FACTORS ASSOCIATED WITH SELF-EFFICACY AND BEHAVIOUR IN PROVIDING SMOKING CESSATION INTERVENTION FOR ADULT PATIENTS AMONG PUBLIC DENTISTS IN NORTHEAST MALAYSIA

Ismail NZI[1], Mohd Adnan M[1], Abd Rahman N,[1] Othman Z[2], and Hashim NA[3].
[1]Dental Public Health Unit, School of Dental Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan
[2]Terengganu Oral Health State Division, Level 1, Wisma Persekutuan, Jalan Sultan Ismail, 20920 Kuala Terengganu, Terengganu
[3]Kuala Krai District Oral Health Office, 18000, Kuala Krai, Kelantan

Correspondence:
Munirah Mohd Adnan,
Dental Public Health Unit,
School of Dental Sciences,
Universiti Sains Malaysia, Health Campus,
16150 Kubang Kerian, Kelantan
Email: muniraha@usm.my

Abstract

Introduction: The smoking prevalence in Malaysia continues to be a crucial issue, negatively affecting not only general health but also oral health. Although dentists are in an ideal position to assist in smoking cessation, it is unclear to what extent they are prepared to do so effectively. Therefore, this study aimed to assess the self-efficacy and behaviour of public dentists in providing smoking cessation interventions to adult patients, as well as the associated factors.

Materials and Methods: A cross-sectional study was conducted between November and December 2022, involving 160 dentists working in public primary dental clinics in Kelantan and Terengganu. Convenience sampling was applied, and data collection was carried out online using Google Forms®. The questionnaire comprised of 16 items in the demographic section and 11 items each for the self-efficacy and behaviour sections. The data was entered and analysed using SPSS version 26.0. The levels of self-efficacy and behaviour were categorised as low, moderate, and high based on percentiles: low at the 33rd percentile, moderate between the 33rd and 66th percentile, and high above the 66th percentile. Independent t-tests and Pearson's correlation coefficient analyses were performed to assess factors associated with self-efficacy and behaviour.

Results: The study found that the majority of participants were female (83.8%), Malay (98.1%), and never-smokers (96.9%). The participants' mean (SD) age was 32.2 (3.64) years old. The results showed that most participants scored at or below the 33rd percentile for self-efficacy (38.1%) and behaviour (35.6%). Self-efficacy was significantly associated with gender ($p = 0.037$) and attended smoking cessation intervention training ($p = 0.008$). The study also revealed that self-efficacy had a significant moderate positive correlation with the behaviour towards providing smoking cessation intervention, $r = 0.509$, $p < 0.001$.

Conclusions: Public dentists in this study appear to lack self-efficacy and demonstrate limited behaviour in providing smoking cessation interventions to adult patients. The gender of the dentists and having attended smoking cessation intervention training were associated with their self-efficacy. Furthermore, an increase in self-efficacy was associated with improved behaviour in providing smoking cessation interventions. Therefore, it is recommended that smoking cessation intervention training be made available to public dentists in order to enhance both their self-efficacy and behaviour in providing smoking cessation interventions for adult patients.

Keywords: Dentists, Smoking Cessation, Self-Efficacy, Behaviour

Introduction

Smoking remains a global public health challenge. The prevalence of smoking in Malaysia was 21.3% in 2019 (1). This is still far from achieving the 15.0% smoking prevalence targets by 2025 and 5.0% by 2040, as stated in the Malaysia National Strategic Plan for The Control of Tobacco and Smoking Products 2021-2030 (2).

Smoking cessation is crucial because of its negative effects on health. Smoking increases the risk of stroke (3), diabetes (4), chronic obstructive pulmonary disease and adult-onset asthma (5). In addition, smoking promotes tumour growth (6) and the likelihood of developing a secondary malignancy (7). Smoking also impairs male fertility (8), and female smokers are 48.0% more likely to experience sexual problems (9). In addition, smoking is a risk factor for ectopic pregnancy (10) and urogenital teratogenesis (11).

Smoking also has significant implications for oral health. Smoking causes stains and discolouration on teeth, especially on composite materials (12). It can disrupt oral microbial ecology, leading to periodontal diseases (13), increase the risk of peri-implant marginal bone loss and lead to dental implant failure (14). Smoking also delays wound healing, leading to complications such as dry sockets after tooth extraction (15). Smoking also alters deoxyribonucleic acid (DNA), which leads to precancerous lesions such as leukoplakia, oral lichen planus, erythroplakia, oral submucous fibrosis and oral cancer such as oral squamous cell carcinoma (16).

