms and Guides’ for a Modification Form).

(3) The confidentiality and anonymity of all research subjects is maintained at all times, except as required by law.

(4) All research subjects are provided with a Participant Information Sheet and Consent Form, unless otherwise agreed by the Committee.

(5) The Participant Information Sheet and Consent Form are to be on University of Sydney letterhead and include the full title of the research project and telephone contacts for the researchers, unless otherwise agreed by the Committee.

(6) The following statement must appear on the bottom of the Participant Information Sheet. Any person with concerns or complaints about the conduct of a research study can contact the Senior Ethics Officer, University of Sydney, on (02) 9351 4811.

(7) The standard University policy concerning storage of data and tapes should be followed. While temporary storage of data or tapes at the researcher’s home or an off-campus site is acceptable during the active transcription phase of the project, permanent storage should be at a secure, University controlled site for a minimum of seven years.

(8) A report and a copy of any published material should be provided at the completion of the Project.

Yours sincerely

John Watson

Associate Professor J D Watson
Chairman
Human Research Ethics Committee

Cc: Dr Ratu Mirah Affah, Faculty of Dentistry, Westmead Hospital, C24
Appendix B

Participant invitation letter from Australian Dental Association and Faculty of Dentistry University of Sydney
Dear Colleague

Re: Study on the Effect of the Government Anti Smoking Campaign

We are kindly asking you to assist us in a Study on the Effect of the Government Anti Smoking Campaign. You have been randomly selected as one of the dental practice owners in NSW to participate. Please read on.

Some months ago a new government anti smoking campaign was initiated. One of the important features of this campaign is the use of graphic warnings on all packages of tobacco products. In the first series of pictures used oral cancer and severe periodontal diseases are depicted. The evidence based assumption is that the use of dramatic graphics will support the effort to further reduce smoking in the community by showing smokers possible consequences of their behaviour.

A project has been initiated to evaluate whether the use of especially pictures of oral diseases have a specific impact on patients who are seeking dental care and whether dentists experience an increase in the request for information related to smoking. The Branch is extremely pleased to be involved in this project together with the Faculty of Dentistry at The University of Sydney. The Branch is a strong supporter of programs designed to enhance the promotion of oral health and prevention of oral diseases as well as programs that address major health issues with implications for many health care providers and the population as a whole.

During the last couple of years, major health organizations, such as World Health Organization, Federation Dentaire Internationale, American Dental Association, National Institutes of Health, have pointed out the destructive effects of tobacco smoking on oral health in addition to those on general health. Recently, smoking has been called the overarching causative factor for a whole range of lifestyle diseases, including periodontal diseases and oral cancer. Thus, the project addresses a problem that has huge health and economic consequences for the entire health care system.

There has not been a tradition for dentists to provide smoking cessation counselling and this project is not set up as an intervention study with regard to smoking cessation. But the information to be gathered will provide important information for activities that dentists and our Branch may become involved in later by assessing the public response to this government campaign and by assessing the subsequent need for training of dental personnel and strategies for how to include this activity into the undergraduate dental curriculum.

We should like to invite you to participate in this study in the following way.
The effect of a government anti smoking campaign

1. Please respond to ADA (NSW Branch) by fax or email (Fax.no. 8436 9999; email tobacco@adansw.com.au by 22 September 2006.

2. You will be allocated to participate in one out of four weeks in October 2006

3. We will send you an envelope in the week prior to your participation containing
   a) a one-page participant information statement for dentist (a requirement of the University of Sydney Human Ethics Committee, which has approved the study)
   b) an informed consent form for the participating dentist and the patient
   c) a brief dentist questionnaire to be completed by yourself (yellow paper)
   d) a one-page participant information statement for patient to be handed to each patient, who is asked to complete a patient questionnaire
   e) a brief questionnaire (green paper) to be completed by 40 sequential patients during your week of participation. We assume that your receptionist could administer this part of the process as the patient arrives in the clinic.

4. At the end of the week allocated, we ask that you please return the questionnaires in the postage paid envelope that will accompany our initial mailing

Dentist's name:
Contact details:

Response: Yes, I would be willing to participate in this study

No, I am unable to participate

Comments: (optional)

Please fax back to ADA NSW on 8436 9999 or email tobacco@adansw.com.au by 22 September 2006

Thanks for your attention to this.

Should you wish to clarify any matter relating to the involvement of ADA NSW in this project I can be contacted on (02) 8436 9900.

Yours sincerely

Chris Wilson
President,
ADA (NSW Branch) Ltd

Eli Schwarz
Professor and Dean
Faculty of Dentistry, University of Sydney
Appendix C

Letter of Delay
To Dentists who responded positively to the request to participate in the study

THE EFFECT OF A GOVERNMENT ANTI SMOKING CAMPAIGN ON PATIENT DEMAND FOR HEALTH ADVICE IN DENTISTS' OFFICES

Dear Colleague,

The Faculty of Dentistry, University of Sydney, is very grateful for your willingness to participate in the above project. In our first invitation we indicated that you will be allocated to participate in one out of four weeks in July 2006; however, due to unexpected administrative delays we regret that we will not be able to send the questionnaires for you and your patients until September 2006.

We are sorry for any inconvenience.

We are still looking forward to your collaboration and contributions towards a successful outcome of this research. Should you wish to clarify any matter relating to this project please do not hesitate to contact Dr. Mirah Affifah at 0401 196 327.

Yours sincerely

Eli Schwarz
Appendix D

Questionnaire for the dentist
The effect of a government anti smoking campaign on patient demand for health advice in dentist offices.

