ORIGINAL ARTICLE

Belief and Attitude of Primary Healthcare Providers Toward Electronic Cigarettes in Denpasar, Bali, Indonesia

Putu Ayu Swandewi Astuti[1,2], Ni Made Dian Kurniasari[1,2], I Wayan Gede Artawan Ekaputra[1,2], Ketut Hari Mulyawan[1,2], Ketut Suarjana[1,2], I Made Kerta Duana[1,2], I Gusti Made Gde Surya Chandra Trapika[3], Anak Agung Ayu Dyah Pradnyadewi[2]

[1] Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University, Kota Denpasar, Bali 80232, Indonesia
[2] Center for NCDs, Tobacco Control and Lung Health (CENTRAL), Udayana University, Kabupaten Badung, Bali 80361, Indonesia
[3] Department of Pharmacology and Therapy, Faculty of Medicine, Udayana University, Kabupaten Badung, Bali 80361, Indonesia

ABSTRACT

Introduction: Indonesia faces high burden on health and socio-economic from smoking. Besides conventional cigarettes, there is an increasing use of electronic cigarettes. This study aims to explore primary health professionals' belief and attitude toward electronic cigarettes. **Methods:** We conducted a cross-sectional survey in Bali, Indonesia between October, and November 2021. A 185 sample of general practitioners (GP) and dentists working at primary health care were invited through consecutive and snowballing technique. Variables collected during the study were sociodemographic and clinical practice characteristics, smoking status, intention to quit smoking and, their belief and attitude toward electronic cigarettes. Data was analyzed descriptively. **Results:** The average age of the primary health care providers involved in the study was 37.65 years, 60% of them were female and a GP with median length of professional works 10 years. Only 3 (1.62%) were current smokers and 6 (3.24%) were ex-smokers, while 0.54% reported using electronic cigarettes. The majority of respondents agreed in the negative impacts of electronic cigarettes, however, 11.9% of them agree that electronic cigarettes are less dangerous than conventional cigarettes, 13.4% agree it can be used as smoking cessation and 9.2% agree that it should be recommended as a substitute of smoking. **Conclusion:** Primary health care professionals viewed electronic cigarettes as potential risk for health but some of them have neutral and less positive attitude, therefore, it is necessary to provide adequate information based on the growing evidence of negative impacts of electronic cigarettes.
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Corresponding Author:
Putu Ayu Swandewi Astuti, PhD
Email: ayu.swandewi@unud.ac.id
Tel: +62 361 22510

INTRODUCTION

Globally, cigarette smoking is a major contributors to health and socio-economic loss. In 2018, more than 6 million deaths worlwide was due to tobacco use, while around 1 million of them due to secondhand smoke exposures (1). Indonesia has one of the highest smoking population in the world with around 61,4 million adult smokers. Smoking is particularly high among male, two third of the adult male in Indonesia (2) and one third of the boys aged 13-15 years are smoking (3). While smoking prevalence among the adult population is relatively constant, the smoking rate among young people aged 10-18 years is rising significantly from 7.2% in 2013 to 9.1% in 2018 (4, 5). The increasing smoking rate among young people will lead to socio-economic burden due to chronic disease, loss of productivity and low human resources capacity (6).

Besides the high smoking rate, there is an increasing trend of the use of electronic cigarettes. Electronic cigarette use among adult population was increased by tenfold from 0.3% in 2011 to 3.0% in 2021 (7,8). Among young people aged 10-18, the use of electronic cigarette was even higher at 10.9% in 2018 (5). These figures imply a potency of double burden to Indonesia from the use of these two variances of product, the conventional and electronic cigarettes. Bali Province is one of the provinces in Indonesia with electronic cigarette use as high as 4.2% which is above the national average of 2.8%.(5) A study in Denpasar, Bali in 2015 found one in five high school students have tried electronic cigarettes (9).

Electronic cigarette is an electronic nicotine delivery

system (ENDS) or more commonly known as vape is a relatively new product compared to the conventional cigarettes. ENDS is a nicotine delivery device powered by a battery and produces an aerosol (vapor). The nicotine is delivered in the form of liquid which consists of several additional substances including propylene glycol, glycerin, water, and flavoring agents, which can be varied and attractive because of different flavoring. Nicotine has been well known as an addictive substance that can trigger the central nervous system, elevate heart rates, and blood pressure. Besides there is evidence that nicotine has negative effect on reproductive health, reduce baby's weight and brain growth. Studies also showed that the use of electronic cigarettes can become a gateway to use of conventional cigarettes and other tobacco products among young people. While some may argue it can be use as smoking cessation support, but there are reports of dual use of this product after they try to use it for quitting (10-12).