Smoking cessation is a crucial aspect of public health, as it significantly reduces the risk of various health issues. Dentists play a crucial role in promoting oral health and preventing tobacco-related oral diseases. Evidence shows that dentists are in the right position to provide smoking cessation screening and interventions, and their involvement increases smoking cessation rates (17). Furthermore, the WHO Framework Convention on Tobacco Control (WHO FCTC) recommended that dental professionals routinely offer at least a brief tobacco intervention in primary care. It is also important to incorporate smoking cessation interventions into dental visits to help smokers, regardless of their readiness to quit. The integration could increase the opportunity to meet smokers who are unlikely to seek treatment for their smoking habit (18).

Previous research conducted among public dentists in Saudi Arabia found that they routinely inquired about patients' smoking habits yet commonly did not provide explanations about the effects of tobacco (19). Additionally, a study in Malaysia demonstrated that public dentists were more inclined to offer advice on the impact of smoking rather than providing self-help materials, recommending nicotine replacement therapy (NRT), referring patients to quit-smoking clinics, or conducting follow-up visits (20). A study in India found that almost all dentists can confidently explain the harmful effects of tobacco use, and more than half are well prepared to offer cessation services. However, only a quarter of the dentists provide NRT and believe they do not have enough knowledge to introduce it to their patients (21). Similarly, very few public dentists in Malaysia knew how to provide NRT to smokers who were ready to quit. Public dentists were also less confident than private dentists in asking patients about their smoking status and assessed willingness to quit (22).

Based on the findings from previous studies, dentists might lack the efficacy to provide smoking cessation intervention. The self-efficacy of dentists in providing smoking cessation interventions is crucial, as it reflects their readiness to be involved in smoking cessation intervention and ensures that effective interventions can be delivered (23). Understanding the factors that influence dentists' self-efficacy and behaviour in providing smoking cessation interventions is essential for tailoring effective strategies and interventions to address the specific needs of this population. Furthermore, understanding the actual behaviour of dentists towards providing smoking cessation interventions is equally critical. Behavioural factors, such as attitudes and training experiences, can significantly influence the likelihood of dentists engaging in smoking cessation activities (24). Examining these factors will reveal the specific challenges and opportunities faced by dentists, potentially informing targeted interventions and policies to enhance the provision of smoking cessation services. Therefore, this study aimed to assess dentists' self-efficacy and behaviour, as well as associated factors, in providing smoking cessation interventions to adult patients in public primary dental clinics.

Materials and Methods

Study design and sampling frame

A cross-sectional study was conducted from November to December 2022 among dentists practising at public primary dental clinics located in Kelantan and Terengganu.

The sampling frame comprised of dentists practising at public primary dental clinics who fulfilled the study's inclusion and exclusion criteria. The inclusion criteria were dentists who are Malaysian citizens with permanent employment. Dental specialists and dentists primarily involved in management and not fully engaged in primary care were excluded from the study.

Sample size determination

The sample size was determined utilising Wan Nor Arifin's Sample Size Calculator (25), with an anticipated correlation of 0.25 between self-efficacy and behaviour and a significance level of 0.05. The study required a minimum of 123 participants and a maximum of 164 participants, considering an expected dropout rate of 25.0%.

Recruitment process and sampling methods

A request was made to the Oral Health Program, Ministry of Health, to obtain information about the number of dentists working at the public primary dental clinic. Due

to practicality and time constraints, the study was limited to Kelantan and Terengganu. Only public dentists were included in the study, as the results would be significant for implementing smoking cessation intervention programs for public dentists in the future. After obtaining ethical approval, the Deputy Directors of the Kelantan and Terengganu State Oral Health Divisions were approached to discuss the study's purposes and procedures, as well as to explain the roles of upper management in the study.

The study proceeded with participant recruitment. An email invitation was sent to the Deputy Directors, who then forwarded it to the District Dental Officer in each district. The invitation, along with information about the research, study criteria and a Google Forms® link, was disseminated to dentists. Dentists who fulfilled the study criteria, volunteered, and expressed interest in participating were required to complete a participant recruitment form using Google Forms®. Contact details, including their phone numbers and email addresses, were collected through Google Forms®. Convenience sampling was employed to recruit participants for this study.