1. Do you recall seeing the oral health images currently being used in the National Tobacco Campaign on TV or cigarette/cigar packages? *Please tick ONE box only.*

   Yes  □ 1
   No  □ 2

   If yes, what images do you recall? *Please write.*

2. In your opinion, has there been an increased demand for smoking cessation advice in your dental Practice during the last 3 months or since 1 March 2006 as the first day of the launch of graphic health warning? *Please tick ONE box only.*

   Yes, a large increase □ 1
   Yes, a moderate increase □ 2
   Yes, a small increase □ 3
   Unsure □ 4
   No, no change in demand at all □ 5

3. Below is a list of strategies that you may have used with patients who smoke cigarettes. Please rate how frequently you currently use each of the following: *For each strategy tick ONE box in each row.*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Always</th>
<th>Frequently</th>
<th>Unsure</th>
<th>Occasionally</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask all patients about their smoking status.</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Record the smoking status of every patient.</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Give advice on the effect of smoking on oral health.</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Advise smokers to quit completely.</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Advise smokers to cut down.</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Provide brief counseling to smokers based upon their stage of change (motivation to quit).</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Provide written anti-smoking information to smoke.r</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
<tr>
<td>Refer smokers to accredited smoking cessation service for follow up counseling.</td>
<td>□ 1</td>
<td>□ 2</td>
<td>□ 3</td>
<td>□ 4</td>
<td>□ 5</td>
</tr>
</tbody>
</table>

*Please continue on the back of this page.* Page 1 of 2
I do not have the time to give anti-smoking advice.

I do not have the skills to give anti-smoking advice.

I am concerned that the antismoking message may alienate my patients.

I am concerned that the antismoking message may influence my relationship with my patient.

Patients do not want to discuss quitting smoking with their dentist.

Many of my patients do not have the motivation to quit smoking.

**Finally, we would like to ask some background questions from all participating dentists.**

5. Are you?
   - Male
   - Female

6. What is your year of graduation? Please write
   
   [ ] [ ] [ ] [ ] [ ] Year

7. Which of the following best describes your smoking status? Please tick ONE box only
   - I smoke daily
   - I smoke occasionally
   - I’ve tried it a few times but never smoked regularly
   - I don’t smoke now, but I used to smoke
   - I’ve never smoked

8. PRACTICE TYPE:
   - General practice
   - Specialist practice

9. Please rate your agreement with the following statement: In my opinion, the current National Tobacco Campaign showing images of oral lip and tongue cancer will increase the likelihood of my patients trying to quit smoking. Please tick ONE box only
   - Strongly agree
   - Agree
   - Unsure
   - Disagree
   - Strongly disagree

Thank you, you have finished. Please return the questionnaire in the envelope provided.
Appendix E

Questionnaire for dental patient
The effect of a government anti smoking campaign on patient demand for health advice in dentist offices

Firstly, we would like to ask a few questions about yourself as a background for the study

1. Are you? □ Male, □ Female

2. What is your year of birth? Please write ____________ Years

3. In the last week, which of the following best describes your employment status? Please tick ONE box only:
   - Worked for payment or profit
   - Worked for payment or profit, but absent on paid leave, holidays
   - Unpaid work in a family business
   - Other unpaid work
   - Did not have a paid job

4. What is the level of the highest qualification you have completed? Please tick ONE box only:
   - Completed Primary School
   - Did not complete Primary School
   - Completed School Certificate–Intermediate–Year 10–4th Form
   - Completed HSC–Leaving–Year 12–6th Form
   - TAFE Certificate or Diploma
   - University, CAE or some other tertiary institute degree or higher

5. What is your reason visiting your dentist today? Please tick as many boxes as applicable
   - Check up
   - Pain or tooth ache
   - Dental filling
   - Gum treatment
   - Tooth extracted
   - Fluoride treatment
   - Teeth cleaned
   - Whitening–bleaching
   Other (Please write):

6. When did you last visit to your dentist? Please tick ONE box only:
   - Less than 12 months ago
   - One year to less than two years ago
   - Two to less than five years ago
   - Five to less than 10 years ago
   - 10 years ago or more
   - Never

Now, we have some questions about smoking

7. Which of the following best describes your smoking status? Please tick ONE box only:
   - I smoke daily
   - I smoke occasionally
   - I don't smoke now, but I used to
   - I've tried it a few times but never smoked regularly
   - I've never smoked

8. For each of the following statements, please tick ONE box only in each row

<table>
<thead>
<tr>
<th>Statement</th>
<th>Yes</th>
<th>No</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking is a risk factor for the development of lung cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking is a risk factor for the development of cancer of the mouth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking is a risk factor for the development of gum disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking is a risk factor for the development of cancer of the lip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking delays healing of wounds in the mouth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking is a risk factor for the development of cancer of the tongue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking is a risk factor for cavities (holes in teeth)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. During the past three months the Government has started the National Tobacco Campaign using health warning pictures of smoking related diseases. Do you recall seeing any of these pictures? Please tick ONE box only

Yes ☐ 1
No ☐ 2

If yes, what images do you recall? Please write ________________

10. Where did you hear or see these health warning pictures? Please tick as many boxes as appropriate

Magazine ☐ 1
Television ☐ 2
Cigarette packets ☐ 3
Pamphlet/poster/booklet ☐ 4
Billboards ☐ 5
Doctor surgery ☐ 6
Dental surgery ☐ 7
Pharmacy ☐ 8

Other, please write: ____________________

The following questions are only for CURRENT smokers. If you are a non-smoker, YOU HAVE FINISHED.

