

## Knowledge and Perceptions Regarding Tobacco Harm Reduction among Dentists in West Java, Indonesia

Aliyya Puteri Ramadhani<sup>1</sup>, Budhi Cahya Prasetyo<sup>2</sup>, Amaliya Amaliya<sup>2\*</sup>, Konstantinos E. Farsalinos<sup>3</sup>

1. Dental Student, Faculty of Dentistry, Padjadjaran University, Indonesia.

2. Lecturer, Department of Periodontology, Faculty of Dentistry, Padjadjaran University, Indonesia.

3. Researcher, Departement of Cardiology, Onassis Cardiac Surgery Center, Greece.

### Abstract

This study aimed to determine the knowledge and perceptions of dentists regarding the tobacco harm reduction program in West Java, Indonesia. A survey was conducted to dentists in West Java with an online questionnaire. The questionnaire contained various closed-ended questions covering the knowledge and perceptions of dentists regarding tobacco harm reduction.

The respondents' knowledge score was calculated by giving 1 point for each correct answer. A total of 290 responses were included in the analysis. The results showed that the majority of the respondents believed combining nicotine replacement therapies (NRT) with counseling results in a high success rate in smoking cessation (75.5%). However, only a small percentage stated that one of the tobacco harm reduction products, namely e-cigarettes, is effective in replacing conventional cigarettes (25.9%). Although the majority of the respondents still had low knowledge related to the program (67.2%), they agreed that tobacco control activities are the duty of dentists (69.5%) and that their practice is an ideal place to conduct these events (72.0%).

The perception of dentists regarding tobacco control in West Java was generally quite good. However, their lack of knowledge concerning the reduction program could be a barrier to effectively implementing the program.

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### Introduction

Smoking is an easily-founded habit in many developing countries, including in Indonesia. Although numerous education and information on its dangers have been given to the public, the smoker prevalence in this country has increased yearly. In 2016, World Health Organization (WHO) estimated the prevalence of adult smokers in Indonesia to be 39.2%, which is expected to increase to 41% by 2020.<sup>1</sup> This figure puts Indonesia in first place with the highest number of smokers in Southeast Asia.<sup>2</sup> Furthermore, based on the data from the latest Basic Health Research report issued by the Indonesian Ministry of Health in 2018, West Java

is the province with the highest prevalence of active smokers, at a value of 27%.<sup>3</sup>

Moreover, smoking causes various pathological effects in the oral cavity starting from aesthetic problems, including discoloration of teeth and restorations, staining, to the most worrying, which is neoplasms as well as the emerging leukoplakia and oral cancer.<sup>4-6</sup> It is also a major cause of adult periodontitis—including premature tooth loss, post-operative wounds that do not heal, ANUG, periodontal pocket formation, poor treatment prognosis, implant failure, tooth mobility, and gingival recession.<sup>7,8</sup> A cross sectional study in Indonesia also reported that the smokers group of TMD patients experienced higher severity of pain compared to non-smokers group.<sup>9</sup> In addition, loss of taste sensation, tooth abrasion, halitosis, and gingival pigmentation also occur due to smoking.<sup>5,8</sup>

Data previously disclosed by WHO in the Global Adults Tobacco Survey (2012), showed the difficulty of quitting smoking in Indonesia.<sup>10</sup> The survey revealed that only 21% of the group

#### \*Corresponding author:

Amaliya Amaliya  
Lecturer, Department of Periodontology,  
Faculty of Dentistry, Padjadjaran University, Indonesia  
E-mail: amaliya@fkg.unpad.ac.id

interested in quitting smoking were successful through counseling or other methods with the help of professional health workers.<sup>10</sup> Therefore, implementing a control program—such as tobacco harm reduction, is necessary to reduce the potential for disease and death caused by tobacco consumption.<sup>11</sup> The tobacco harm reduction program has a strategy to provide counseling and advising the smokers who could not or do not want to quit to replace their cigarette consumption with pharmacological products or smokeless tobacco, hence reducing the potential dangers and health risks posed.<sup>12</sup> Nicotine Replacement Therapy (NRT), which includes nicotine patches, tablets, and chewing gum are some of the tobacco harm reduction products currently recommended by various clinical guidelines.<sup>13</sup> However, there are other products currently available in Indonesia, such as snus, heat not burn tobacco, and e-cigarettes which could also be used as an option. Tobacco harm reduction program acts as a complementary method to tobacco control activities, including use prevention measures and smoking cessation counseling.<sup>14</sup> The tobacco harm reduction program could be implemented effectively if it is supported by various parties, one of which is a dentist as a professional health worker. Unfortunately, in Indonesia, there is only small enlightenment about the importance of dentists' role in controlling tobacco and there has not been much research on this subject.

