

Social nicotine dependence in Australian dental undergraduate students

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Objectives: This study aimed to investigate dental undergraduate students' tobacco usage and social nicotine dependence in Australia. A special interest was to identify the role of factors such as age, gender, year of dental education and cohabitants' smoking status for social nicotine dependence. **Materials and methods:** A sample of 252, first-to-fifth year undergraduate students in an Australian dental school was used. Each completed a self-administered questionnaire. **Results:** The smoking rate was 4.8%. Current smokers displayed higher social nicotine dependence than those that had never smoked ($t = 3.1$, $df = 244$, $P = 0.002$). Dental undergraduate students that showed higher social nicotine dependence ($P = 0.001$, OR = 1.3, 95% CI: 1.1–1.6), or that had smoking cohabitants ($P = 0.016$, OR = 4.8, 95% CI: 1.3–17.0), were more likely to smoke. Students' social nicotine dependence increased with year of dental study ($P = 0.043$, $\beta = 0.4$, $t = 2.0$). Social nicotine dependence enhanced tobacco usage among Year-1-to-4 students ($P = 0.005$, OR = 1.4, 95% CI: 1.1–1.7) but not Year-5 undergraduates ($P = 0.432$). **Conclusions:** Social nicotine dependence has become a developing issue in dental education. Tobacco control should be highlighted in the dental curriculum. Future investigations into the effects of dental education on social nicotine dependence and tobacco usage are indicated.

Key words: Undergraduate dental education, social nicotine dependence, smoking

Dentists can play an ideal role in tobacco cessation because they 'have regular contact with patients, are the first to see the effects of tobacco in the mouth and are the only health professionals who frequently see 'healthy' patients'¹. A majority of dental practitioners agreed that offering brief smoking cessation advice to patients is a part of their professional responsibility². Intervention of tobacco cessation in dental settings has shown varying degrees of effectiveness^{3,4}. Worldwide dental education organisations have policies encouraging members to provide tobacco cessation service to patients⁵.

During the current decade, the literature has reported that less than 10% of dentists were smokers^{6,7}. Smoking rates among dental undergraduate students remained higher in some recent studies^{8–13}. Those dental professionals who smoked provided the intervention of tobacco cessation to their patients less often than those dentists who did not smoke⁷. A positive attitude towards dentists' smoking behaviour and a

passive attitude towards smoking cessation programmes conducted by dentists were also found in the smoking group of dental students^{8,13}. Tobacco usage among dental undergraduate students may consequently, after they become dentists, reduce the frequency and/or effectiveness of tobacco cessation schemes provided to their patients.

Nicotine dependence has been identified as a determinant for effectiveness and/or motivation of smoking abstinence^{14–16}. Connections between educational activities and nicotine dependence have been reported^{10,14}. Croucher *et al.*¹⁴ demonstrated that those with low physical nicotine dependency succeeded in tobacco cessation with brief encouragement and advice alone, without application of nicotine replacement therapy. A new concept of social nicotine dependence has been defined as 'a misperception of smoking caused by smokers' attempts, for example, to deny the ill effects of tobacco and/or to justify themselves by regarding smoking as acceptable cultural

and social behavior¹⁶. In a previous publication, a decrease in smoking students' social nicotine dependence after their attendance at a tobacco-control educational programme at two dental schools was reported¹⁰. A correlation between social and physical nicotine dependence has been suggested¹⁶.

Since there is a connection between social as well as physical nicotine dependence and a potential to reduce the dependence by education, a survey of social nicotine dependence may explore the relevance of tobacco-control courses in dental education. This paper aimed to investigate dental undergraduate students' tobacco usage and social nicotine dependence in Australia. A special interest was to identify the role of factors such as age, gender, year of dental education and cohabitants' smoking status for social nicotine dependence.

MATERIALS AND METHODS

A cross-sectional survey was conducted in an Australian university. Undergraduate students from all 5 years of the dental school were invited to participate. The appropriate research ethics approval was obtained from the university. Occasions were identified when students would attend a lecture together. The lecturers were approached, and permission was sought to survey the students at the end of the lectures. A researcher explained the purpose of the study to the students, sought their consent to participate and assured them of confidentiality.

Data of social nicotine dependence were collected using the Kano Test for Social Nicotine Dependence (KTSND)¹⁷. The KTSND is composed of ten items, one of which is reverse-scored, measured on a four-point Likert scale from 'strongly agree', 'somewhat agree', 'somewhat disagree' to 'strongly disagree'. The possible range of KTSND scores is 0, indicating low social nicotine dependence, to 30, indicating high dependence. The KTSND questionnaire was originally developed in the Japanese language. Firstly it was translated from Japanese into English. The English version was re-translated into Japanese by a different interpreter to check validation. A pilot study was carried out to test the administration of questionnaires. The results confirmed the protocol was feasible and the translation was adequate.

Each student completed a self-administered questionnaire. Questions regarding age, gender, year of dental education, personal smoking experience and cohabitants' smoking status were also included. Completion of the questionnaire took 5–10 minutes. Upon completion, participants were given identical envelopes in which to seal their questionnaires. This was to ensure students' anonymity when they returned the questionnaires to the researcher.