Thank you for your participation

11. Which of the following best describes how you feel about your smoking? Please tick ONE box only:

I am not planning on quitting within the next six months ☐ 1
I am planning on quitting within the next six months ☐ 2
I am planning on quitting within the next month ☐ 3
I have not smoked in the past 24 hours but was smoking six months ago ☐ 4

12. Please rate your agreement with the following statement: The current National Tobacco Campaign showing images of lip and tongue cancer will increase the likelihood of my trying to make a quit attempt within the next six months? Please tick ONE box only

Strongly agree ☐ 1
Agree ☐ 2
Unsure ☐ 3
Disagree ☐ 4
Strongly disagree ☐

13. Please rate your agreement with the following statement: If my dentist suggested that I quit smoking, I would try to stop? Please tick ONE box only

Strongly agree ☐ 1
Agree ☐ 2
Unsure ☐ 3
Disagree ☐ 4
Strongly disagree ☐

14. If you decided to quit in the next month, how confident are you that you would succeed? Please tick ONE box only

Very confident ☐ 1
Confident ☐ 2
Unsure ☐ 3
Not very confident ☐ 4
Not at all confident ☐

15. Which of the following support persons would you use to help you make this quit attempt? Please tick ONE box only in EACH ROW

Yes No Don’t know

Doctor ☐ ☐ ☐
Pharmacist ☐ ☐ ☐
Dentist ☐ ☐ ☐
NSW Quitline ☐ ☐ ☐
Smoking Counsellor ☐ ☐ ☐
Other Please write ____________________

You have finished. Thank you.

Please place the questionnaire in the envelope provided
Appendix F

Participant information statement for the dentist
The effect of a government anti smoking campaign on patient demand for health advice in dentist offices

Names of Investigators:
Chief Investigator/Supervisor: Professor Eli Schwarz
Student: Dr Ratu Mirah Affah

What is the purpose of the study?
The purpose of the study is to measure the initial effect of a government anti smoking campaign on patient demand for health advice in dentist offices. The study is being conducted to meet the requirements for the degree of Master of Dental Science Community Oral Health and Epidemiology, under the supervision of Professor Eli Schwarz.

Who will be invited to enter the study?
Dentist of the participant dental surgeries will be asked to participate and approximately 30 patients attending each participant dental surgeries will be asked to participate.

What will happen on the study?
You will complete a questionnaire concerning your experience in providing advice and brief counseling to tobacco – using patients.

Confidentiality
The information we collect will be strictly confidential. There will be special code for both dentist and patient, therefore the data will not include your name and could not be identified with specific individual. Only the original investigator as appear above and professional data entry will have access to the collected data. A report of the study may be submitted for publication, but individual participants will not be identifiable in any way.

Do you have a choice?
Your participation in this research is absolutely voluntary and you may withdraw at any time without penalty. This information sheet is for you to keep.

Contact details
If you have any problems while on study, please contact Professor Eli Schwarz. Telephone No. 93518334, fax No. 92115912, or email dean@dentistry.usyd.edu.au
Appendix G

Participant information statement for dental patient
PARTICIPANT INFORMATION STATEMENT FOR PATIENT

The effect of a government anti smoking campaign on patient demand for health advice in dentist offices

Names of Investigators:
Chief Investigator/Supervisor: Professor Eli Schwarz
Student: Dr Ratu Mirah Afifah

What is the purpose of the study?
The purpose of the study is to measure the initial effect of a government anti smoking campaign on patient demand for health advice in dentist offices. The study is being conducted to meet the requirements for the degree of Master of Dental Science Community Oral Health and Epidemiology, under the supervision of Professor Eli Schwarz.

Who will be invited to enter the study?
Dentist of the participant dental surgeries will be asked to participate and approximately 30 patients attending each participant dental surgeries will be asked to participate.

What will happen on the study?
You will complete a questionnaire concerning background information, smoking habits, awareness of tobacco campaign, and health advice sought.

Confidentiality
The information we collect will be strictly confidential. There will be special code for both dentist and patient, therefore the data will not include your name and could not be identified with specific individual. Only the original investigator as appear above and professional data entry will have access to the collected data. A report of the study may be submitted for publication, but individual participants will not be identifiable in any way.

Do you have a choice?
Your participation in this research is absolutely voluntary and you may withdraw at any time without penalty. Whatever your decision, it will not affect your dental treatment or dentist-patient relationship. This information sheet is for you to keep.

Contact details
If you have any problems while on study, please contact Professor Eli Schwarz. Telephone No. 93518334, fax No. 92115912, or email dean@dentistry.usyd.edu.au

Any person with concerns or complaints about the conduct of a research study can contact the Senior Ethics Officer, Ethics Administration, University of Sydney on (02) 9351 4811 (Telephone); (02) 9351 6706 (Facsimile) or gbriody@mail.usyd.edu.au (Email).
Appendix H

Informed consent form
INFORMED CONSENT

The effect of a government anti smoking campaign on patient demand for health advice in dentist offices

I,........................................

1. Have received and read the Participant Information Statement.
2. Was given the opportunity to ask questions and have answered to my satisfaction.
3. Freely choose to participate in this study and may withdraw at any time without penalty.
4. Understand that this study is strictly confidential.
5. Give my consent to take part in this study.

Name of participant........................................

Signature....................................................