Research instrument

The questionnaire utilised in this study was adapted from the validated Malay edition of the Questionnaire for the Evaluation of Smoking Cessation Training (ProSCiTE)®, developed by Hasan et al. (26). Prior to its use in this study, permission was obtained from the author to adapt the questionnaire. The ProSCiTE® questionnaire was originally designed to assess the smoking cessation intervention among healthcare providers. For this study, 16 items from the demography section, 11 out of 13 items in the self-efficacy section, and 11 out of 19 items in the behaviour section were selected. These chosen items underwent revision and reordering based on discussion with the research team.

Following that, a content validation was conducted involving six expert panels, including a public health specialist, four dental public health specialists, and one psychiatrist. The self-efficacy and behaviour content validation scores were 1.00 and 0.98, respectively, indicating that the questionnaire was deemed appropriate and comprehensive (27).

A face validation procedure was then conducted with 30 dentists practising in the Kedah State Oral Health Division. The results revealed a score of 0.99 for both self-efficacy and behaviour, indicating that the instructions and language used in the questionnaire were clear and easily comprehensible (28). They also reported that the questionnaire was straightforward and easy to use which took an average of 15.4 minutes to complete.

The final version of the questionnaire included 16 demographic questions, 11 self-efficacy questions and 11 behaviour questions. The self-efficacy section featured response options categorised as follows: 'Certainly' (score of 4), 'Probably' (score of 3), 'Probably Not' (score of 2), and 'Certainly Not' (score of 1). Participants assigned these scores based on their confidence levels in providing smoking cessation intervention to adult patients. The self-efficacy scores ranged from a minimum of 11 to a maximum of 44.

Meanwhile, the behaviour assessment provided five response options: 'Always' (score of 5), 'Often' (score of 4), 'Sometimes' (score of 3), 'Rarely' (score of 2), and 'Never' (score of 1). The participants chose the scores based on how they responded to specific situations or stimuli related to smoking cessation intervention for adult patients. The total behaviour scores ranged from a minimum of 11 to a maximum of 55.

Data collection process

Data collection for this study was conducted online through Google Forms®, encompassing research information, consent, and self-administered questionnaires. Participants received a Google Forms® link via WhatsApp, which was provided by the participants during the initial recruitment phase. Consent was obtained when participants selected 'agree' in the designated section before proceeding with answering the questionnaire. Those who chose 'did not agree' were directed to the final section of the Google Forms® and were not required to answer any further questions. In the event of non-response, two reminders were issued at intervals of three days.

Data analysis

The data was then retrieved from Google Forms® and analysed in the IBM® Statistical Package for Social Sciences (SPSS®) Statistics version 26.0. The data was checked and cleaned. A normality test, the Kolmogorov-Smirnov test, was performed. Continuous variables were described using mean and standard deviation (SD), while categorical variables were represented through frequency and percentages. Levels of self-efficacy and behaviour were categorised into 'low,' 'moderate,' and 'high' based on percentiles: 33rd percentile for low (score range between 11.0 to 33.0), 33rd to 66th for moderate (score range between 33.1 to 36.3), and above 66th for high (score range between 36.4 to 44.0) for self-efficacy. For behaviour, the range scores for the 33rd percentile for low was 11.0 to 26.0, 33rd to 66th for moderate was 26.1 to 33.3, and above 66th for high was 33.4 to 55.0. Independent t-tests and Pearson's correlation coefficients analysis were performed to assess factors associated with self-efficacy and behaviour. The significant level was set at 0.05.

Results

Demographic characteristics of participants

A total of 160 dentists participated in this study, resulting in a response rate of 98.8%. The main reason for non-participation was due to other commitments. Among the participants, the majority, 83.8%, were female, 98.1% were Malays, and 96.9% reported never being smokers. The

mean (SD) age of the participants was 32.2 (3.64) years, ranging from 26 to 45 years (Table 1).

The mean (SD) of work experience was 7.3 (3.53) years. Participants estimated that they spent an average of 19.5 (7.50) minutes treating each patient. Around 41.3% of the participants estimated that 26.0% to 50.0% of their adult patients were smokers, and 72.5% reported that their practice had a smoking cessation clinic. Of all the participants, 27.5% had attended a smoking cessation intervention program for adult patients. Among those who had attended the training program, 84.1% had done so more than six months ago, and only 31.8% believed that the training they received was sufficient (Table 1).