Data entry and statistical analysis were carried out with the IBM SPSS Statistics (version 19.0, IBM Corporation, Somers, NY, USA). Data analysis included frequency distribution and cross tabulation. Tobacco usage status was separated as current smokers and non-smokers (comprising former smokers and those who had never smoked). A binary logistic regression method was used to establish a relationship between current tobacco usage and potential factors. Stepwise linear regression analysis was conducted to identify covariates of KTSND scores. The level of significance was set at 5%.

RESULTS

Two hundred and sixty students were invited to participate, based on the registration records of the dental school in the first academic semester of 2008. Five of the 260 students were absent from school on the days of questionnaire administration. Of the 255 questionnaires that were returned, 252 were completed fully for a response rate of 96.9%; 147 participants were female (58.3%), and 105 (41.7%) were male. Students' age ranged from 17 to 36, with a mean of 20.9 (SD = 3.1). Sixty-four undergraduate students were living with tobacco users (25.4%), whilst 188 did not have smoking cohabitants (74.6%).

The current smoking rate in the sample was 4.8% (95% CI: 2.6–8.4). When including former smokers, the prevalence of tobacco usage was 7.1% (95% CI: 4.4–11.2). Cronbach's alpha which measured the internal consistency of the 10 KTSND items was 0.7. This indicated an acceptable reliability. *Figure 1* illustrates the outcomes of individual KTSND items.

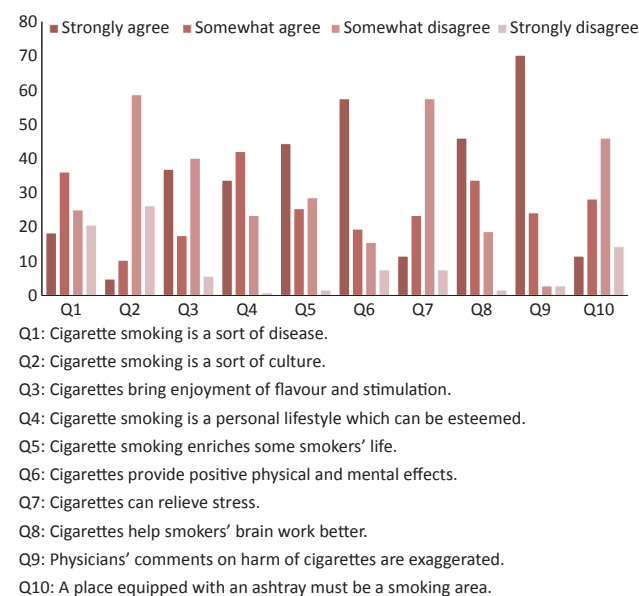


Figure 1. Percentage distribution of outcomes of individual KTSND items in the sample of the study ($n = 252$).

The mean of the KTSND scores was 11.6 (95% CI: 11.1–12.1). Current smokers and non-smokers (comprising former smokers and those who had never smoked) showed a mean KTSND score at 15.3 (95% CI: 12.5–18.2) and 11.4 (95% CI: 10.9–11.9), respectively (Table 1). Dental undergraduate students that reported a higher KTSND score ($P = 0.001$, OR = 1.3, 95% CI: 1.1–1.6), or that had smoking cohabitants ($P = 0.016$, OR = 4.8, 95% CI: 1.3–17.0), were more likely to be current smokers (Tables 1 and 2). Thus, scoring 30 points in KTSND was 5,557.8 times the smoking probability of scoring 0 point (95% CI: 30.0–1,060,510.4). Age, gender and year of dental education were not associated with current tobacco usage ($P \geq 0.359$).

The population was further divided into two groups, Year-1-to-4 and Year-5 students, according to the degree of exposure to clinical practice. Those junior-year students who had a higher KTSND score were more likely to smoke ($P = 0.005$, OR = 1.4, 95% CI: 1.1–1.7). Living with smokers was marginally related to current tobacco usage ($P = 0.079$, OR = 4.7, 95% CI: 0.8–26.7). Age, gender and year of dental study were not associated with junior-year students' smoking status ($P \geq 0.306$). Year-5 students' current tobacco usage was somewhat associated with age ($P = 0.098$, OR = 1.4, 95% CI: 0.9–2.0). KTSND scores, gender and smoking cohabitants did not have an influence on senior-year students' smoking status ($P \geq 0.432$).

Students that were undertaking a higher year of dental study displayed a higher KTSND score

($P = 0.043$, $\beta = 0.4$, $t = 2.0$). Age, gender and cohabitants' smoking status were not related to KTSND scores ($P \geq 0.149$). Table 3 compares the mean KTSND scores by gender, year of dental education and cohabitants' smoking status.

DISCUSSION

Undergraduate students' smoking rate observed in this Australian dental school was lower than that reported by some researchers^{8–13}, although this resembled the findings from dental institutions in Taiwan¹⁰, Thailand¹² and India¹². The rate was also much lower than that among the general population in Australia¹⁸. A similar gap between dental undergraduate students and the general population has been displayed in an Irish sample¹¹. This disagreed with a study which suggested a similar smoking rate between the two populations in Italy⁹.