Date..........................................................
Appendix I

Information letter to dental staff
INFORMATION LETTER

THE EFFECT OF A GOVERNMENT ANTI SMOKING CAMPAIGN ON PATIENT DEMAND FOR HEALTH ADVICE IN DENTIST’ OFFICES

Dear Doctor and dental staff,

I. We have sent you 1 set of questionnaires for the dentist and 40 sets of questionnaires for the patients. Each set is stapled and consist of one participant information statement, one informed consent form and one questionnaire (yellow color for the dentist and green for the patients).

II. Information for the dentist:
- Please read the participant information statement carefully before completing the questionnaire. Please unattached and keep it for your record.
- Please sign the informed consent form and complete the questionnaire.
- Please enclose the informed consent form together with the questionnaires in the return envelope provided.

III. Criteria to include the patients in this project: they have to be above 18 years of age, do not have a mental or physical disability to complete the questionnaire without any assistance, and understand English clearly without any translator.

IV. Information for dental staff:
- Please ask the patients to read the participant information statement carefully before completing the questionnaire, and ask them to keep the form.
- Please ask the patients to sign the informed consent form and continue with completing the questionnaire.
- Please enclose the informed consent forms and the questionnaires in the return envelope provided.
- Please return all of the questionnaires to Australian Dental Association (New South Wales Branch) Limited, P.O.Box 132, St Leonards, NSW 1590 by 23 October 2006.

Should you wish to clarify any matter relating to this project please do not hesitate to contact Dr. Mirah Afifah at 0401 196 327 (email: maff0033@usyd.edu.au).
Appendix J

Reminder letter to the dentist
October 30, 2006

Dear Colleague,

On the last week of September 2006, following your kind agreement to participate in a joint research project between the ADA and the Faculty of Dentistry, University of Sydney, we mailed a questionnaire for you and a set of 40 questionnaires for your patients. As you may recall, the project is called

THE EFFECT OF A GOVERNMENT ANTI SMOKING CAMPAIGN ON PATIENT DEMAND FOR HEALTH ADVICE IN DENTISTS’ OFFICES

We hope that the active collection of data for this project is well underway in accordance with your acceptance. I wish to emphasize that your contribution is very valuable for the successful outcome of this research. The results depend entirely on the accurate data from you and your patients.

This is a friendly reminder for you to return the already completed questionnaires to the Australian Dental Association (New South Wales Branch) Limited, P.O.Box 132, St Leonards, NSW 1590. If your data collection is still ongoing, please be reminded to return the completed questionnaires, when you are done.

Your immediate attention to this matter is highly appreciated.

Should you wish to clarify any matter relating to this project please do not hesitate to contact Dr. Mirah Afifah at 0401 196 327 (email: maff0033@usyd.edu.au).

Yours sincerely,

Eli Schwarz KOD
Appendix K

Thank you letter to the dentist
November 11, 2006

Dear Colleague,

THE EFFECT OF A GOVERNMENT ANTI SMOKING CAMPAIGN ON PATIENT DEMAND FOR HEALTH ADVICE IN DENTISTS' OFFICES

We would like to inform you that we have got the completed questionnaires from your surgery. We really thank you and your dental staff for your time and thoughtful assistance for the successful outcome of this research.

Each questionnaire is very valuable to us and we shall inform you about the outcome of our study in due course. As you will appreciate, continuing research in smoking cessation and related behaviours will be valuable to inform future health promotion activities. Hopefully, the quality of dentist involvement in giving smoking cessation advice to their patients will be enhanced through the experience gathered here.

On behalf of Dr. Mirah Affifah and the Faculty of Dentistry I thank you once again for participating in this research.

Yours sincerely,

Eli Schwarz KOD
Appendix L

List of variables
CODEBOOK ENTRY FOR QUESTIONNAIRE FOR THE DENTISTS

ID DENTISTS
Value labels: >0 And <51

CODEBOOK ENTRY FOR QUESTION 1
Question 1: Do you recall seeing the oral health images currently being used in the National Tobacco Campaign on TV or cigarette/cigar packages?
Mnemonic: RECALLSEE
Value labels:
- Yes: 1
- No: 2
- Other: 9
Missing value: No answer 99

If yes, what images do you recall? Please write...
Mnemonic: IFYES
Value labels:
- Smoking causes peripheral vascular disease: 1
- Smoking causes emphysema: 2
- Smoking causes mouth and throat cancer: 3
- Smoking clogs your arteries: 4
- Don’t let children breathe your smoke: 5
- Smoking a leading cause of death: 6
- Quitting will improve your health: 7
- Other: 8
Missing value: No answer 99

What other images do you recall?
Mnemonic: IFYES2
Value labels:
- Smoking causes peripheral vascular disease: 1
- Smoking causes emphysema: 2
- Smoking causes mouth and throat cancer: 3
- Smoking clogs your arteries: 4
- Don’t let children breathe your smoke: 5
- Smoking a leading cause of death: 6
- Quitting will improve your health: 7
- Other: 8
Missing value: No answer 99
CODEBOOK ENTRY FOR QUESTION 2
Question 2: In your opinion, has there been an increased demand for smoking cessation advice in your dental practice during the last 3 months or since 1 March 2006 as the first day of the launch of graphic health warning?