Based on data released from the statistics page of the Indonesian Dental Association [PDGI]—the only official professional dentistry organization in the country, West Java ranks third as the province with the highest number of dentists (as of 2 November 2020).<sup>15</sup> Therefore, due to the increasing smoker prevalence and a large number of available dentists in West Java, these health professionals are expected to play an effective role in tobacco control activities by implementing the tobacco harm reduction program. Health professionals, including dentists, have a positive stigma and tend to get high respect and trust from the community. Therefore, they become the most important information source for providing education and counseling about the relative risks of various tobacco products for smokers.<sup>16</sup> According to a previous study, brief advice given by a dentist could increase the success of a smoking cessation program.<sup>17</sup> The success and effectiveness of

these efforts are very dependent on their basic knowledge of the smoking effects on health, methods, and any processed tobacco products that could be used in implementing the program.<sup>16</sup> However, evidence from several recent studies shows that the knowledge and perceptions of health workers regarding smoking and various processed tobacco products were mostly still inaccurate and not following the existing facts.<sup>16</sup>

Generally, knowledge is defined as one's belief about a fact, the reach of his information, theoretical or practical understanding of a subject, or skills acquired by an individual through certain education or experience.<sup>18</sup> Consequently, this study focuses on the knowledge of dentists regarding tobacco harm reduction and illustrates how much do the dentists know about the smoking effects on the oral cavity and methods, as well as detailed information related to tobacco products used in implementing the program—such as NRT and e-cigarettes. Perception is defined as a process of responding and interpreting impressions or information received by the five senses, where a person's interpretation could vary from the existing reality.<sup>19</sup>

In this study, the perception variables encompass a description of dentists' perception about the application and use of tobacco harm reduction products in the smoking cessation program, as well as their views about involvement, and the implementation of control activities in dental practice.

Moysidou *et al.* (2016) conducted a survey using a questionnaire in Greece to determine the perception and knowledge level about the tobacco harm reduction program among health professionals, including dentists.<sup>16</sup> The results showed that the knowledge level of health professionals regarding this problem was still low, with the average number of respondents' knowledge score was 7.7 points out of a total of 16.<sup>16</sup> In Indonesia, the study that evaluating the perceptions, knowledge, roles, and attitudes of health professionals concerning tobacco harm reduction has never been performed on dentists. Therefore, this survey was conducted to cognize the knowledge and perceptions of convenient dentist samples regarding the tobacco harm reduction program in West Java, Indonesia.

## Materials and methods

This is a descriptive study conducted by survey method between April and May 2021 on a population of dentists registered with the Indonesian dental association (PDGI) e-certification in the West Java Region, which consists of 23 regency and city branches. A convenience sampling technique was used to select members of the available population that fit the inclusion criteria. The inclusion criteria comprised of dentists registered with the PDGI e-certification in the West Java Province willing to be respondents. This study obtained a permit from the Indonesian dental association (PDGI) and ethical approval from the Research Ethics Committee of Padjadjaran University, Indonesia (ethical approval number 121/UN6.KEP/EC/2021).

The survey was conducted using a questionnaire from a previous study by Moysidou *et al.* (2016) in Greece and adapted to the competence of dentists in Indonesia.<sup>16</sup> Subsequently, the process of translating the questionnaire into Indonesian was performed using the backward translate method by The British Institute (TBI) to ensure there was a context similarity and appropriateness of each translated question. This survey was uploaded to an online tool known as Google Forms and was divided into three main parts, namely: (1) brief information about the study and respondents' consent; (2) respondents' demographic data, including age, gender, qualifications, work duration, smoking habits, and origin of the PDGI branch in West Java Region; (3) knowledge and perception regarding tobacco harm reduction. Questions covering knowledge asked about how smoking affects the oral cavity; currently available harm reduction products in Indonesia; and detailed facts about the products—such as NRT and e-cigarettes including their relative risk and dependence potential compared to smoking. The reason for asking the detailed information regarding NRT was that this product is currently most recommended as a first-line medicine by some clinical guidelines to be used as pharmacotherapies for the unwilling or unable to quit smokers. Concerning e-cigarettes, our purpose was to ensure that dentists had scientific-based knowledge about this novel—yet popular product, so they would provide the correct information and advise the smokers to

use this product as the substitute for smoking. Also, the further effective role of dentists in implementing the tobacco harm reduction program is very reliant on their basic knowledge about the products that could be used. Finally, the participants were asked about their perceptions relating to the involvement of dentists in tobacco control.

The validity and reliability of the questionnaire were tested by a preliminary study of 20 dentists registered with the PDGI e-certification before the questionnaire was distributed online. Furthermore, the validity test was conducted using the Pearson Moment Product Correlation formula (Pearson's  $r$  knowledge = 0.529–0.865;  $r$  knowledge table = 0.514 &  $r$  perception = 0.834–0.904;  $r$  perception table = 0.811). Then, the reliability test was performed using the Cronbach Alpha method ( $\alpha$  knowledge = 0.892 & perception = 0.897). The reliability test was conducted with a significance level of  $\alpha = 0.6$ . The final design of the valid and reliable questionnaire consisted of 16 questions, including 12 related to knowledge and 4 to determine the dentists' perceptions of the program.

Invitations containing brief information related to the study along with links to questionnaire pages were distributed online to all dentists in West Java with the help of the PDGI in this Region through the WhatsApp application. Consequently, data analysis was performed using the univariate analysis method, and the results were displayed as percentage figures and frequency distribution of each variable. The analysis began with categorizing the data according to the demographic characteristics of the respondents. Subsequently, the knowledge score of each respondent was calculated by giving 1 point for every correct answer and 0 for unanswered questions with no deduction for wrong responses. The respondents were further grouped into three categories, including good, sufficient, and poor, based on the knowledge score. Additionally, comparative tests of these scores were conducted between respondents from each category as an additional analysis to determine the relationship between various demographic characteristics and knowledge scores. The correlative tests were performed using the Mann-Whitney U and Kruskal-Wallis methods because the data were not normally distributed. Significant differences between each

tested category group were determined when a p-value of <0.05 was obtained from the results. All of the data analyses were conducted using the IBM SPSS Statistic for Windows Versions 25.0 (IBM Corp., Armonk, N.Y., USA).

### Results

In this study, 2 of the 292 respondents stated they did not agree to participate, therefore only 290 responses were involved in the analysis.

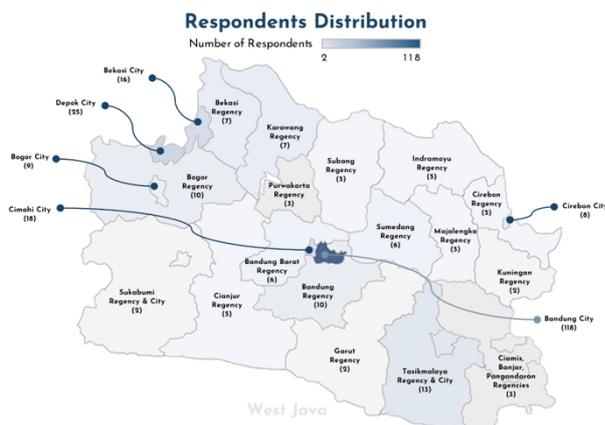
Participant Characteristics (n=290)	N (%)
<b>Age</b>	
<30 years	65 (22.4%)
>30 years	225 (77.6%)
<b>Gender</b>	
Males	72 (24.8%)
Females	218 (75.2%)
<b>Qualification</b>	
General dentist	238 (82.1%)
Specialist dentist	52 (17.9%)
<b>Years of working</b>	
< 5 years	70 (24.1%)
5–10 years	60 (20.7%)
>10 years	160 (55.2%)
<b>Smokers</b>	
Yes	15 (5.2%)
No	275 (94.8%)

**Table 1.** Characteristics of all survey participants.

(82.1%) while others were specialists (17.9%). Based on the duration of work, respondents were categorized into three groups, including those that had worked for more than 10 years (55.2%), 5–10 years (20.7%), and less than 5 years (24.1%). Only a small proportion of the respondents had a smoking habit (5.2%), as shown in Table 1.

Origin of PDGI Branch in West Java Region	N (%)
Bandung Regency	10 (3.4%)
Bandung Barat Regency	6 (2.1%)
Bekasi Regency	7 (2.4%)
Bogor Regency	10 (3.4%)
Ciamis, Banjar, Pangandaran Regencies	3 (1.0%)
Cianjur Regency	5 (1.7%)
Cirebon Regency	5 (1.7%)
Sukabumi Regency and City	2 (0.7%)
Tasikmalaya Regency and City	13 (4.5%)
Garut Regency	2 (0.7%)
Indramayu Regency	5 (1.7%)
Karawang Regency	7 (2.4%)
Kuningan Regency	2 (0.7%)
Majalengka Regency	5 (1.7%)
Purwakarta Regency	3 (1.0%)
Subang Regency	5 (1.7%)
Sumedang Regency	6 (2.1%)
Bandung City	118 (40.7%)
Bekasi City	16 (5.5%)
Bogor City	9 (3.1%)
Cimahi City	18 (6.2%)
Cirebon City	8 (2.8%)
Depok City	25 (8.6%)
<b>Total</b>	<b>290 (100.0%)</b>

**Table 2.** Respondents' distribution based on the origin of Indonesian dental association (PDGI) regency and city branches in the West Java region.



**Figure 1.** Thematic Map of Respondents' Distribution.

Table 1 shows the demographic characteristics of the respondents. Respondents above 30 years had a larger proportion (77.6%) compared to those below (22.4%), and most of the respondents were female (75.2%). The majority had qualifications as general dentists

Figure 1 shows the respondent distribution based on the origin from the PDGI branches in West Java Province. A minimum of 2 dentists was represented from each regency and city, with the majority amounting to 118 dentists from Bandung city (40.7%). More detailed data regarding the number of respondents based on the PDGI regency and city branches are shown in the Table 2.

Responses of the Participants (n=290)	N (%)
<b>Q1. The main factor that generates periodontal disease due to smoking is:</b>	
Smoking impairs the buffering capacity of saliva.	81 (27.9%)

Smoking reduces the number of <i>Actinomyces spp.</i> in the oral mucosa.	17 (5.9%)
Smoking causes vasodilation of blood vessels in the gingiva.	147 (50.7%)
Smoking increases the pH of saliva.	45 (15.5%)
<b>Q2. Tobacco harm reduction product that is currently unavailable in Indonesia:</b>	
Snus	102 (35.2%)
Nicotine inhaler	100 (34.5%)
E-cigarettes	25 (8.6%)
Heat not burn tobacco	63 (21.7%)
<b>Q3. Compared to smoking, the health risk of nicotine replacement therapies (NRT) is:</b>	
Higher	33 (11.4%)
Equal	62 (21.4%)
Lower	126 (43.4%)
Do not know	69 (23.8%)
<b>Q4. Which of the following is correct concerning nicotine replacement therapies/NRT?</b>	
They can only be consumed by >18 years old smokers.	41 (14.1%)
There are NRT that can remove tooth stains caused by smoking.	117 (40.3%)
They cannot be obtained without a prescription.	82 (28.3%)
They should not be consumed by people with cardiovascular disease.	50 (17.2%)
<b>Q5. According to the literature, the success rate of nicotine replacement therapies/NRT in smoking cessation at one year follow up is:</b>	
> 50%	102 (35.2%)
30-40%	78 (26.9%)
10-30%	79 (27.2%)
< 10 %	31 (10.7%)
<b>Q6. Origin of nicotine in nicotine replacement therapies/NRT:</b>	
Tobacco-extracted	82 (28.3%)
Synthetically-produced	208 (71.7%)
<b>Q7. Can pregnant smokers be given nicotine replacement therapies/NRT?</b>	
Yes	88 (30.3%)
No	102 (69.7%)
<b>Q8. Compared to smoking, the dependence potential of nicotine replacement therapies/NRT is:</b>	
Higher	16 (5.5%)
Equal	79 (27.2%)
Lower	155 (53.4%)
Do not know	40 (13.8%)

<b>Q9. Compared to smoking, the risk of malignancy in the oral cavity due to e-cigarette is:</b>	
Higher	56 (19.3%)
Equal	111 (38.3%)
Lower	87 (30.0%)
Do not know	36 (12.4%)
<b>Q10. Compared to smoking, the dependence potential of e-cigarette is:</b>	
Higher	33 (11.4%)
Equal	167 (57.6%)
Lower	67 (23.1%)
Do not know	23 (7.9%)
<b>Q11. Origin of nicotine in e-cigarettes:</b>	
Tobacco-extracted	70 (24.1%)
Synthetically-produced	220 (75.9%)
<b>Q12. Which of the following is correct concerning e-cigarettes?</b>	
They contain tobacco.	46 (15.9%)
There is combustion.	83 (28.6%)
E-liquid ingredients are approved for inhalation.	58 (20.0%)
There are e-cigarettes without nicotine.	103 (35.5%)
<b>Q13. Which of the following has a higher success rate in smoking cessation/ smoking reduction?</b>	
Nicotine Replacement Therapy /NRT	25 (8.6%)
Counseling	31 (10.7%)
Both	219 (75.5%)
Do not know	15 (5.2%)
<b>Q14. Do you consider e-cigarettes effective in substituting smoking?</b>	
Yes	75 (25.9%)
No	2215 (74.1%)
<b>Q15. Do you consider that being involved in tobacco control activity is one of dentist's duties?</b>	
Yes	198 (68.3%)
No	92 (31.7%)
<b>Q16. Do you consider that dental office is an ideal place for implementing tobacco control activities?</b>	
Yes	207 (71.4%)
No	83 (28.6%)

**Table 3.** Descriptive analysis for participants' responses.

Table 3 shows the descriptive analysis results, where respondents were asked questions about the harm arising from smoking in

periodontal tissues. Below 30% responded correctly that smoking interferes with the buffering capacity of saliva. There was only 34.5% of the respondents selected the right answer—that is nicotine inhaler, when asked a question on the tobacco harm reduction products that currently unavailable in Indonesia.

Category of Respondent Knowledge (n=290)	N (%)
Good (Score 9–12)	3 (1,0%)
Sufficient (Score 5–9)	92 (31,8%)
Poor (Score 0–4)	195 (67,2%)

**Table 4.** Category of respondent knowledge.

The majority estimated that the health risks arising from the use of nicotine replacement therapy (NRT) are lower than smoking (43.4%), while more than half were aware that the potential dependence on this treatment is lower (53.4%). Moreover, most of the respondents already know the facts that there is available NRT which capable of reducing stains caused by smoking on the teeth (40.3%). However, almost 90% were still mistaken about the success rate of the smoking cessation program. Only 10.7% correctly estimated that the success rate of NRT in smoking cessation programs is less than 10% at one-year follow-up. Furthermore, the majority believed that nicotine contained in NRT is synthetically produced (71.7%) and NRT could not be given to pregnant smokers (69.7%).

Likewise, most of the questions related to e-cigarettes were not answered correctly by respondents. Some believed the malignancy risk due to the use of e-cigarettes is similar to smoking (38.3%) while more than half considered the potential dependence of using this product is similar (57.6%). A majority of the respondents did not know the exact facts regarding e-cigarettes, where only a small percentage answered correctly that the nicotine in this device comes from extracted tobacco (24.1%). Of the total respondents, only 35.5% understood that non-nicotine e-cigarette devices are available. Meanwhile, the others answered that there is combustion in e-cigarettes (28.6%) and that it contains tobacco (15.9%) as well as the ingredients in e-liquids are allowed to be inhaled (20.0 %).

About three-quarters of the respondents perceived that combining NRT with counseling would lead to a high rate of success in smoking

reduction and cessation programs (75.5%). However, only a small percentage (25.9%) stated that one of the tobacco harm reduction products, namely e-cigarettes, is effective in replacing the conventional one (combustible cigarette). Moreover, a majority of the respondents agreed that control activities, such as the tobacco harm reduction program, are the duty of dentists (68.3%) and their office is an ideal place to perform these activities (71.4%).

#### Knowledge Score

To generalize the description of respondents' knowledge about the tobacco harm reduction program, each of them was given a “knowledge score” and 12 questions were used to calculate the score (questions number 1–12). Each correct answer was given 1 point and 0 for incorrect or unanswered responses, hence the maximum score was 12 points. The average score of all respondents was 3.8 points (SD ± 2.0).

Based on the knowledge score, the respondents were grouped into 3 categories, where the majority had low knowledge regarding the tobacco harm reduction program (67.2%). Table 4 shows the results of grouping the respondents' knowledge levels. Subsequently, a comparative test of the demographic characteristics and knowledge scores was conducted between each category. There was no relationship between these factors and no statistically significant difference was observed (p-value = 0.218–0.936).

### **Discussion**

According to the results, the vast majority of respondents had positive and favorable perceptions regarding the involvement of dentists in tobacco control activities. Also, most were aware that the control of this substance is part of a dentist's job and that their office is an appropriate place to implement a tobacco control program. Moreover, dentists have several opportunities to reduce smoking prevalence by providing support, motivation, and counseling regarding smoking reduction and cessation because dental treatments generally require several visits.<sup>20</sup> According to a study by Lamster & Eves, the number of patients coming for follow-up care visits at dental health facilities was two times greater than at public health facilities.<sup>21</sup> Therefore, dental clinics and practices are

considered to be an ideal and effective place to help patients reduce and stop their smoking habits.<sup>22</sup> The many adverse effects in the oral cavity due to smoking habits also strengthen the importance of dentists' role in the tobacco harm reduction program.<sup>20</sup> Moreover, in several countries, such as Japan and the United States, there have been many exposures from dentist associations regarding their involvements in smoking cessation services through various methods, including nicotine substitution, the use of e-cigarettes, and counseling programs.<sup>22</sup>

The tobacco harm reduction concept agrees that the ideal attitude is against the substance use and consumption, yet the alternative methods to reduce the harm among smokers should be accepted and considered.<sup>12</sup> Likewise, the high prevalence of smokers and the difficulty of stopping this habit are other reasons that the options to reduce harm and adverse effects arising from tobacco consumption may be a solution to minimize the smoking-related health problems.<sup>12</sup> Unfortunately, this study results indicate that the respondents' knowledge of tobacco harm reduction was still low and the majority did not know what products are currently available in Indonesia. However, various products, such as e-cigarettes, snus, and several NRT dosage forms—including nicotine patches and chewing gum, could be purchased easily on various shopping websites.

The finding from this present study is in agreement with other studies, which indicate that the majority of respondents had the correct perception that NRT, especially when combined with counseling, has the highest success rate in smoking cessation and reduction programs.<sup>23-25</sup> This has led to several clinical guidelines recommending NRT as the first-line medicine for smokers who need pharmacological therapy to stop smoking.<sup>13</sup> The nicotine in NRT is not as dangerous as those in conventional cigarettes, because there is no combustion process, smoke production, neither the formation of other harmful substances such as tar and carbon monoxide.<sup>26</sup> Although many clinical guidelines state that this treatment could be consumed by adolescents with difficulty in quitting smoking<sup>27</sup>, its use should remain under the supervision of a health professional. Moreover, several studies prove NRT tends to be "safer" for consumption by pregnant women compared to cigarettes.<sup>28,29</sup> The improvement of the aesthetic condition of usually-

stained teeth due to smoking through the use of nicotine gum could motivates dentists to generate patients' interest in switching to NRT.<sup>30</sup> Furthermore, a change in the level of tooth color was discovered after switching to nicotine gum to a significantly whiter appearance within a few weeks in a randomized control study.<sup>30</sup>

E-cigarette or vape is tobacco harm reduction product that currently popular among the public, especially smokers who do not want to get help from health workers to stop this habit.<sup>31</sup> A study has proven that this device is at least 95% less harmful to health than conventional cigarettes with combustion.<sup>32</sup> Based on a cytological study of the oral mucosa, the risk of oral cancer due to e-cigarette consumption was discovered to be lower.<sup>33</sup> Also, these devices are proven to have lower or even no nicotine levels in comparison to conventional cigarettes.<sup>34,35</sup> Furthermore, the half-life cycle and elimination time of nicotine from the body are significantly longer in e-cigarettes, therefore these devices are consistently considered to have a lower dependence effect.<sup>36,37</sup> Several case studies have reported the benefits of using e-cigarettes in helping smokers who fail to quit by other methods.<sup>38</sup> In the UK, the growth in e-cigarette use was accompanied by a decrease in smoking prevalence and no increase in tobacco consumption rates.<sup>38</sup> These studies show the effectiveness of the device in replacing conventional cigarettes. However, a vast majority of the respondents from this present study in West Java still perceived that e-cigarette consumption could not effectively replace conventional cigarettes.

Our study limitation is that the sample size was relatively small and only about 5.8% of the total dentists registered in the PDGI e-certification of the West Java Region participated. Also, due to the limited time, the convenience sampling technique was used. However, to reduce the possibility of bias in the data obtained, each respondent's origin from the PDGI branch was monitored, hence dentists represented each regency and city branch in West Java. The knowledge score was calculated from the answers of each respondent to the questionnaire, which does not cover all aspects of scientific information regarding the tobacco harm reduction program. Therefore, the score was only used as an estimate to get an overview of respondents' knowledge based on the questions listed on the

questionnaire.

The finding regarding the dentist perception in West Java is consistent with the previous studies conducted by Alajmi *et al.* (2017) in Saudi Arabia and Alblowi (2021) in India where most respondents had a positive perception that tobacco control activities are part of a dentist's duty.<sup>39,40</sup> However, this is different from a study by Uti & Sofola, (2011), which shows most dentists in Nigeria had negative perceptions regarding their involvement in tobacco control programs.<sup>41</sup> Moreover, evidence from previous studies shows that the dentists' knowledge regarding one of the tobacco harm reduction products, namely NRT was still low.<sup>42</sup> Meanwhile, no study assessing dentists' knowledge of e-cigarettes has been discovered, because most were conducted on dental students. Some of these study results are in agreement with each other, where most of the respondents did not have sufficient knowledge about e-cigarettes.<sup>43,44</sup> The findings of the current study in West Java are consistent with those study results, where the majority of dentists had a deficit knowledge regarding the implementation of the tobacco harm reduction program and the products that could be used. A majority of dentists in West Java still believed that the potential dependence and health risks posed by e-cigarettes are similar to their conventional counterparts. The respondents also tend to overestimate the success rate of NRT in smoking cessation.

Differences in the knowledge level between each category of demographic characteristics—including smoking habits, were examined through a comparative test between knowledge scores. This was performed with the assumption that the smoker group has broader knowledge and experience related to smoking cessation programs, such as the use of tobacco harm reduction products. However, from the results, there were no statistically significant differences between each group of demographic characteristics, hence both groups indicated the low knowledge regarding the program.

The poor knowledge of dentists regarding the tobacco harm reduction in West Java may be due to the absence of materials related to this program in their education curriculum. The lack of training, education, and support from the authorities regarding the program implementation, as well as the persistence of views against the use of products containing

nicotine, might also affect the beliefs of health professionals.<sup>45</sup> In the Philippines, a group of dental and oral health professionals has recommended the dentists advise smoking patients who cannot or do not want to quit smoking to switch to tobacco harm reduction products, such as e-cigarettes, NRT, or non-combustible tobacco products to reduce the risk health problems arising from tobacco consumption.<sup>46</sup> This suggests that further in-depth study should be conducted regarding the role and effectiveness of dentist involvement in the implementation of the tobacco harm reduction program in the control activities in Indonesia. Furthermore, dentists should acquire certain proper training programs to obtain the right and detailed information that comply with the recent scientific evidence about tobacco control, such as the tobacco harm reduction program along with the products that could be used.

## Conclusions

The perception of dentists in West Java regarding the tobacco harm reduction program is generally quite good but had not been supported by sufficient knowledge. Accordingly, low knowledge regarding the availability and facts about the tobacco harm reduction products that could be used—such as NRT and e-cigarettes, might be a barrier for dentists to participate effectively in the program implementation.

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## Declaration of Interest

The authors report no conflict of interest.

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