The mean KTSND score observed in this population is in agreement with previous studies based on samples of dental students¹⁰ and the general population^{16,17}. Compared with the difference of smoking rates between dental undergraduate students and the general population, a gap for social nicotine dependence was not found. Furthermore, this study showed that KTSND scores were highly associated with smoking behaviour, assenting to former findings^{10,16,17}. This suggested that social nicotine dependence is a developing issue in dental education.

The year of dental study was not associated with the smoking rate at this school. This disagrees with some papers that have reported a higher smoking rate among senior-year students^{8,9}. Since approximately 2% of the

Table 1 Relationship of current tobacco usage and KTSND scores in the sample of the study ($n = 252$)

	Smoker	Non-smoker [†]	All	OR (95% CI)	P-value
Mean KTSND score (95% CI)	15.3 (12.5–18.2)	11.4 (10.9–11.9)	11.6 (11.1–12.1)	1.3 (1.1–1.6)	0.001*

* $P < 0.05$.

[†]Comprising former smokers and those who had never smoked.

Table 2 Frequency distribution of current tobacco usage by gender, year of dental education and cohabitants' smoking status in the sample of the study ($n = 252$)

	Smoker	Non-smoker [†]	All	OR (95% CI)	P-value
Gender					
Female	7 (4.8%)	140 (95.2%)	147 (58.3%)	1	
Male	5 (4.8%)	100 (95.2%)	105 (41.7%)	1.0 (0.3–3.2)	1.000
Year of dental education					
First	2 (3.6%)	53 (96.4%)	55 (21.8%)	1	
Second	2 (3.1%)	63 (96.9%)	65 (25.8%)	0.8 (0.1–6.2)	0.865
Third	4 (8.3%)	44 (91.7%)	48 (19.0%)	2.4 (0.4–13.8)	0.323
Fourth	2 (5.1%)	37 (94.9%)	39 (15.5%)	1.4 (0.2–10.6)	0.725
Fifth	2 (4.4%)	43 (95.6%)	45 (17.9%)	1.2 (0.2–9.1)	0.838
Cohabitants' smoking status					
Without smoking cohabitants	6 (3.2%)	180 (96.8%)	186 (74.4%)	1	
With smoking cohabitants	6 (9.4%)	58 (90.6%)	64 (25.6%)	4.8 (1.3–17.0)	0.016*

* $P < 0.05$.

[†]Comprising former smokers and those who had never smoked.

Table 3 Comparison of mean KTSND scores by gender, year of dental education and cohabitants' smoking status in the sample of the study ($n = 252$)

	Mean KTSND Score (95% CI)	P-value
Year of dental education		
First	10.9 (9.6–12.2)	0.043*
Second	10.3 (9.2–11.4)	
Third	13.7 (12.6–14.8)	
Fourth	11.9 (10.7–13.2)	
Fifth	11.8 (10.7–12.9)	
Gender		
Male	12.1 (11.2–12.9)	0.149
Female	11.3 (10.6–11.9)	
Cohabitants' smoking status		
With smoking cohabitants	10.9 (9.9–11.9)	0.173
Without smoking cohabitants	11.8 (11.1–12.4)	

* $P < 0.05$.

students were former smokers in this study, consistency of the smoking rate among dental years could be due to a similarly low percentage of senior-year students' initiation of tobacco usage. This assumption agrees with Haresaku *et al.*¹³ who demonstrated an effect of having information about tobacco in the dental curriculum on the protection of smoking initiation other than the induction of cessation, based on an unchanged smoking rate amongst the same dental students in two surveys at a 3-year interval.

This study demonstrated a positive relationship between the year of dental study and social nicotine dependence. Because KTSND scores were not associated with age in this population, this indicated a connection between senior-year students' high KTSND scores and the dental education that they have received. On the other hand, the current smoking rate did not increase with the year of dental study even though senior-year students had higher social nicotine dependence than junior-year students. Since the smoking rate was related to social nicotine dependence other than age, the reason why senior-year students' higher social nicotine dependence failed to result in a higher smoking rate can be ascribed to dental education. In this study, significant contribution of social nicotine dependence to tobacco usage amongst the Year-1 to -4 students but not the Year-5 students further confirmed the effect of dental education on tobacco control.

As this research used a cross-sectional study method, a cause-result sequence could not be confirmed directly. Further research is required to explore changes in smoking behaviour and social nicotine dependence following each year of dental education.

CONCLUSIONS

This study has manifested a key role of dental education on dental undergraduate students' tobacco control by

disclosing that senior-year students' higher social nicotine dependence did not predispose to smoking. In addition, evaluation of social nicotine dependence with the English version of the KTSND has been confirmed to be feasible.

Social nicotine dependence has become a relevant issue in dental education. Tobacco control should be highlighted in the dental curriculum to benefit students, dental professionals, patients and the community. Further investigations into the effects of dental education on social nicotine dependence and smoking behaviour are indicated.

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