Mnemonic: INCDEMAND
Value labels: Yes, a large increase 1
Yes, a moderate increase 2
Yes, a small increase 3
Unsure 4
No, no change at all 5
Missing value: No answer 99

CODEBOOK ENTRY FOR QUESTION 3
Question 3: Below is a list of strategies that you may have used with patients who smoke cigarettes. Please rate how you frequently use each of the following:

Ask all patients about their smoking status
Mnemonic: STRATEGY1
Value labels: Always 1
Frequently 2
Unsure 3
Occasionally 4
Never 5
Missing value: No answer 99

Record the smoking status of every patient
Mnemonic: STRATEGY2
Value labels: Always 1
Frequently 2
Unsure 3
Occasionally 4
Never 5
Missing value: No answer 99

Give advice on the effect of smoking on oral health
Mnemonic: STRATEGY3
Value labels: Always 1
Frequently 2
Unsure 3
Occasionally 4
Never 5
Missing value: No answer 99
### Advise smokers to quit completely

**Mnemonic:** STRATEGY4  
**Value labels:**  
Always: 1  
Frequently: 2  
Unsure: 3  
Occasionally: 4  
Never: 5  
**Missing value:** No answer 99

### Advise smokers to cut down

**Mnemonic:** STRATEGY5  
**Value labels:**  
Always: 1  
Frequently: 2  
Unsure: 3  
Occasionally: 4  
Never: 5  
**Missing value:** No answer 99

### Provide brief counseling to smokers based upon their stage of change (motivation to quit)

**Mnemonic:** STRATEGY6  
**Value labels:**  
Always: 1  
Frequently: 2  
Unsure: 3  
Occasionally: 4  
Never: 5  
**Missing value:** No answer 99

### Provide written anti-smoking information to smoker

**Mnemonic:** STRATEGY7  
**Value labels:**  
Always: 1  
Frequently: 2  
Unsure: 3  
Occasionally: 4  
Never: 5  
**Missing value:** No answer 99

### Refer smokers to accredited smoking cessation service for follow up counseling

**Mnemonic:** STRATEGY8  
**Value labels:**  
Always: 1  
Frequently: 2  
Unsure: 3  
Occasionally: 4  
Never: 5  
**Missing value:** No answer 99
CODEBOOK ENTRY FOR QUESTION 4

Question 4: Please rate your agreement with the following statements.

I do not have the time to give anti-smoking advice
Mnemonic: AGREEMENT1
Value labels:  
- Strongly agree: 1
- Agree: 2
- Unsure: 3
- Disagree: 4
- Strongly disagree: 5
Missing value: No answer: 99

I do not have the skills to give anti-smoking advice
Mnemonic: AGREEMENT2
Value labels:  
- Strongly agree: 1
- Agree: 2
- Unsure: 3
- Disagree: 4
- Strongly disagree: 5
Missing value: No answer: 99

I am concerned that the antismoking message may alienate my patients
Mnemonic: AGREEMENT3
Value labels:  
- Strongly agree: 1
- Agree: 2
- Unsure: 3
- Disagree: 4
- Strongly disagree: 5
Missing value: No answer: 99

I am concerned that the antismoking message may influence my relationship with my patients
Mnemonic: AGREEMENT4
Value labels:  
- Strongly agree: 1
- Agree: 2
- Unsure: 3
- Disagree: 4
- Strongly disagree: 5
Missing value: No answer: 99

Patients do not want to discuss quitting smoking with their dentists
Mnemonic: AGREEMENT5
Value labels:  
- Strongly agree: 1
- Agree: 2
Unsure 3
Disagree 4
Strongly disagree 5

Missing value: No answer 99

Many of my patients do not have the motivation to quit smoking
Mnemonic: AGREEMENT6
Value labels: Strongly agree 1
Agree 2
Unsure 3
Disagree 4
Strongly disagree 5

Missing value: No answer 99

CODEBOOK ENTRY FOR QUESTION NO 5
Question 5: Are you male or female?
Mnemonic: GENDER
Value labels: Male 1
Female 2

Missing value: No answer 99

CODEBOOK ENTRY FOR QUESTION NO 6
Question 6: What is your year of graduation?
Mnemonic: YEAR
Value labels: number

Missing value: No answer 99

CODEBOOK ENTRY FOR QUESTION NO 7
Question 7: Which of the following best describes your smoking status?
Mnemonic: SMOKESTAT
Value labels: I smoke daily 1
I smoke occasionally 2
I’ve tried it a few times, but never smoked regularly 3
I don’t smoke now, but I used to smoke 4
I’ve never smoked 5

Missing value: No answer 99

CODEBOOK ENTRY FOR QUESTION NO 8
Question 8: Practice type
Mnemonic: PRACTICE
Value labels: General Practice 1
Specialist Practice 2
Missing value: No answer 99

CODEBOOK ENTRY FOR QUESTION NO 9
Question 9: *Please rate your agreement with the following statement: In my opinion, the current National Tobacco Campaign showing images of oral lip and tongue cancer will increase the likelihood of my patients trying to quit smoking.*

Mnemonic: OPINION
Value labels: Strongly agree 1
Agree 2
Unsure 3
Disagree 4
Strongly disagree 5
Missing value: No answer 99

LIST OF VARIABLES FOR QUESTIONNAIRE FOR THE DENTISTS:

1. ID1
2. RECALLSEE
3. IFYES
4. IFYES1
5. INCDEMAND
6. STRATEGY1
7. STRATEGY2
8. STRATEGY3
9. STRATEGY4
10. STRATEGY5
11. STRATEGY6
12. STRATEGY7
13. STRATEGY8
14. AGREEMENT1
15. AGREEMENT2
16. AGREEMENT3
17. AGREEMENT4
18. AGREEMENT5
19. AGREEMENT6
20. GENDER
21. YEAR
22. SMOKESTAT
23. PRACTICE
24. OPINION