Table 1: Demographic characteristics of participants (n = 160)

Variables		n	%
Age (Year) [Mean (SD)]		32.2 (3.64)	
	Min	26	
	Max	45	
Gender			
	Male	26	16.3
	Female	134	83.8
Ethnicity			
	Malay	157	98.1
	Chinese	2	1.3
	Indian	1	0.6
Religion			
	Islam	157	98.1
	Buddhism	2	1.3
	Christianity	1	0.6
Highest qualification			
	Bachelor	153	95.6
	Bachelor and Master	7	4.4
Undergraduate Training			
	Local	89	55.6
	International	71	44.4
Practice Location			
	Kelantan	80	50.0
	Terengganu	80	50.0
Smoking Status			
	Current Smoker	2	1.3
	Ex-Smoker	3	1.9
	Non-Smoker	155	96.9
Working Experience (Years) [Mean (SD)]		7.3 (3.53)	
Estimated Time Spent with Each Patient (Minutes) [Mean (SD)]		19.5 (7.50)	
Estimated Percentage of Adult Patients Smoking			
	0%-25%	54	33.8
	26%-50%	66	41.3
	51%-75%	27	16.9
	76%- 100%	2	1.3
	Not Sure	11	6.9
Availability Of Quit Smoking Clinic at Practise			
	Yes	116	72.5
	No	20	12.5
	Not Sure	24	15.0
Attend Smoking Cessation Intervention Training Program			
	Yes	44	27.5
	No	116	72.5
Last Attended the Training Program			
	1 Month Ago	3	6.8
	3 Months Ago	2	4.5
	6 Months Ago	2	4.5
	More Than 6 Months Ago	37	84.1
The Training Program Organised By			
	Organisation	35	79.5
	Other	8	18.2
	Both	1	2.3
Perceived Adequate Training			
	Adequate	14	31.8
	Inadequate	18	40.9
	Not Sure	12	27.3

Level of self-efficacy in providing smoking cessation intervention to adult patients

Table 2 shows that a majority of participants (92.5%) were confident in asking adult patients about their smoking habits. The study found that only 35.6% of participants believed they could assess the readiness of adult patients

to quit smoking, and 22.5% were confident in assessing the level of nicotine dependence in adult patients who smoke. Only 20.0% were confident that they could motivate those who were not interested. Besides that, 38.8% of the participants expressed confidence in recommending a smoking cessation plan, and only 12.5% reported possessing the behavioural therapy skills to help adult patients quit smoking. According to the categorisation of self-efficacy based on percentiles, 38.1% of the participants were at or below 33% percentiles and scored between 11 and 33.3 for self-efficacy (Table 2).

Table 2: Self-Efficacy of public dentists in Northeast Malaysia in providing smoking cessation intervention to adult patients (n = 160)

Item	n	%
I can ask adult patients questions related to smoking habits.		
Certainly	148	92.5
Probably	11	6.9
Probably Not	1	0.6
Certainly Not	0	0.0
I can give clear advice to adult patients who smoke.		
Certainly	97	60.6
Probably	60	37.5
Probably Not	3	1.9
Certainly Not	0	0.0
I can assess the readiness of adult patients to quit smoking.		
Certainly	57	35.6
Probably	93	58.1
Probably Not	10	6.3
Certainly Not	0	0.0
I can assess the level of dependence on nicotine in adult patients who smoke.		
Certainly	36	22.5
Probably	83	51.9
Probably Not	35	21.9
Certainly Not	6	3.8
I can motivate adult patients who are not interested in quitting smoking.		
Certainly	32	20.0
Probably	94	58.8
Probably Not	30	18.8
Certainly Not	4	2.5
I can assist adult patients who are interested in quitting smoking.		
Certainly	68	42.5
Probably	85	53.1
Probably Not	7	4.4
Certainly Not	0	0.0
I can give relevant advice to pregnant mothers and their partners to stop smoking.		
Certainly	88	55.0
Probably	63	39.4
Probably Not	9	5.6
Certainly Not	0	0.0
I can recommend a smoking cessation plan to adult patients who are ready to quit smoking.		
Certainly	62	38.8
Probably	88	55.0
Probably Not	9	5.6
Certainly Not	1	0.6
I have the behavioural therapy skills needed to help adult patients quit smoking.		
Certainly	20	12.5
Probably	71	44.4
Probably Not	50	31.3
Certainly Not	19	11.9
I have the skills to recommend the use of nicotine replacement therapy (NRT) in helping adult patients quit smoking.		
Certainly	9	5.6
Probably	74	46.3
Probably Not	48	30.0
Certainly Not	29	18.1
I can help adult patients who are quitting smoking deal with the urge to go back to smoking (relapse).		
Certainly	17	10.6
Probably	90	56.3
Probably Not	46	28.7
Certainly Not	7	4.4
Total Score of Self-Efficacy [Mean (SD)]	34.6(4.56)[a]	
Category of self-efficacy (%) [b]		
Low	61	38.1
Moderate	45	28.1
High	54	33.8