Supporting smokers to quit is one of the recommended measures by World Health Organization (WHO) to control tobacco use and its impact (13). WHO recommend countries to promote smoking cessation supports to assist smokers to get out of their addiction (11). By quitting smoking, smokers will gain health benefit including reduce risk of disease and also economic benefit from the money that was spent on cigarettes (14-16). Smoking cessation program in Indonesia is far from adequate, however, the government has recommended establishment of smoking cessation services in primary health care services (17).

Studies showed there is low utilization of smoking cessation services (18), some partly due to smokers' internal motivation to quit (15), and encouragement from healthcare providers (18, 19). Health professionals has an essential role to identify risk and provide advice regarding smoking, they also have opportunities to be in contact with smokers or their family members to provide initial assessment and supports (18). Given that opportunity, studies showed that only few of the smokers have ever received advice from their family healthcare professionals (17, 18).

Health professionals in this case doctors and dentists are usually also viewed as role models by their patients regarding health practices. Smoking behaviors among doctors or dentists may influence their intention to provide advice about smoking (20) With the growing trend of electronic cigarette which may perceived as having lower risk of disease, patients are likely to consult their doctors for advice (21, 22). Advice from the doctors will depend on the perception and attitude of the doctors toward electronic cigarettes (20). A Polish study showed 50.2% doctors have moderate knowledge on electronic cigarette and 11.5% of them agree that it can be used for quitting (23). While smoking cessation intervention is more often offered for patients who are smoking conventional cigarettes than those using electronic cigarettes (20).

To date, there is limited study looking at health professional perception and attitude toward electronic cigarettes. Information about these matters is essential since health professionals are important agents to support quitting smoking rationally and effectively. The information regarding health professional belief and attitude around electronic cigarettes will enable us to view the readiness of health professionals to support quitting and whether there is misperception that needs intervention. Based on the above's rational, this study aims to explore primary health professionals smoking behavior and their belief and attitude toward electronic cigarettes.

MATERIALS AND METHODS

This was a cross-sectional study conducted in Bali, Indonesia between October, and November 2021. A 185 sample of general practitioners (GP) and dentist working at primary health care selected through consecutive and snowballing sampling participated in this study. The inclusion criteria were GP and dentist working at primary health care services including government owned, private owned and independent practices who consent to participate in the study. Participants were recruited using various strategies, invitation posted on social media, and through professional associations (convenience sampling) and participants forwarded the study invitation to their colleagues (snowballing sampling).

Variables collected during the study were sociodemographic and clinical practice characteristics including age, gender, profession, length of professional works, smoking status (current, ex-smoker and never smoker), reason for smoking, history and intention to quit smoking for those who ever smoked, their belief and attitude toward electronic cigarettes, and source of information on electronic cigarettes. The questionnaire on belief and attitude was developed by the researchers. We have favorable and unfavorable items which was based on the public health perspective. The favorable items were statements with positive public health perspective e.g. electronic cigarettes have negative consequences on health and it is not a suitable smoking cessation aids, while the unfavorable items include statements that portray the e-cigarette benefits and negative for public health e.g. electronic cigarette will be recommended for smoking cessation. We tested for validity and reliability and found the item validity coefficient (r) of most items were >0.7 and few items are >0.5 which show good degree of validity. It was also reliable with Cronbach's Alpha of 0.7 for attitude variable and 0.9 for the belief variable.

Data was collected through a self–administered online

questionnaire with Kobotoolbox, which was designed to be completed within 15 – 20 minutes. Participants were provided with the general information of the study and information regarding ethical considerations including voluntary participation, confidentiality of their response and anonymous data and data analysis only for the need of the study. Participants gave online consent before they were filling out the survey. A mobile phone credit voucher or e-money valued at IDR 50.000 (US$ 3.5) was given to each of the respondents who completed the survey and agreed to be compensated.

Data was then analyzed descriptively using STATA v.12 including distribution of sociodemographic and clinical practices characteristics, smoking related behaviors, belief, and attitude toward electronic cigarettes. For belief and attitude, we categorized into two categories: good if total score equal and more than 75% of potential total score. Then, we explored the attitude of healthcare providers toward electronic cigarette based on sociodemographic characteristics, clinical practice and source of information.

This study has received an ethical clearance from the Ethical Committee of Faculty of Medicine, Universitas Udayana and Sanglah Hospital with reference letter No. 1997/UN14.2.2.VII.14/LT/2021

RESULTS

The average age of the primary health care providers involved in the study was 37.65 years, 61.6% of them were female with median length of professional works of 10 years. The type of health care providers was around 40% for government and independent practice (Table I). Of the 185 GP and dentists, only 3 (1.62%) were current smokers and 6(3.24%) were ex-smokers. Among these 9 who currently and ever smoked, the average age of smoking initiation was 20 years, with the two top reasons was curious to try and to reduce stress, as high as 44.4%, respectively. The majority (77.78%) of them were a daily smoker who smoke 1-10 cigarettes per day (88.90%) and half of them took their first cigarette more than 60 minutes after waking up in the morning (55.56%). Regarding places that they were usually smoke, the majority reported outside their house (77.78%) and at public places (33.33%), while they denied to ever smoke at other venues considered as smoke free venues (Table II).

Based on total score of response, around three quarter (72.43%) have good belief on electronic cigarettes. More than 80% of the respondents viewed electronic cigarette have negative impacts on health and caused addiction and the aerosol are dangerous to others, however, some of them have a neutral view. Similarly, most of the respondents agreed that electronic cigarette is carcinogenic and increase risk of cardiovascular and lung disease, but around 16.8% have neutral view about this. While the majority stated disagree that electronic cigarettes are less dangerous and have lower risk of cardiovascular and chronic lung disease than conventional cigarettes, but 11.9% of them agree that electronic cigarettes are less dangerous and 17.3% agree that it has lower risk of cardiovascular and lung disease (Figure 1) .

Table I: Socio-Demographic and clinical practice of primary health-care providers

Characteristics (N=185)	f	%
Age (mean, SD)	37.65 (7.66)	
Min- Max	25-58	
Sex		
Male	71	38.38
Female	114	61.62
Profession		
Dentist	75	40.54
General Practitioner	110	59.46
Place of		
Government health facilities	74	40.00
Independent practice	73	39.46
Private health facilities	38	20.54
Length of professional work in years (median, IQR)	10 (12)	
Min- Max	1 - 35	

Regarding doctors and dentist attitude toward use of electronic cigarettes and smoking, the majority (83.24%) have good attitude toward electronic cigarette. Most health professionals should become role models for not smoking and healthcare practices should be 100% smoke free. Most of the respondents perceived electronic cigarettes as gateway to smoking conventional cigarettes, but around a quarter of them (26.5%) disagree and neutral. While most of them did not agree electronic cigarette as smoking cessation and replacement for smoking, around 13.4% agree it can be used as smoking cessation and 9.2% agree that it should be recommended as a substitute for smoking (Figure 1). The health professionals have several sources of information regarding electronic cigarettes. The most common was news in mass media (56.8%), review on social media (52.4%) and article/academic papers (48.1%), whilst more than a quarter got the information from patients (26.5%).

Further analysis for the attitude showed healthcare providers that are older (>40 years), female and have longer time of practices were more likely to have good attitude toward electronic cigarettes, although it was not differ statistically. Health providers who were never smoking were four time more likely to have good attitude compare to those who were ever smoking (OR=4.41, 95% CI=1.11-17.49, p=0.035), while those with good belief on electronic cigarettes were ten time more likely to have good attitude (OR=10.54, 95% CI. 4.39-25.56, p<0.001). For the source of information, scientific

Table II: Smoking behaviors among primary healthcare providers

Smoking behaviors (n= 185)	f	%
Smoking status		
Current smoker	3	1.62
Ex-smoker	6	3.24
Never smoker	176	95.14
Current and Ex-smokers only (n=9)		
Age of smoking initiation		
(Mean, SD)	20 (2.89)	
Min Max	17-26	
Smoking frequency (n=9)		
Every day	2	77.78
Several times a week	0	
Occasionally	7	22.22
Time to smoke after waking up in the morning		
<= 5 minutes	0	0.00
6-30 minutes	2	22.22
31-60 minutes	2	22.22
>60 minutes	5	55.56
Average of cigarette consumed per day		
1-10 sticks	8	88.90
11-20 sticks	1	11.10
Reason for the first smoking initiation*		
Offer from a friend	2	22.20
Parent/adult smoking	1	11.10
Curious to try	4	44.40
Reduce stress	4	44.40
Improve moods	4	22.20
Place usually/ever smoking (n=9) *		
Inside the house	1	11.11
Outside the house	7	77.78
At public place	3	33.33
Current smokers only (n= 3)		
Number of cigarettes consumed during compares to before COVID-19 pandemic		
The same amount	1	33.33
Reduced	2	66.67
Intention to quit smoking	3	100
Intention to quit smoking due to pandemic	3	100
Ever tried to quit smoking	3	100
Reasons of relapse		
Stress	2	66.67
Seeing others smoking	1	33.33
Reason of quitting (ex-smoker, n=6) *		
Harmful to health	4	66.67
Others	3	33.33
Use of alternative tobacco products/nicotine delivery system (ecig/vape, juul, sisha, iqos, snuz) (n = 18)	1	0.54

*) more than one answer

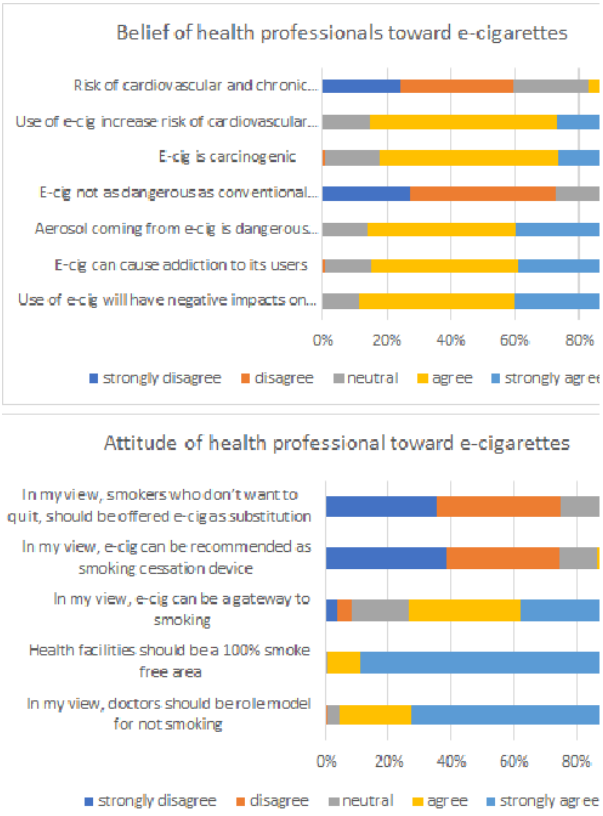

Figure 1: Responses of health professional to belief and attitude questions

publication (OR=3.9, 95% 1.59-9.60; p=0.003) and from patients (OR=4, 95% CI 1.15-13.7; p=0.03) were the source that is associated with good attitude toward electronic cigarettes (Table III).

DISCUSSION

Health professionals play essential roles in assessing and supporting smokers to quit smoking; hence, they must have an adequate understanding on smoking cessation and proper methods to support patients to quit. With the growing use and availability of electronic cigarettes, and varied perception on this product, health professionals should be able to provide appropriate advice. In this study, we found the majority of the GPs and dentists have positive beliefs and attitude that electronic cigarettes are harmful and not a proper cessation device, however, some of these health professionals had the opposite views.

The harmful impacts of smoking on human health have been well established, due to the high numbers of chemical substances and carcinogens contained in a cigarette and produced during the burning process (24). As for electronic cigarettes, which was available several decades after conventional cigarettes, the reported

Table III: Attitude toward e-cigarette based on characteristics, belief and source of information

Characteristics	Attitude		OR	95%CI	p
	Good n(%)	Poor n(%)			
Age					
≤40years	95(80.5)	23(19.5)	Ref		
>40years 0.035	59(88.1)	8(11.9)	1.79	0.75–4.25	0.19
Gender					
Male	56(78.9)	15(21.1)	Ref		
Female	98(85.9)	16(14.1)	1.64	0.75–3.57	0.21
Profession					
Dentist	63(84.0)	12(16.0)	Ref		
GP	91(82.7)	19(17.3)	0.91	0.41–2.01	0.82
Length of practice					
≤10 years	77(78.6)	21(21.4)	Ref		
>10 years	77(88.5)	10(11.5)	2.1	0.93–4.80	0.075
Smokin gstatus					
Current smoking	1(33.3)	2(66.7)	Ref		
Not smoking	153(84.1)	29(15.9)	10.55	0.93–120.22	0.06
Smoking history					
Ever smoking	5(55.6)	4(44.4)	Ref		
Never smoking	149(84.7)	27(15.3)	4.41	1.11–17.49	0.035*
Belief					
Poor	29(56.9)	22(43.1)	Ref		
Good	125(93.3)	9(6.7)	10.54	4.39–25.26	<0.001*
Information on e-cig from other doctors					
No	111(81.6)	25(18.4)	Ref		
Yes	43(87.8)	6(12.2)	1.61	0.62–4.21	0.33
Information on e-cig from news in mass media					
No	65(81.3)	15(18.7)	Ref		
Yes	89(84.8)	16(15.2)	1.28	0.59–2.78	0.53
Information on e-cig from reviews in social media					
No	73(82.9)	15(17.1)	Ref		
Yes	81(83.2)	16(16.5)	1.04	0.48-2.25	0.92
Information on e-cig from advertisement in mass media					
No	135(85.4)	23(14.6)	Ref		
Yes	19(70.4)	8(29.6)	0.40	0.16–1.03	0.06
Information on e-cig from scientific publication					
No	72(75.0)	24(25.0)	Ref		
Yes	82(92.1)	7(7.9)	3.90	1.59–9.60	0.003*
Information on e-cig from patients					
No	108(79.4)	28(20.6)	Ref		
Yes	46(93.9)	3(6.1)	4.00	1.15–13.7	0.03*
Information on e-cig from family					
No	121(82.9)	25(17.1)	Ref		
Yes	33(84.6)	6(15.4)	1.14	0.43–2.99	0.80

health outcomes may be less but we may not be able to compare it with adequate balance with cigarettes due to this time differences. However, there is growing evidence on the negative impacts of electronic cigarettes, a systematic reviews showed that electronic cigarettes cannot be considered as harmless; it contains harmful metals, carcinogenic tobacco-specific nitrosamines, volatile organic compounds, carcinogenic carbonyls (25). Besides, electronic cigarettes also pose several risks to bystanders who inhale the aerosol produced from the device (26). Therefore, the harm reduction arguments for those supporting use of electronic cigarettes as device to support smoking cessation can be argued as problematic, since it may introduce other potential harms to smokers.

Around 13.4% of health professionals in our study agreed that electronic cigarettes can be used as smoking cessation and 9.2% agreed that it should be recommended as a substitute for smoking. This fact showed that not all health professionals have adequate understanding and probably access to proper information and evidence around this relatively new product with evolving evidence on its health consequences (27). Moreover, attitude toward electronic cigarette is associated with smoking history of the health professionals although the confidence level relatively low due to small sample size. Therefore, it is important for the health professional's organization in collaboration with academics and public health experts to conduct regular updates on this matter since health professionals are potential resource persons for their patients who seek advice. Based on the frequently accessed source of information accessed by these health professionals including news in mass media, review on social media and academic papers, these avenues can become appropriate channels to convey progressing evidence around the health impacts of electronic cigarettes.

It is also necessary for the government to regulate this product. Over 30 countries in the world have banned the use of electronic cigarettes, some regulated it differently. WHO recommended governments to take necessary action including to prevent promotion of electronic cigarettes and its uptake especially by non-smokers, youth and pregnant women, minimize potential health risks to users and non-users, prohibit unproven health claims about electronic cigarettes and protect tobacco control efforts from the tobacco industry interest (28).

Currently, tobacco control regulation in Indonesia, the Government Regulation No 109/2012 do not provide explicit provision around electronic cigarettes. The regulation itself is considered inadequate to control and reduce smoking rate in Indonesia (29) and to protect young people from exposure to cigarette advertising (30). The Indonesian government must urgently strengthen this regulation to provide adequate measures as recommended by WHO on the "MPOWER" strategies. It is also important for the governments to address barriers to strengthening tobacco control measures in Indonesia (31) by adopting several strategies such as strengthening sub-national tobacco control efforts and addressing tobacco industry interference on policy making and implementation (32).

In this study, the proportion of health professionals who were smoking was small, 1.6% for current smokers and all of them have tried to quit for health reasons but fail because of stress and environmental triggers. National health research data also showed around 60% of smokers have intention to quit smoking (2) which signify the urgency to improve smoking cessation supports at both government and private health facilities. The ABC cessation approaches stand for "Ask", "Brief Advise" and Cessation supports" is potential to be adopted and integrated to existing programs (33).

In this study, the sample size was relatively small and those who were ever smoking is small. Although we have tried to used combined recruitment, there is potency of selection bias hence generalization should be made with caution. Nevertheless, the respondents include those who work less and more than 10 years. Future study should consider bigger sample and adequate proportion of health professionals who are smoking in the sample. There is also possibility of social desirability bias due to self-report, but it has been tried to minimize with anonymous responses.

CONCLUSION

Primary health care professionals view electronic cigarettes as a potential risk for health but some of them have neutral and less positive attitude. Some of the health professionals also agree that electronic cigarettes can be used as smoking cessation devices and agree to recommend it use for substituting cigarette smoking. Based on this finding, it is necessary to provide adequate information based on the growing evidence of negative impacts of electronic cigarettes through several channels frequently accessed by health professionals. Improving smoking cessation services and other tobacco control measures are also necessary to prevent double burden from cigarettes and electronic cigarettes.

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