96
CODEBOOK ENTRY FOR QUESTIONNAIRE FOR THE PATIENTS

ID PATIENT
Value labels: AUTONUMBER

ID DENTIST
Value labels: >0 and ≤ 51

CODEBOOK ENTRY FOR QUESTION 1
Question 1: Are you male or female?
Mnemonic: GENDER
Value labels:
Male 1
Female 2
Missing value:
No answer 99

CODEBOOK ENTRY FOR QUESTION 2
Question 2: What is your year of birth?
Mnemonic: D.O.B
Value labels:
None
Missing value:
No answer 99

Regroup to: AGEGROUP
15-24 years 1
25-34 years 2
35-44 years 3
45-54 years 4
55-64 years 5
65+ years 6
No answer 99

CODEBOOK ENTRY FOR QUESTION 3
Question 3: In the last week, which of the following best describes your employment status?
Mnemonic: EMPLOYMENT
Value labels:
Work for payment or profit 1
Work for payment of profit, but absent on paid leave, holidays 2
Unpaid work in family business 3
Other unpaid work 4
Did not have a paid job 5
Missing value:
No answer 99
Regroup to: **EMPLOYGROUP**
Have a paid job (1+2 on employment)  1
Have a non paid job (3+4 on employment)  2
Did not have a paid job  3
No answer  99

**CODEBOOK ENTRY FOR QUESTION 4**
**Question 4:** *What is the level of the highest qualification you have completed?*

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<td>Did not complete Primary School  2</td>
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<tr>
<td></td>
<td>Completed School Year 10  3</td>
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<tr>
<td></td>
<td>Completed HSC Year 12  4</td>
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<td></td>
<td>TAFE Certificate or Diploma  5</td>
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<td></td>
<td>University or tertiary degree</td>
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<td>Missing value:</td>
<td>No answer  99</td>
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Regroup to: **QUALIFYGROUP**
Less than 12 years of schooling (1+2+3 at Qualify)  1
Year 12+ TAFE  2
UNI or more  3
No answer  99

**CODEBOOK ENTRY FOR QUESTION 5**
**Question 5:** *What is your reason visiting your dentist today?*

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Yes 1

**Mnemonic:** REASON 6/FLUORIDE TREATMENT
No 0
Yes 1

**Mnemonic:** REASON7/TEETH CLEANED
No 0
Yes 1

**Mnemonic:** REASON8/WHITENING
No 0
Yes 1

**Mnemonic:** REASON9/OTHER
No 0
Yes 1

Recode/Recode to **REASON GROUP**
Preventive (Check up+Flouride+Teeth Cleaned) 1
Treatment (Filling+Gum treatment) 2
Emergency (Pain+Tooth extracted) 3

**CODEBOOK ENTRY FOR QUESTION 6**
Question 6: *When did you last visit to your dentist?*
**Mnemonic:** VISIT/WHEN DID YOUR LAST VIST TO THE DENTIST
Value labels:
- Less than 12 months ago 1
- One year to less than 2 years ago 2
- Two to less than five years ago 3
- Five to less than 10 years ago 4
- 10 years ago or more 5
- Never 6
Missing value: No answer 99

**CODEBOOK ENTRY FOR QUESTION 7**
Question 7: *Which of the following best describes your smoking status?*
**Mnemonic:** SMOSTAT
Value labels:
- I smoke daily 1
- I smoke occasionally 2
- I’ve tried it a few times, but never smoked regularly 3
- I don’t smoke now, but I used to smoke 4
- No answer 99
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<th>Regroup to SMOKEGR</th>
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<td>Current smokers (daily+occasional)</td>
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<tr>
<td>Not a current smoker (3+4 at smostat)</td>
<td>2</td>
</tr>
<tr>
<td>Never smoked</td>
<td>3</td>
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<td>No answer</td>
<td>99</td>
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**CODEBOOK ENTRY FOR QUESTION 8**

Question 8: For each of the following statements, please tick one box only in each row.

**Smoking is a risk factor for the development of lung cancer**

Mnemonic: RISKFACTOR1/FOR LUNG CANCER  
Value labels:  
- Yes: 1  
- No: 0  
- Don’t know: 2  
Missing value: No answer: 99

**Smoking is a risk factor for the development of cancer of the mouth**

Mnemonic: RISKFACTOR2/FOR MOUTH CANCER  
Value labels:  
- Yes: 1  
- No: 0  
- Don’t know: 2  
Missing value: No answer: 99

**Smoking is a risk factor for the development of gum disease**

Mnemonic: RISKFACTOR3/FOR GUM DISEASE  
Value labels:  
- Yes: 1  
- No: 0  
- Don’t know: 2  
Missing value: No answer: 99

**Smoking is a risk factor for the development of cancer of the lip**

Mnemonic: RISKFACTOR4/FOR LIP CANCER  
Value labels:  
- Yes: 1  
- No: 0  
- Don’t know: 2  
Missing value: No answer: 99

**Smoking delays healing of wounds in the mouth**

Mnemonic: RISKFACTOR5/DELAY WOUND HEALINGS  
Value labels:  
- Yes: 1  
- No: 0  
- Don’t know: 2  

100
Smoking is a risk factor for the development of cancer of the tongue
Mnemonic: RISKFACTOR6/FOR TONGUE CANCER
Value labels: Yes 1
              No 0
              Don’t know 2
Missing value: No answer 99

Smoking is a risk factor for cavities (holes in the teeth)
Mnemonic: RISKFACTOR7/FOR TOOTH CAVITIES
Value labels: Yes 1
              No 0
              Don’t know 2
Missing value: No answer 99