[a]Minimum score = 11.0, maximum score = 44.0.
[b]Low (below 33rd percentile)- scores were between 11.0 and 33.0; moderate (33rd-66th percentile)- scores were between 33.1 and 36.3; and high (66th and above percentile)- scores between 36.4 and 44.0.

Level of behaviour in providing smoking cessation intervention to adult patients

Table 3 shows that the majority of participants always ask adult patients if they smoke (46.3%). However, only 14.4% of participants inquired about the number of cigarettes

smoked daily by adult patients who were smokers. Only a few participants always offer smoking cessation advice to adult patients (16.9%) and pregnant woman and their partners (12.5%). Similarly, only a small percentage of participants always evaluate the readiness of adult patients to quit smoking (8.1%), assess nicotine dependence levels in adult patients who smoke (3.1%), and motivate adult patients who are indifferent to quitting smoking (6.9%). Only 5.0% of participants always refer adult patients who want to quit smoking to smoking cessation services and provide educational materials to adult patients who smoke. Finally, only 1.3% of participants always develop a smoking cessation plan for adult patients who are ready to quit smoking, and 0.6% always offer follow-up appointments to adult patients who have quit smoking. According to the categorisation of behaviour based on percentiles, 35.6% of participants were classified in the low behaviour category, representing those at or below the 33rd percentile.

Table 3: Behaviour of public dentists in Northeast Malaysia in providing smoking cessation intervention to adult patients (n = 160)

Item	n	%
Frequency of carrying out the following activities in the last three months:		
Ask adult patients if they smoke.		
Always	74	46.3
Often	67	41.9
Sometimes	17	10.6
Rarely	1	0.6
Never	1	0.6
Ask adult patients who smoke the number of cigarettes smoked per day.		
Always	23	14.4
Often	48	30.0
Sometimes	78	48.8
Rarely	8	5.0
Never	3	1.9
Giving smoking cessation advice to adult patients who smoke.		
Always	27	16.9
Often	61	38.1
Sometimes	59	36.9
Rarely	11	6.9
Never	2	1.3
Giving smoking cessation advice to pregnant women and their partners who smoke.		
Always	20	12.5
Often	36	22.5
Sometimes	58	36.3
Rarely	22	13.8
Never	24	15.0
Evaluating the readiness of adult patients to quit smoking.		
Always	13	8.1
Often	41	25.6
Sometimes	65	40.6
Rarely	28	17.5
Never	13	8.1
Assessing the degree of dependence on nicotine in adult patients who smoke.		
Always	5	3.1
Often	15	9.4
Sometimes	55	34.4
Rarely	36	22.5
Never	49	30.6
Motivating adult patients who are not interested in quitting smoking.		
Always	11	6.9
Often	40	25.0
Sometimes	57	35.6
Rarely	35	21.9
Never	17	10.6
Build a quit plan for adult patients who are ready to quit smoking.		
Always	2	1.3
Often	4	2.5
Sometimes	30	18.8
Rarely	31	19.4
Never	93	58.1
Refer adult patients who are ready to quit smoking to smoking cessation services.		
Always	8	5.0
Often	18	11.3
Sometimes	33	20.6
Rarely	38	23.8
Never	63	39.4
Provide smoking cessation education materials to adult patients who smoke		
Always	8	5.0
Often	15	9.4
Sometimes	49	30.6
Rarely	36	22.5
Never	52	32.5

Table 3: Behaviour of public dentists in Northeast Malaysia in providing smoking cessation intervention to adult patients (n = 160) (continued)

Item	n	%
Give follow-up appointments to adult patients who are quitting smoking.		
Always	1	0.6
Often	7	4.4
Sometimes	18	11.3
Rarely	22	13.8
Never	112	70.0
Total Score of Behaviour [Mean (SD)]	30.6 (7.10)[a]	
Category of Behaviour[b]		
Low	57	35.6
Moderate	49	30.6
High	54	33.8

[a]Minimum score = 11.0, maximum score = 55.0.
[b]Low (below 33rd percentile)- scores were between 11.0 and 26.0; moderate (33rd-66th percentile)- scores were between 26.1 and 33.3; and high (66th and above percentile)- scores between 33.4 and 55.0.

Factors associated with self-efficacy in providing smoking cessation intervention to adult patients

Table 4 shows that there was a significant association between gender and attended training with self-efficacy. There was a significantly higher self-efficacy in males with a mean (SD) score of 35.9 (2.91) compared to females (34.3 (4.79)), t(55.4) = 2.133, p = 0.037. There was also a significantly higher self-efficacy mean (SD) score in the participants who attended smoking cessation intervention training (36.1 (3.98)) than those who did not attend training (34.0 (4.65)), t(158) = 2.696, p = 0.008.

Table 4: Factors associated with self-efficacy in providing smoking cessation intervention to adult patients (n = 160)

Factors	n	mean	SD	t	p
Age					
≤ 35	134	34.7	4.56	0.575	0.566
≥ 36	26	34.1	4.67		
Gender					
Male	26	35.9	2.91	2.133	**0.037**
Female	134	34.3	4.79		
Ethnicity					
Malay	157	34.6	4.58	-0.158	0.875
Non-Malay	3	35.0	7.00		
Religion					
Muslim	157	34.6	4.58	-0.158	0.875
Non-Muslim	3	35.0	7.00		
Highest Qualification					
Bachelor	153	34.7	4.59	1.455	0.074
Bachelor and Master	7	32.1	3.18		
Undergraduate Training					
Local	89	34.8	4.01	0.497	0.620
International	71	34.4	5.20		
Smoking Status					
Ever Smoker	5	33.8	1.79	-0.391	0.696
Never Smoker	155	34.6	4.63		
Work Experience (Years)					
≤ 10	133	34.7	4.58	0.686	0.493
≥ 11	27	34.0	4.51		
Time Spent with Each Patient (Minutes)					
≤ 20	115	34.6	4.57	-0.137	0.891
≥ 21	45	34.6	4.61		
Percentage Of Adult Patients Smoking					
≤ 50.0%	120	34.6	4.66	-0.595	0.553
≥ 51.0%	29	35.2	4.22		
Availability Of Quit Smoking Clinic at Practise					
Yes	116	34.8	4.62	0.730	0.466
No/Not sure	44	34.2	4.44		
Attend Smoking Cessation Intervention Training					
Yes	44	36.1	3.98	2.696	**0.008**
No	116	34.0	4.65		

Factors associated with behaviour in providing smoking cessation intervention to adult patients

Table 5 shows that there was no significant association of demographic factors with behaviour. Nevertheless, even though there was no significant difference, the participants under 35 years of age, males, non-Malays, non-Muslims, never smoke, those who have been employed for less than ten years, estimated that 50.0% and more patients

smoke, and those who participated in smoking cessation intervention training tend to have higher behaviour scores.

Table 5: Factors associated with behaviour in providing smoking cessation intervention to adult patients (n = 160)

Factors	n	mean	SD	t	p
Age					
≤ 35	134	30.7	7.15	0.682	0.496
≥ 36	26	29.7	6.89		
Gender					
Male	26	31.1	7.40	0.403	0.688
Female	134	30.5	7.06		
Ethnicity					
Malay	157	30.5	7.14	-1.011	0.313
Non-Malay	3	34.7	2.52		
Religion					
Muslim	157	30.5	7.14	-1.011	0.313
Non-Muslim	3	34.7	2.52		
Highest Qualification					
Bachelor	153	30.7	7.10	1.417	0.079
Bachelor and Master	7	26.9	6.49		
Undergraduate Training					
Local	89	30.0	6.36	-1.056	0.293
International	71	31.2	7.92		
Smoking Status					
Ever Smoker	5	29.8	5.90	-0.243	0.808
Never Smoker	155	30.6	7.15		
Work Experience (Years)					
≤ 10	133	30.7	7.27	0.599	0.550
≥ 11	27	29.8	6.25		
Time Spent with Each Patient (Minutes)					
≤ 20	115	30.6	7.05	0.131	0.896
≥ 21	45	30.4	7.30		
Percentage Of Adult Patients Smoking					
≤ 50.0%	120	30.9	6.76	0.084	0.933
≥ 51.0%	29	30.8	8.42		
Availability Of Quit Smoking Clinic at Practise					
Yes	116	30.7	7.33	0.392	0.696
No/Not sure	44	30.2	6.49		
Attend Smoking Cessation Intervention Training					
Yes	44	32.0	7.71	1.560	0.121
No	116	30.0	6.81		

However, Table 6 shows that there was a significant moderate positive correlation between self-efficacy and behaviour in providing smoking cessation intervention for adult patients among the public dentists in Northeast Malaysia, r = 0.509, n = 160, p < 0.001.

Table 6: Correlation between self-efficacy and behaviour in providing smoking cessation intervention to adult patients (n = 160)

Variable [Mean (SD)]		r	Covariance	n	p
Self-Efficacy	**Behaviour**				
34.6(4.56)	30.6 (7.10)	0.509	16.491	160	**<0.001***

*Correlation is significant at the 0.01 level (2-tailed).

Discussion

The prevalence of smoking among dentists in this study aligns with a previous study finding among both public and private dentists in Malaysia, which reported a rate of 1.4% (22). This result holds significant importance, as healthcare providers have a responsibility to serve as role models for their patients (24). Additionally, dentists who smoke may view implementing smoking cessation intervention as a lower priority than providing dental treatment (29).

In terms of self-efficacy, only 5.6% of participants in this study felt confident in their ability to recommend the use of NRT. A previous study conducted in Malaysia found that 23.4% of public dentists felt confident in their ability to make decisions regarding the use of NRT (22). The lack of confidence among dentists in providing NRT may be due to

limited exposure to it. Currently, dentists actively provide smoking cessation intervention to school students (30), whereas NRT is not offered as a smoking cessation method due to contraindications (31).

This study revealed that most of the participants exhibited low self-efficacy in providing smoking cessation intervention. They had lower self-efficacy compared to their healthcare provider counterparts, such as doctors, pharmacists, medical assistants, and nurses who work in public health clinics in Malaysia (32). Additionally, participants who attended training demonstrated significantly higher self-efficacy compared to those who did not participate in training. This finding may provide insight into the reasons for the observed lack of confidence among dentists (33).

This study also showed that male participants had significantly higher self-efficacy in providing smoking cessation intervention to adult patients compared to their female counterparts. A study in Canada revealed that male doctors were twice as confident in sharing information as female doctors. Gender is considered to be a significant factor that moderates self-efficacy, with males generally perceived as more competent, task-oriented, and assertive, which allows them to gain more experience and enhance their problem-solving skills, which further ultimately boosts their self-efficacy (34).

Whereas, regarding behaviour, this study found that fewer participants always provided smoking cessation education materials to adult patients who smoke compared to a previous study conducted among dentists in public dental clinics in Selangor, Kuala Lumpur, Pahang, and Terengganu, Malaysia (20). Providing self-help materials is crucial to enhance patients' knowledge and motivation to quit smoking, especially when time constraints prevent dentists from explaining the harms of smoking and the benefits of quitting. Therefore, it is better to offer educational materials than no interventions at all (35). Utilising educational materials in smoking cessation counselling can effectively reduce nicotine dependence (36) and increase patients' odds of quitting smoking in primary care (37). However, the limited availability of educational materials on smoking cessation in dental clinics may be one of the reasons why some dentists do not provide them to patients (38).

Based on this study, in general, most of the participants had a low level of behaviour towards providing smoking cessation intervention for adult patients. Participants in this study did not always provide smoking cessation intervention, similar to a study finding conducted among doctors at public primary health clinics located in Petaling, Klang, and Hulu Langat, Malaysia (39). The lack of time, as reported in previous studies among dentists in various Malaysian regions, could be a possible contributing factor (20, 22, 40) along with insufficient educational materials in the clinic and lack of knowledge of 5A (Ask, Advise, Assess, Assist, and Arrange) and 5R (Relevance, Risks, Rewards, Roadblocks, and Repetition) smoking cessation methods (39). Therefore, it is suggested that policymakers should review policies, allocate funding, and provide training to dentists to deliver straightforward, accessible, and flexible smoking cessation interventions that acknowledge smoking as a prevalent risk factor for both oral health and general health problems (41).

Another possibility is that patient factors, including resistance (38) and disinterest (42), can pose challenges to the delivery of smoking cessation intervention. In some cases, patients may not view quitting smoking as a concern during their primary care clinic visit (43), and they may not be fully concerned about the negative health effects of smoking, which impedes the delivery of smoking cessation intervention (44).

In addition, this study also showed that there was no significant association between behaviour in smoking cessation intervention and variables like age, gender, and work experience. Similarly, a study conducted on doctors, pharmacists, medical assistants, and nurses in Malaysia found that age, gender, and work experience did not have a significant association with good smoking cessation intervention behaviour (24). However, while this study did not reveal a significant association factor, it did observe that male participants displayed a higher smoking cessation intervention behaviour compared to their female counterparts, which aligned with a prior study conducted among healthcare professionals in Malaysia (24). There could be social factors contributing to the observed gender gap, as female healthcare providers might experience some discomfort when talking about smoking habits with adult male patients, which could result in lower rates of smoking cessation intervention behaviour among them (45). Additionally, male smokers outnumbered female smokers among adults in Malaysia (1).

While attending smoking cessation intervention training was shown to have a significant association with smoking cessation intervention self-efficacy, this study discovered that there was no significant association between attending training and smoking cessation intervention behaviour. This result differs from a previous study of doctors employed in public primary health clinics in Malaysia. This discovery holds important information for the implementation of the smoking cessation intervention program for public dentists in Malaysia (23). Self-efficacy may have a stronger correlation with smoking cessation intervention behaviour than attending training. A comprehensive study conducted in Malaysia, comprising participants from various healthcare organisations, including doctors, pharmacists, medical assistants and nurses, found that those with high self-efficacy were five times more likely to exhibit good behaviour towards smoking cessation intervention (24). Moreover, this study also established a significant correlation between participants' behaviour and their self-efficacy - specifically, their behaviour improved as their self-efficacy levels increased.

Strength and limitation

To the author's knowledge, this study represents the first assessment of smoking cessation intervention for adult patients among dentists in public primary dental clinics in the Northeastern region of Malaysia. As a result, this study may provide valuable insights that can inform the development of future smoking cessation programs. Additionally, the use of the 5A smoking cessation method in this study to assess dentists' self-efficacy and behaviour in providing smoking cessation intervention was particularly noteworthy, as this method is widely regarded as appropriate for healthcare professionals.

Certain limitations to this study should be considered. For example, the participation of dentists in this study was voluntary. As a result, there may be some bias towards positive outcomes, particularly with regard to smoking status and self-efficacy. Moreover all outcomes were based on self-reported data, which may be subject to over or under-reporting, especially when it comes to dentists' behaviour towards providing adult smoking cessation. However, given that smoking cessation is not yet widely practised in public primary dental clinics during this study, there may be limited data available to examine dentist behaviour in relation to this intervention.

Besides, the majority of participants in this study were Malay and female. As a result, the findings may reflect certain biases towards these factors. To mitigate this, it is recommended that future studies employ proportional sampling methods. Last but not least the sample size in this study may not have been sufficient. To ensure greater precision and better representation of the population, a larger sample size is proposed for future studies.

Conclusion

In conclusion, most public dentists in in this study exhibited low self-efficacy and demonstrated limited behaviour in providing smoking cessation intervention to adult patients. Factors associated with self-efficacy included gender and attendance at smoking cessation intervention training. A moderate positive correlation was identified between self-efficacy and behaviour towards providing smoking cessation intervention to adult patients. Therefore, it is recommended that interventions and training programs focusing on providing on smoking cessation be offered to dentists. This may enhance both their self-efficacy and behavioural tendencies in providing smoking cessation interventions for adult patients.

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Competing interests

The authors declare that they have no competing interests.

Ethical Clearance

This study was granted ethical approval by the Medical Research and Ethics Committee (MREC) of the Ministry of Health (MOH) Malaysia (NMRR ID -22-01191- VUM (IIR)) and the Human Research Ethics Committee of Universiti Sains Malaysia (USM/JEPeM/22010002). The consent was obtained from all participants.

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