CODEBOOK ENTRY FOR QUESTION 9
Question 9: During the past three months the Government has started the National Tobacco Campaign using health warning pictures of smoking related diseases. Do you recall seeing any of these pictures?
Mnemonic: RECALL/DO YOU RECAL SEEING THE NTC
Value labels: Yes 1
              No 0
Missing value: No answer 99

If yes, what images do you recall? Please write...
Mnemonic: IFYES1/CAUSING PERIPHERAL VASCULAR DISEASE
Value labels: Yes 1
              No 0
Missing value: No answer 99

Mnemonic: IFYES2/CAUSING EMPHYSEMA
Value labels: Yes 1
              No 0
Missing value: No answer 99

Mnemonic: IFYES3/CAUSING MOUTH AND THROAT CANCER
Value labels: Yes 1
              No 0
Missing value: No answer 99
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<th>IFYES5/DON’T LET CHILDREN BREATHE YOUR SMOKE</th>
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**CODEBOOK ENTRY FOR QUESTION 10**

**Question 10: Where did you hear or see these health warning pictures?**

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| Mnemonic:                      | HEARSEE3/CIGARETTE PACK                                             |

102
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<td>No 0</td>
</tr>
<tr>
<td>Missing value:</td>
<td>No answer 99</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mnemonic:</th>
<th>HEARSEE9/BUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value labels</td>
<td>Yes 1</td>
</tr>
<tr>
<td></td>
<td>No 0</td>
</tr>
<tr>
<td>Missing value:</td>
<td>No answer 99</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mnemonic:</th>
<th>HEARSEE10/OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value labels</td>
<td>Yes 1</td>
</tr>
<tr>
<td></td>
<td>No 0</td>
</tr>
<tr>
<td>Missing value:</td>
<td>No answer 99</td>
</tr>
</tbody>
</table>
### CODEBOOK ENTRY FOR QUESTION 11

Question 11: *Which of the following best describes how you feel about your smoking?*

Mnemonic: **FEEL/WHAT PATIENTS FEEL ABOUT THEIR SMOKING**

<table>
<thead>
<tr>
<th>Value labels</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>I'm not planning on quitting within the next six months</td>
<td>1</td>
</tr>
<tr>
<td>I am planning on quitting within the next six months</td>
<td>2</td>
</tr>
<tr>
<td>I am planning on quitting within the next month</td>
<td>3</td>
</tr>
<tr>
<td>I have not smoked in the past 24 hours but was smoking 6 months ago</td>
<td>4</td>
</tr>
<tr>
<td>Not applicable</td>
<td>13</td>
</tr>
<tr>
<td>Missing value</td>
<td>99</td>
</tr>
</tbody>
</table>

Regroup to: **FEELGROUP**

| I am planning on quitting within the next six months+the next month           | 1    |
| I'm not planning on quitting within the next six months + I have not smoked in the past 24 hours but was smoking 6 months ago | 2    |
| No answer                                                                    | 3    |

### CODEBOOK ENTRY FOR QUESTION 12

Question 12: *Please rate your agreement with the following statement: The current National Tobacco Campaign showing images of lip and tongue cancer will increase the likelihood of my trying to make a quit attempt within the next six months?*

Mnemonic: **TRYING/IS THE NTC WILL MAKE YOU MORE LIKELY TO QUIT**

<table>
<thead>
<tr>
<th>Value labels</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>1</td>
</tr>
<tr>
<td>Agree</td>
<td>2</td>
</tr>
<tr>
<td>Unsure</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>5</td>
</tr>
<tr>
<td>Not applicable</td>
<td>13</td>
</tr>
<tr>
<td>Missing value</td>
<td>99</td>
</tr>
</tbody>
</table>

Regroup to: **TRYINGGROUP**

| Strongly agree+agree              | 1    |
| Unsure+strongly disagree+disagree | 2    |
| No answer                         | 3    |

### CODEBOOK ENTRY FOR QUESTION 13

Question 13: *Please rate your agreement with the following statement: If my dentist suggested that I quit smoking, I would try to stop?*

Mnemonic: **TRYSTOP/WIL YOU TRY TO QUIT SMOKING IF YOUR DENTIST ASK YOU TO DO SO**

<table>
<thead>
<tr>
<th>Value labels</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>1</td>
</tr>
</tbody>
</table>
Agree 2
Unsure 3
Disagree 4
Strongly disagree 5
Not applicable 13
Missing value: No answer 99

Recode to: TRYSTOPGROUP
Strongly agree+agree 1
Unsure+strongly disagree+disagree 2
No answer 3

CODEBOOK ENTRY FOR QUESTION 14
Question 14: If you decided to quit in the next month, how confident are you that you would succeed?
Mnemonic: CONFIDENT/HOW CONFIDENT ARE YOU TO QUIT
Value labels:
Very confident 1
Confident 2
Unsure 3
Not very confident 4
Not at all confident 5
Not applicable 13
Missing value: No answer 99

Recode to: CONFIDENTGROUP
Very confident + confident 1
Unsure+not very confident+not at all confident 2
No answer 3

CODEBOOK ENTRY FOR QUESTION 15
Question 15: Which of the following support persons would you use to help you make this quit attempt?
Mnemonic: DOCTOR
Value labels:
Yes 1
No 0
Don’t know 2
Not applicable 13
Missing value: No answer 99

Mnemonic: PHARMACIST
Value labels:
Yes 1
No 0

105
Don’t know 2  
Not applicable 13  
Missing value: No answer 99  

Mnemonic: DENTIST  
Value labels:  
Yes 1  
No 0  
Don’t know 2  
Not applicable 13  
Missing value: No answer 99  

Mnemonic: NSW QUIT  
Value labels:  
Yes 1  
No 0  
Don’t know 2  
Not applicable 13  
Missing value: No answer 99  

Mnemonic: COUNSELLOR  
Value labels:  
Yes 1  
No 0  
Don’t know 2  
Not applicable 13  
Missing value: No answer 99  

Mnemonic: OTHER  
Value labels:  
Yes 1  
No 0  
Don’t know 2  
Not applicable 13  
Missing value: No answer 99  

LIST OF VARIABLES FOR QUESTIONNAIRE FOR THE PATIENT  
1. ID PATIENT  
2. ID DENTIST  
3. GENDER  
4. D.O.B  
5. AGEGROUP  
6. EMPLOYMENT  
7. EMPLOYGROUP  
8. QUALIFY  
9. QUALIFYGROUP  
10. REASON1/CHECK UP  
11. REASON2/PAIN OR TOOTH ACHE
12. REASON3/DENTAL FILLING
13. REASON4/GUM TREATMENT
14. REASON5/TOOTH EXTRACTED
15. REASON6/FLUORIDE TREATMENT
16. REASON7/TEETH CLEANED
17. REASON8/WHITENING
18. REASON9/OTHER
19. REASONGROUP
20. VISIT
21. SMOSTAT
22. SMOKEGR
23. RISKFACTOR1/FOR LUNG CANCER
24. RISKFACTOR2/FOR MOUTH CANCER
25. RISKFACTOR3/FOR GUM DISEASE
26. RISKFACTOR4/FOR LIP CANCER
27. RISKFACTOR5/DELAY WOUND HEALING
28. RISKFACTOR6/FOR TONGUE CANCER
29. RISKFACTOR7/FOR TOOTH CAVITIES
30. RECALL
31. IFYES1/CAUSING PERIPHERAL VASCULAR DISEASE
32. IFYES2/CAUSING EMPHYSEMA
33. IFYES3/CAUSING MOUTH AND THROAT CANCER
34. IFYES4/CLOGGING YOUR ARTERIES
35. IFYES5/DON'T LET CHILDREN BREATHE YOUR SMOKE
36. IFYES6/A LEADING CAUSE OF DEATH
37. IFYES7/QUITTING WILL IMPROVE YOUR HEALTH
38. IFYES8/OTHER
39. HEARSEE1/MAGAZINE
40. HEARSEE2/TELEVISION
41. HEARSEE3/CIGARETTE PACK
42. HEARSEE4/PAPYLET-PAPER-BOOKLET
43. HEARSEE5/BILLBOARDS
44. HEARSEE6/DOCTOR SURGERY
45. HEARSEE7/DENTAL SURGERY
46. HEARSEE8/PHARMACY
47. HEARSEE9/BUS
48. HEARSEE10/OTHER
49. FEEL/WHAT PATIENT FEEL ABOUT THEIR SMOKING
50. FEELGROUP
51. TRYING/IS THE NTC WILL MAKE YOU MORE LIKELY TO QUIT
52. TRYINGGROUP
53. TRYSTOP/WILL YOU TRY TO STOP IF THE DENTIST ASK YOU
54. TRYSTOPGROUP
55. CONFIDENT/HOW CONFIDENT ARE YOU TO QUIT
56. CONFIDENTGROUP
57. DOCTOR
58. PHARMACIST
59. DENTIST
60. NSWQUIT
61. COUNSELLOR
Appendix M

ADRФ grant Approval
Ms R M Affah  
Faculty of Dentistry  
University of Sydney Dental Hospital  
6th Floor, 2 Chalmers Street  
SURRY HILLS NSW 2010

30 November 2006

Dear Ms Affah,

ADRF GRANT APPLICATION 51/2006

Affah Ms R M  
Schwarz Prof Eli

At their Annual Meeting held on 21 November 2006, the Directors of the Australian Dental Research Foundation considered your application for a grant to support the project entitled:

"The effect of a Government anti-smoking campaign on patient demand for health advice in dentist offices"

It was agreed that your application be supported to the extent of $2,500.00 for one year. Subject to your agreement to the Conditions, the Directors have specified your research grant will take effect from January 2006. Australian Dental Research Foundation grants are normally paid in arrears. However, the Directors recognise that applicants may incur some unavoidable expenses in commencing their projects, particularly where equipment is to be purchased, and we would be willing to make an initial payment available to you on receipt of a detailed statement of the requirements.

I enclose a document setting out the Conditions of your research grant and I would be grateful if you would sign the attached acknowledgment form (page 3 of Conditions) and return it to this office. This exchange will represent the contract between you, your co-workers and the Foundation.

At the conclusion of the project a final report shall be submitted to the Foundation, together with either an article or an extended abstract in a form suitable for publication in the Australian Dental Journal. The article or abstract will be forwarded by the Foundation to the Australian Dental Journal for consideration for publication at the Editor's discretion. A copy of "Guidelines for Authors" is enclosed. Publication in the Australian Dental Journal shall not prevent the author(s) from submitting more detailed or specialised papers to other scientific journals. It is permissible also to submit the primary article to another scientific journal provided that an extended abstract is supplied to the Foundation.
It was the recommendation of the Research Advisory Committee that comments from referees be made available to you and a copy/copies are enclosed.

May I take this opportunity to wish you every success with your undertaking.

Yours sincerely

[Signature]

R N Boyd-Boland
Honorary Secretary

Encls: