



**University of
Nottingham**

UK | CHINA | MALAYSIA

**A MIXED METHODS INVESTIGATION INTO
ATTITUDES, BEHAVIOURS, AND HEALTH
RISK PERCEPTIONS OF INDONESIAN
PEOPLE REGARDING THE USE OF KRETEK
CIGARETTES**

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**Thesis submitted to the University of
Nottingham for the degree of Doctor of
Philosophy**

2020

ABSTRACT

Background

Smoking is very common in Indonesia: among adults, around 66% of males and 7% of females are smokers. Smoking is not only harmful for people who smoke but also for people who are exposed to second-hand smoke on a regular basis. An estimated 90 million Indonesian people involuntarily inhale cigarette smoke every day. Every hour 46 Indonesians die due to smoking-related diseases. Globally, most smokers consume regular factory-made cigarettes, but in Indonesia, kretek (cigarettes with cloves and other additives) is the most popular tobacco product, smoked by around 90% of Indonesian smokers (54.2 million people). To date, no systematic review has investigated the health effects of kretek cigarettes. Research exploring Indonesian smokers and kretek has focused on the social and cultural aspects of smoking behaviour in Indonesia, and most of this is out of date. No research was found that specifically investigated the attitudes, knowledge, and health risk perceptions of the Indonesian population regarding kretek use. Health professionals (HPs) can play a key role in providing smokers with support to stop smoking, however, in Indonesia many HPs are reported to be smokers themselves. Data are needed to understand the smoking behaviours and attitudes of Indonesian HPs and their perceived role in helping smokers to stop.

This research project seeks to: (i) evaluate and summarize the findings of all relevant individual studies investigating the health effects of kretek; (ii) investigate Indonesian smokers' and non-smokers' perceptions concerning the health risks of kretek cigarettes compared to regular cigarettes, and to gain a better understanding of the role of kretek cigarettes in the lives of Indonesian people; and (iii) to understand smoking-related attitudes and practices of HPs in Indonesia.

Methods

This research project has been conducted using three different approaches. (1) A systematic review of the health risks of kretek cigarettes. (2) A qualitative

study with a total of 58 participants (smokers and non-smokers). All interviews were a semi-structured one-to-one telephone interview. The interviews with smokers covered the use of kretek and regular cigarettes, attitudes and beliefs about them, the perceptions of risks and benefits of kretek cigarettes compared to regular cigarettes, as well as the smokers' attempts to quit. Interviews with non-smokers included concerns about the use of kretek cigarettes by family members or friends and perceptions of the health risks or benefits associated with passive exposure to kretek smoke. (3) A quantitative study about Indonesian the perceptions of health professionals (physicians and dentists) of the health risks or benefits of smoking and their perceived role in helping smokers to stop. Participants (Indonesian HPs) were asked a total of 20 questions in the survey. General demographic items covered age, gender, workplace location, occupation (physician or dentist), work location, and smoking status. Health risk perceptions were assessed using questionnaires adapted from the World Health Organization Health Professionals' Tobacco Survey 2004.

Results

Systematic review

This systematic review identified a relatively limited number of studies (n=32), mainly cross-sectional studies of poor quality. After considering the strengths and limitations of the systematic review, the evidence showed that kretek have similar health risks to regular cigarettes. Included studies suggested that kretek increases the risks of oral cancer, coronary heart disease, asthma, and nicotinic stomatitis. One study shows significant association between passive kretek exposure and gingival melanin pigmentation.

Qualitative study

The results of qualitative study of 58 people showed gender differences in attitudes as well as behaviour, but a generally poor understanding of the health risks of smoking. Whilst kretek are favoured by older smokers, things are changing, and younger smokers seem to increasingly prefer regular and manufactured kretek cigarettes. There are misconceptions about the relative health effects of different types of cigarettes, and attitudes that seem to be

influenced by tobacco advertisements, in a country where big tobacco has a major lobbying presence.

Quantitative study

The study found that one in five health professionals smoke, and this is much higher in men. The majority understand the risks of doing so but continue to smoke. This study highlighted the strong cultural values associated with smoking in Indonesian society that are challenging to overcome. Health professionals were largely supportive of comprehensive measures and policies such as smoke-free policies that would help to change the culture. The study also highlighted that most health professionals understood the need to ask, advise, and support their patients to stop smoking, but they lacked the training and the facilities and services to provide the types of support which have been shown to be most effective in other societies.

Conclusions

Smoking is very common in Indonesia, and the majority of Indonesian smokers use kretek. The systematic review study shows that existing evidence is insufficient to assess the health risks of kretek in detail, however, considering the strengths and limitations of the study, kretek are likely to be at least as harmful as regular cigarettes and that policy makers need to implement measures to avoid this harm. Qualitative study shows that smoking is dominated by males and seen as part of their culture; non-smokers and women are generally aware of the health risks of smoking and second-hand smoke, but lacked detail knowledge of the health risks and benefits to stopping smoking. There is little support to help people to quit.

Smoking is still common among HPs who understand the risks. Indonesian HPs lack confidence to assist patients to quit. This highlights the need for specific training for HPs to understand smoking cessation and to better advise and support their patients to quit.

Indonesia is the only Southeast Asia country that has not ratified FCTC. The situation is worsened by the strong influence of the tobacco industry in the economy and in politics. Indonesia has minimal smoke-free policy, cessation

programs, health warnings, and advertising bans, and cigarettes remain relatively affordable. Indonesia needs a comprehensive tobacco policy, and it must enforce that policy, compliant with the MPOWER measures proposed by the WHO.

PUBLICATIONS ARISING FROM THIS THESIS

1. Desy Nuryunarsih, Sarah Lewis, Tessa Langley. Health risks of kretek cigarettes: A systematic review (accepted subject to minor revisions, Nicotine & Tobacco research - Oxford academic journal).
2. Desy Nuryunarsih, Sarah Lewis, Tessa Langley. Health risks perceptions of Indonesian Health Professionals regarding the use of kretek (under review)

Presentations

5th International Conference on Public Health ICOPH 2019 "Promoting Global Health Equity towards a Sustainable Future" 10th – 12th July 2019 Kuala Lumpur, Malaysia

Oral presentation: Attitudes, Knowledge and Health Risk Perceptions of Indonesian People regarding the Use of Kretek Cigarettes (Qualitative Study)

Sue Watson Post graduate Research Presentation, University of Nottingham, 26 October 2018

Oral presentation: Attitudes, Knowledge and Health Risk Perceptions of Indonesian People regarding the Use of Kretek Cigarettes (Qualitative Study)

ACKNOWLEDGEMENTS

To my supervisors Professor Sarah Lewis and Dr Tessa Langley, thank you for being my inspiration. I am grateful not only for your guidance and expertise but also for your support and patience. Without your knowledge and encouragement, I would have faltered.

My sincere thanks to my friends for their academic and non-academic support and for always accompany me to the library.

Thank you to those special people in my life; my son Mahija Zaidan and Mika Makareem, you have been a constant source of comfort and motivation. My sister Yuni Antini for her love and wise counsel and special thanks to my very best friend Joko Harsoyo, who always gives me encouragement and support throughout this venture. This thesis would not have been possible without him.

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LIST OF ABBREVIATIONS

| | |
|--------|---|
| ASEAN | Association of Southeast Asian Nations |
| ASH UK | Action on Smoking and Health United Kingdom |
| ASH US | Action on Smoking and Health United States |
| BAT | British American Tobacco |
| BOS | Bristol Online Survey |
| BPJS | Badan Penyelenggara Jaminan Social (Social Insurance Administration Organization) |
| CDC | Centers for Disease Control and Prevention |
| CI | Confidence Interval |
| COPD | Chronic obstructive pulmonary disease |
| CVD | Cardiovascular diseases |
| DALYs | Disability Adjusted Life Years |
| FCTC | Framework Convention on tobacco control |
| FEF | Forced expiratory flow |
| FEV1 | Forced expiratory volume in 1 second |
| FVC | Forced vital capacity |
| GDP | Gross Domestic Product |
| GNI | Gross National income |
| HDI | Human Development Index |

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|-------|---|
| HPs | Health professionals |
| IDI | Ikatan Dokter Indonesia (Indonesian Medical Association) |
| JKN | Jaminan Kesehatan Nasional (National Health Insurance) |
| JTI | Japan Tobacco International |
| LMICS | Low-and-middle-income countries |
| MI | Myocardial infarction |
| MUI | Majlis Ulama Indonesia (Indonesian Council on Religion) |
| NCD | Non-communicable disease |
| NIH | National Institute of Health |
| NIHRD | National Institute of Health Research Development |
| NOS | Newcastle Ottawa scale |
| NRT | Nicotine replacement therapy |
| OOPs | Out-of-pocket payment |
| OR | Odds ratio |
| PDGI | Perhimpunan Dokter gigi Indonesia (Unity Dentist Indonesia) |
| PECOS | Population-Exposure-Comparison-Outcomes-Study design |
| PMI | Philip Morris International |
| PRHOs | Pre-registration house officers |
| RR | Related risk |
| SHS | Second-hand smoke |

| | |
|-------|---|
| SEARO | South-East Asia Regional Office |
| SKM | Sigaret kretek mesin (kretek rolled by machine) |
| TAPS | Tobacco advertising, promotion and sponsorship |
| UK | United Kingdom |
| UN | United Nations |
| US | United States |
| URL | Universal Resource Location |
| WHO | World Health Organization |

CHAPTER 1

BACKGROUND AND EPIDEMIOLOGY OF SMOKING IN INDONESIA

1.1. Introduction

The global smoking epidemic is a worldwide threat to people's health, causing 8 million deaths annually (1). More than seven million of those deaths are caused by direct inhalation of tobacco smoke from cigarettes, while 1.2 million deaths are among passive smokers or people who involuntarily inhale cigarette smoke (1). Tobacco use is a major risk factor for non-communicable disease (NCD), especially cancer, lung disease, and cardiovascular diseases (CVD), which kill 5 million people per year (2).

There are many forms of tobacco product on the market. Regular cigarettes are the most commonly used by smokers, however other tobacco products such as kretek, shisha, and bidis, are gaining popularity, and people often think that such products are less dangerous than regular cigarettes (3). In Indonesia, kretek are the most popular cigarette product, used by 90 percent of Indonesian smokers, comprising around 54.3 million people (4). Despite the high number of kretek cigarette smokers in Indonesia, little is known about their particular health risks and people's attitudes toward such products. This thesis therefore reviews the evidence on the health effects of kretek cigarettes and investigates Indonesian people's attitudes, behaviours, and health risk perceptions about the use of kretek and other tobacco products.

This chapter, summarizes the key literature on the health risks of cigarettes smoking, describes the profile of Indonesia, reviews the state of the tobacco epidemic in Indonesia and Indonesian neighbour countries, and describes tobacco control policies and the role of tobacco use in Indonesian people's lives.

1.2. The health effects of tobacco

1.2.1. Direct effect of tobacco use on health

Cigarette smoke contains thousands of chemicals, some of which are substances that can damage the lungs (5). The smoke not only contains solid pieces of tar, but also gases, including carbon monoxide and nitrogen oxides. Smoking takes this poisonous substance into the lung, where it is possibly trapped in the lung tissue (6). Smoking was not widely considered as a cause of lung disease until a case control study of lung disease initiated by Doll and Hill (6, 7). The most well-known lung disease is lung cancer, but smokers also have a greatly increased risk of chronic obstructive pulmonary disease (COPD) (6). Smoking can cause many fatal diseases, such as coronary artery disease (ischemic heart disease or 'heart attacks', COPD, lung cancer, and other cancers, especially of the mouth, throat, bladder, kidneys, pancreas, oesophagus (gullet), stomach, liver, and myeloid and monocytic leukaemia, cerebrovascular lesions, and aortic aneurysm (ballooning in the aorta, the main artery) (8).

Smoking can also cause other diseases, such as increased risk (largely or entirely caused by smoking) of peripheral vascular disease, increased risk (partly caused by smoking) of conditions such as cataracts, Crohn's disease, gastric ulcer, duodenal ulcer, hip fracture, and periodontitis (8-10).

Tobacco already kills 1 in 10 adults around the world. By 2030, if the pattern of smoking all over the globe does not change, it is estimated it will kill 1 in 6, or more than 10 million deaths a year. At least 7 in 10 of these deaths will be in low-income or middle-income countries (5).

1.2.1.1. Chronic obstructive pulmonary disease (COPD)

COPD is lung damage associated with air-flow obstruction, also known as chronic bronchitis and emphysema. COPD mainly occurs in smokers; COPD and smoking have a strong association, similar to lung cancer and smoking. Smokers with COPD are 12-13 times more likely to die compared to non-smokers (6).

1.2.1.2. Smoking and cardiovascular (heart and blood vessel) disease

Cigarettes contain chemical products that can damage the lining of the coronary arteries; this leads to atherosclerosis – hardening of the artery walls – and makes blood clots more common (8). The chemical content of cigarettes can also increase the blood cholesterol; high cholesterol is part of the cause of coronary artery disease (ischemic heart disease, heart attack) and stroke (8).

1.2.1.3. Coronary (or ischemic) heart disease and stroke

Coronary heart disease is one of the commonest causes of death in many industrialised countries (11). There are many causes of heart disease, including high blood pressure, raised blood cholesterol, diet, obesity, lack of exercise, diabetes, and family history, but the most important and preventable cause is tobacco use (12).

1.2.1.4. Smoking and cancer

Smoking is the biggest cause of cancer worldwide. It increases the risks of lung cancer, bladder cancer, cervical cancer, cancer of the larynx, pharynx, mouth, oesophagus, pancreas, stomach, and many more. Smokers are seven times more likely to die of cancer than non-smokers (13). Even light or irregular smoking can increase the risk of cancer. Smoking contributes to 20 percent of deaths caused by cancer and 70 percent of deaths caused by lung cancer (14). Around 50% of current smokers will be killed by their behaviour if they continue to smoke, and a quarter to half of them will die in middle age (15). Cancer cases annually rise from 14 million in 2012 (16).

1.2.2. Passive smoke exposure and smoking-related diseases.

Passive smokers inhale smoke breathed in and out by smokers, and breath some from burning tips of cigarettes. Environmental tobacco smoke causes a similar range of diseases to active smoking including cancers, heart disease, stroke and respiratory disease (17, 18).

Passive smoking is associated with an increased risk of chronic respiratory disease in adults and children (19). Passive smoking also increases the risk of lung cancer and ischemic heart disease (20). Maternal smoking doubles the

risk of sudden infant death syndrome (21). Children with mothers or fathers who smoke also have an increased risk of respiratory problems and middle ear disease (22).

1.3. Prevalence of smoking

1.3.1. Prevalence of smoking worldwide

There are an estimated 1.337 billion tobacco users worldwide (1.1 billion smokers and 337 smokeless tobacco users), comprising almost 20% of the world population (23) Globally, 21% of adults are current smokers (men 36%; women 6%) (27). WHO estimates of smoking worldwide in 2015 are shown in

Table 1-1.

Table 1-1 Prevalence of smoking worldwide

| WHO Region | Male prevalence | Female prevalence | Both sexes |
|-----------------------|-----------------|-------------------|------------|
| Europe | 38 % | 19 % | 28 % |
| Western Pacific | 48 % | 3 % | 26 % |
| Eastern Mediterranean | 37 % | 3 % | 20 % |
| America | 22 % | 13 % | 17 % |
| South-East Asia | 32 % | 2 % | 17 % |
| Africa | 25 % | 2 % | 13 % |
| Global | 36 % | 6 % | 21 % |

Source: WHO regional office Europe 2020 (28), WHO report on tobacco epidemic 2015 (29).

1.3.2. Prevalence of smoking in low- and middle-income countries

Around 80% of tobacco users live in low- and middle-income countries (LMICS) (24). Cigarette smoking has gradually decreased in developed countries, thus multinational tobacco companies have intensified their marketing efforts in the developing world, where there are already high rates of smokers and weak tobacco control policies (25, 26). Cigarette smoking is predicted to continue increasing in developing countries (27). Approximately 70% of deaths from cancer occur in low- and middle-income countries (13).

1.3.3. Prevalence in ASEAN countries

Indonesia and its nine Association of Southeast Asian Nations (ASEAN) neighbours have similarities in culture, economics, and geopolitics. Around 10% or 122.4 million of the world's smokers live in ASEAN countries, which account for 20% of global deaths caused by smoking-related diseases. Half of all ASEAN smokers live in Indonesia (62 million) (1, 28). Indonesia is the most populous country in ASEAN and has the highest smoking prevalence, particularly among males. WHO estimates of smoking rates in ASEAN countries in 2012 and 2016 are shown in Table 1-2.

Table 1-2 Male and female smoking prevalence in ASEAN countries, 2012-2016

| No | Country | 2012 prevalence (%) | | 2016 Prevalence (%) | | 2012 Population | 2016 Population |
|----|-------------|---------------------|--------|---------------------|--------|-----------------|-----------------|
| | | Male | Female | Male | Female | | |
| 1 | Indonesia | 65.7 | 4.2 | 66.0 | 6.7 | 237,641,326 | 260.581.100 |
| 2 | Philippines | 44.8 | 7.8 | 31.1 | 5.8 | 92,000,000 | 102.250.133 |
| 3 | Vietnam | 47.4 | 1.4 | 37.5 | 1.1 | 86.024,000 | 94.444.200 |
| 4 | Thailand | 46.6 | 2.6 | 32.6 | 1.8 | 67,312,000 | 68.146.609 |
| 5 | Myanmar | 44.8 | 7.8 | 27.4 | 8.4 | 59,130,000 | 54.363.426 |
| 6 | Malaysia | 43.9 | 1.0 | 33.9 | 1.4 | 28,250,500 | 30.751.602 |
| 7 | Cambodia | 31.8 | 2.9 | 29.5 | 2.4 | 13,388,910 | 15.827.241 |
| 8 | Laos | 65.9 | 4.2 | 43.8 | 7.1 | 6,000,000 | 6.918.367 |
| 9 | Brunei | 31.8 | 2.9 | 24.7 | 2.3 | 406,000 | 428.874 |
| 10 | Singapore | 24.7 | 4.2 | 23.3 | 3.8 | 5,076,700 | 5.696.506 |

Source: WHO Global Report on Trends in Prevalence of Tobacco Smoking 2000-2025 (35); Population Pyramid of the World from 1950 to 2100 (36).

As seen above, the prevalence of smokers in ASEAN countries varies greatly, with the lowest prevalence of male smokers in Singapore, and the highest in Indonesia, with almost three times the percentage of Singapore (29).

1.4. Trends in cigarette smoking in ASEAN countries

Indonesia has the highest number of smokers with 62 million, while Brunei has the least with 72,000 people (30). Contrary to other neighbouring countries, the number of smokers in Indonesia is estimated to be increasing annually, and the average age of starting to smoke is reducing, usually under 18 years old and also commonly among the younger, productive generation (aged 15-29 years) (28). Although the prevalence of smokers in most ASEAN countries has decreased, statistics reveal an increase in smoking prevalence amongst younger people (30).

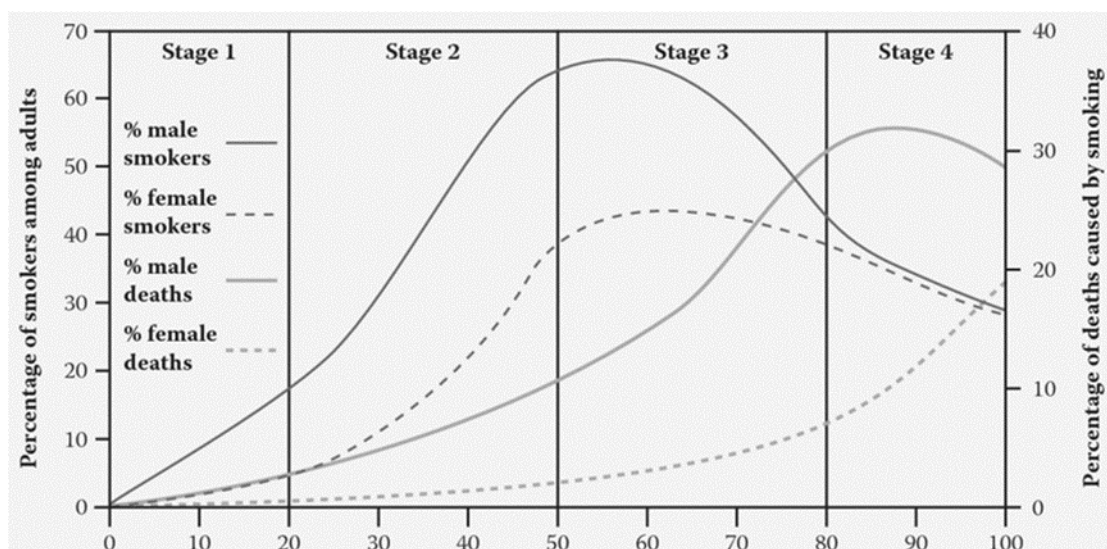
All ASEAN countries have decreased their smoking prevalence in recent years except for Indonesia, where there was an increase in both male and female smokers, from 65.7% to 66% and 4.2% to 6.7% (respectively) from 2012 to 2016 (35).

In 2010 the percentage of young smokers aged 13-15 years old globally increased from 16% to 21%, while in Southeast Asia the prevalence of young smokers increased from 16% to 18% from 2007 to 2010 (30). Indonesia, Myanmar, and Thailand have the highest rates of young smokers (aged 13-15 years), with 35.2%, 30%, and 26.9% smoking prevalence among this age group, respectively (27).

1.4.1. Epidemic models and where the ASEAN countries lie

Lopez et al. (1994) described the stages of the smoking epidemic as it develops in virtually every country, to discover connections with disease burden caused by smoking cigarettes within and across countries. This model (Figure 1-1) can also be used to see the natural evolution in relation to tobacco marketing, and dependence on manufactured cigarettes (31).

Figure 1-1 Four stages of tobacco epidemic



Source: Lopez, Collishaw, and Piha (1994). A descriptive model of the cigarette epidemic in developed countries. *Tobacco Control*, 3(3): 242-247 (39).

According to this model, all ASEAN countries are in the second stage of this epidemic model, with a high percentage of male smokers (over 20% of the net male population), a shift towards smoking initiation at younger ages, and increasing mortality caused by smoking-related diseases (e.g. lung cancer and cardiovascular disease, etc.). However, aside from Indonesia, the other nine countries (Singapore, Brunei, the Philippines, Laos, Myanmar, Thailand, Malaysia, Cambodia, and Vietnam) are shifting their pattern to the third stage, characterized by a decline in the number of both male and female smokers. Smoking-related mortalities account for 10-30% of all deaths, most of which are males (28).

Conversely, Indonesia is stuck in stage two, with a high prevalence of male smokers, slowly increasing prevalence of female smokers, a steady increase of young smokers, an increase in smoking-related illness and mortality, a lack of tobacco control activities, and relatively low public and political support to implement the effective tobacco control policy (32).

1.5. Profile of the study area

This section introduces the study area of this thesis, which is Indonesia. This section describes its geography, economy, population, religion and culture, health services, and education. In addition, this section also describes national tobacco consumption and tobacco control efforts.

1.5.1. Geography

Indonesia is one of the largest archipelagos in the world, with 17,508 islands, 6,000 of which are inhabited (Figure 1-2). It is located in Southeast Asia between the Indian Ocean and the Pacific Ocean, spanning a total area of 1,919,440 km² (land = 1,826,440 km²; water = 93,000 km²). Indonesia is home to 255 million people (33).

Figure 1-2 Map of Indonesia



Source: Indonesian map, Worldometer, 2020 (73).

1.5.2. Population

Based on the 2013 Indonesian population survey, the population of Indonesia is 255 million people, consisting of 128 million male and 127 million female residents. Figures on dependent expenses indicate that in 2013, every 100 productive residents of Indonesia, in addition to supporting themselves, also supported 48-49 unproductive people (34).

1.5.3. Religion and culture

In Indonesia, 87.2% of people identify themselves as Muslims, 9.8% as Christians, 1.7% as Hindus, 0.7% as Buddhists, and 0.05% Confucians. Indonesia is culturally, ethnically, and linguistically diverse, with over 300 ethnicities and 1340 tribes. The largest ethnic group in Indonesia is the Javanese people, who make up 41% of the whole Indonesian population, with substantial ethnic minorities including Malays in Sumatra, and Papuan people in Kalimantan and Papua. The official national language is Indonesian (Bahasa Indonesia), a variety of Malay, but most people are also fluent in another first language from over 700 indigenous local languages, including Javanese, Sundanese, and Acehnese etc. Those local languages are commonly used at home and within local communities, while more formal communication and education is conducted in Indonesian (35).

1.6. International policies to prevent harms from tobacco smoke

1.6.1. Framework Convention on Tobacco Control (FCTC)

The FCTC (Framework Convention on tobacco control) is an international treaty specifically related to public health. The FCTC aims to protect current and future generations from the health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke. Today, the FCTC has been ratified by 181 parties, covering 90% of the global population (36). By signing the FCTC treaty, these parties have firmly committed to curbing the tobacco epidemic (36).

FCTC have several substantive obligations in guiding their parties, especially on limiting demand and supply of cigarettes; demand reduction included, tax

and tobacco sales (article 6), non-price measures to reduce the demand for tobacco (article 7), protection from exposure to tobacco smoke (article 8), regulation on the content of tobacco and product closures (article 9 and 10), packaging and labelling tobacco products (article 11), education, communication and public awareness (article 12), tobacco advertisement, promotion and sponsorships (TAPS) (article 13), each country provides cessation support in their national health program (article 14). Supply reduction, illicit, misbranding trade in cigarette product (article 15), sales to minors (article 16), provision of support for economically viable alternative activities (article 17). There are also several important provisions such as reporting and exchange information, research surveillance, cooperation in the scientific, technical and legal field and provision of related expertise (article 20,21,22) (36-38).

FCTC has been an important measure to reduce the harms of smoking across the world; its effectiveness depends on the extent to which it is introduced and enforced (40). FCTC has successfully supported national, regional and global tobacco control efforts (36). Significant reductions in tobacco use can be reached by implementing MPOWER measures ratified by FCTC (39).

1.6.2. MPOWER

To combat the tobacco epidemic, WHO has introduced six areas of tobacco control, which summarise the central aspects of the FCTC, and act as a guide to FCTC countries in the development and implementation of tobacco control policies: Monitoring the epidemic and prevention policies, protect people from tobacco smoke, offer help to quit tobacco use, warn about the dangers of tobacco, enforce bans on tobacco advertising, promotion and sponsorship and raise taxes on tobacco (40).

1.6.2.1. Monitoring the epidemic and prevention policies

Good national and international monitoring of tobacco use and tobacco control programmes are needed, in order to provide policy makers with information about the extent of the epidemic in a country, and how-to tailor policy based on the situation (36). Monitoring systems should track tobacco use indicators, including cigarette smoking and other forms of smoked tobacco, smokeless

tobacco products, and other tobacco products such as tobacco vaporizers and heated tobacco products, as well as non-tobacco forms of nicotine use. Monitoring also should cover the tobacco industry's activities (41).

1.6.2.2. Protect people from tobacco smoke

Studies suggest that exposure to second-hand tobacco smoke causes mortality and morbidity due to tobacco related diseases (36). People are most exposed to second-hand smoke in homes and workplaces (42). Smoke free laws have proven to be effective to reduce the exposure to second-hand smoke and enhance indoor quality for people (36). Smoke free laws reduce hospital admission, encourage smoke free homes and automobiles, reduce smoker's consumption, and encourage quit attempts and totally stopping smoking (43, 44).

1.6.2.3. Offer help to quit tobacco use

Smoking can lead to tobacco dependence and many diseases and quitting smoking reduces the risks of smoking-related diseases (45, 46).

The American cancer society suggested that most ex-smokers take 8-10 quit attempts before quitting permanently (47). Most smokers want to quit, but not many people get help to overcome their addiction (48). The most effective cessation intervention should involve brief advice, toll free quit lines and pharmacological therapy (36). Health care providers have responsibility to treat people who want to quit (48) to provide smokers better access to tobacco dependent treatment. Smoking cessation should integrate with primary health care services, toll free telephone help lines should be available at any time, and there should be free pharmacological therapy (32). In addition, all health professionals should become advocates for tobacco control (49).

Smoking cessation and the role of health professionals

Health professionals, including doctors, dentists, nurses, pharmacologists, physiotherapists, etc. have the greatest potential to promote healthy behaviours. This includes encouraging people to quit smoking and, in the end, this will reduce mortality and morbidity due to cigarette smoking (50-53). HPs

as role models should not be smoking themselves; non-smoking HPs will likely be more willing to fight against smoking (54).

A systematic review suggested that brief advice (as part of a minimal intervention) by doctors significantly increased the chances of quitting with relative risk (RR) 1.66, 95% confidence interval (CI) 1.42 to 1.94 compared to no advice (55).

It is not only doctors who can help their patients to quit smoking; other health professionals have their own unique ability to help smokers to stop smoking, for example, dentists. Brief advice by oral health professionals is likely to increase tobacco abstinence rates (odds ratio [OR] 1.71, 95% confidence interval [CI] 1.44 to 2.03) at six months or longer (51). Studies also showed that cigarettes use has significant adverse effects on oral health (52, 56). Thus, dentists can tell patients are smokers by their oral health conditions. Hence, they are well placed to help patients to stop smoking, because dentist's advice on oral health matters is trustworthy, and dentists can modify their advice by referring to their patients' health. In addition, there see many smoking patients visiting their dental office surgeries every day (57).

1.6.2.4. Warning about the dangers of tobacco

Despite studies showing the dangers of smoking, not all smokers understand the health risks of tobacco use (36). Cigarette consumers need to be informed about the dangers of smoking, and warning on tobacco products is effective to communicate the health risks of smoking and of exposure to environmental smoke (40). Furthermore, putting health warning label on cigarette packets is cost effective (36).

Guidelines on how packaging and labelling of tobacco products should appear are listed in the article 11 FCTC. This includes: health warnings on the package of cigarettes using graphic images instead of letters, warnings should appear on both sides (front and back) of the cigarette package, warnings should be large, clear and describe specific smoking-related diseases (38). These methods are proven to be effective in convincing users to quit (36).

In addition to pictorial warnings, anti-tobacco advertisements can warn about tobacco's dangers (58). Well-designed anti-tobacco mass media campaigns have been shown to be effective in increasing quit attempts, reducing adolescent initiation rates, and reducing second-hand smoke exposure (59).

1.6.2.5. Enforce bans on tobacco advertising, promotion, and sponsorship.

Comprehensive bans on advertising, promotion and sponsorship would reduce the sales and consumption of tobacco products especially among youth smokers (60). Tobacco advertising, promotion, and sponsorship (TAPS) bans should cover direct and indirect varieties of promotions. Direct promotions such as advertising on the television, radio, print publications and billboards, while indirect promotions include brand stretching, sponsorships and sale product displays (61).

1.6.2.6. Raise taxes on tobacco

Raising taxes will increase tobacco prices, which in turn reduces smoking prevalence, tobacco use related harms and slightly narrows socioeconomic inequalities in health (62). The WHO suggested that price increases of tobacco through higher taxes are one of the most effective means of reducing smoking prevalence (36). Raising taxes can encourage tobacco users to quit and prevent children from starting to smoke (40). Generally, raising taxes is well accepted by the public and makes an income for government, and the revenues of taxes can also be allocated to support smoking cessation programmes (36).

1.7. Indonesian health system

The Indonesian health system includes a mixture of private and public providers. The private providers include profit and non-profit providers, and individual doctors and midwives who engage in dual practice (working at private clinics and public facilities). The public sector operates under the decentralized government system in Indonesia, with central, provincial, and district government levels. Central government manages tertiary and specialist hospitals, provides strategic direction, sets standards and regulations, and ensures the availability of financial and human resources. Provincial

government duties include oversight of provincial level hospitals, monitoring district health services, and tackling health issues within the province. District/municipal government responsibilities are to manage district/city hospitals and district public health network community health centres (puskesmas). This hierarchical system has interrelated medium- and long-term strategic goals, and annual reports (63).

There are also several other central government ministries and agencies involved in the health sector, including the Ministry of Home Affairs, the Social Security Managing Agency, and National Board of Population and Family Planning. In terms of health care providers, there is a three-tier system, with puskesmas community health care providing the first tier of care for people who live in sub-districts, including polyclinics and family doctors; tier 2, including hospital types B, C, D, and E, which provide for people in district areas; and tier 3, including hospital types A as a referral hospital for all patients that cannot be handled by tiers 1 and 2 clinics/ hospitals (64).

The primary health care (tier 1 health providers) aims to provide affordable medical costs. From the tier 2 hospital types, type C provides outpatient and inpatient services for patients who require more specialised treatment, including the fields of internal medicine, obstetrics and gynaecology, surgical services by special doctors, and paediatrics. Type D hospitals are generally similar, except that they are in transition to type C hospital status.

Type B hospitals provide services by specialists in general and limited subspecialists in every district. Hospital type A is a top referral hospital provider offering more specialist medical services. Hospital type E is a specialist hospital with only one type of health service specialty, such as mental health, leprosy, and lung or heart disease. Type A and B hospitals are handled by the central government.

Table 1-3 shows the tiers of Indonesian health providers.

Table 1-3 Indonesian health providers

| Type | Type hospital | Provide | Services | Handled by | Area |
|--------|-------------------------------------|----------------------------------|--|-------------------------------|--------------|
| Tier 1 | PUSKESMAS (community health centre) | Affordable medical cost | Policlinics and family doctors | District/municipal government | Sub district |
| Tier 2 | Hospital type E | A specialist hospital | One type of health service specialty | Provincial government | District |
| | Hospital type C | Outpatient and inpatient service | Specialist treatment, surgical services, paediatrics | Provincial government | District |
| | Hospital type D | Transition E to type C | Similar with C | Provincial government | District |
| | Hospital type B | Outpatient and inpatient service | Specialist and limited subspecialist | Central government | District |
| Tier 3 | Hospital type A | Top referral | More specialists medical service | Central government | National |

Sources : Peraturan Menteri kesehatan Indonesia nomer 56/2014 (Ministry of Health Republic of Indonesia Regulation number 56/2014) (65).

In 2018 there were 9,993 district public health network puskesmas, comprising 7,917 private clinics, 2,269 public hospitals, 281,082 beds, 544 private hospitals, and 29,628 beds. The ratio of hospital beds to population (per 1000) is 1.17 (66). This ratio is below WHO standards and behind other ASEAN countries (Malaysia 1.9, Singapore 2.4, Brunei 2.7, and Thailand 2.1) (67).

In terms of health expenditure, Indonesia faces many challenges, such as health spending as a proportion of GDP being behind that of low-to-middle income countries' average expenditure, comprising 3.1% of Indonesian GDP in 2012 (63).

1.7.1. Healthcare financing in Indonesia

There were several social insurance initiatives established by the government of Indonesia, such as the Social Safety Net for Health Care, Aseskin, Jamsesnas, and the latest programme Jaminan Kesehatan Nasional (JKN) (National Health Insurance). JKN has been implemented since 2014. All

people living in Indonesia for more than six months are eligible to join the national coverage scheme provided by Badan Penyelenggara Jaminan Sosial (BPJS)/Social Insurance Administration Organization, an authorised body established to provide the medical coverage program. People who need health services must first obtain health services from first tier health facilities, and if they need more advanced services, they have to get referral to go to tier-two hospitals, except in emergency circumstances (64).

In terms of financial protections and equality in health financing, OOPs (Out-of-pocket payments) expenditure is increasing to above global averages, worsened by the fact that around half of the Indonesian population live in rural areas that have limited access to skilled workers and quality medicines. The private health providers command two thirds of health financing, and more than half of all services are in private hands (81). Up until January 2019 there were 216, 152, 549 (82%) people in Indonesia enrolled in the program JKN-KIS and gradually JKN-KIS can afford to cover universal health coverage (UHC) (68).

Healthcare and Social Security Agency's (BPJS) has wide coverage and faced many challenges, one of the biggest was suffering from a huge deficit since 2014 when it was established. However, in 2020 the government raised its premium for the first time to 160,000 rupiah (7,8 GBP) per month per person. This increase is expected to reduce the JKN deficit (83). Private, primarily out-of-pocket (OOPs) expenditure is 60%, while the government share of total health expenditure is still low (39%). These challenges lead to limited access for poor Indonesians to health services (64).

1.7.2. Health professionals in Indonesia

Despite an increasing number of health care professionals, the ratio of physicians to population is still low in some areas, with shortages of nurses and midwives in both hospital and puskesmas levels (69).

The numbers of physicians and dentists is said to be generally sufficient in some places, but distribution is uneven, and access is limited for some. There must be at least one physician and one dentist in each puskesmas in all

locations (village, rural/very rural, or city). In 2015, there were 38.5% puskesmas with more than enough doctors in place, while 35.9% had enough doctors, and 25.5% lack adequate physicians (85). Similarly, the number of dentists is also uneven in some part of Indonesia, and 6.4% of puskesmas have more than enough doctors and dentists, 46.9% have enough, and 46.7% do not have enough physicians or dentists in place (70).

1.7.3. Health situation in Indonesia

The leading causes of morbidity and mortality in Indonesia are stroke, ischemic heart disease, lower respiratory infections, and tuberculosis. The average life expectancy (LE) at birth has increased over the years for both genders. In 1990, the LE for males and females was 63.2 and 66.8 years, respectively. This had improved to 70.1 years and 74.6 years respectively in 2019 (71, 72). The infant mortality rate in Indonesia has fallen greatly over the past decades, from 97 deaths per 1000 live births in 1990 to 26 per 1000 deaths in 2015 (73).

1.8. Economy

Indonesia is a developing country, ranked 111 out of 189 countries in the Human Development Index (HDI) 2019 (89). Indonesia is categorised as a lower middle-income country (74). The Indonesian economy has experienced significant growth in recent years: between 2018 and 2019 annual Gross Domestic Product (GDP) growth was 5 percent, the GDP figure in 2019 was USD 1,022,454 million and USD 7,162 million in 2018 (75, 76). Indonesia had a GDP per capita of USD 3,885 in 2018 increased to USD 3,871 in 2019 (75, 76). In 2019, there were 25.14 million (9.41%) Indonesians are still living below the national poverty line (77) and many more do not have access to basic social services (78, 79).

1.9. Tobacco industry in Indonesia

The first commercial kretek production was a hand-rolled cigarette called 'kretek Klobot' produced by Nitisemito in 1908, under the brand name Bal Tiga, but this home industry was bankrupted due to family affairs. In 1930 the

Bentoel enterprise started to produce cigarettes by using machines to increase cigarette production. This method was then copied by other large companies such as Djarum in 1976, Gudang Garam in 1987, and Sampoerna in 1983 (80).

Tobacco industry has significant presence in Indonesia. The biggest tobacco company in Indonesia is Sampoerna, with 33% market share and 101.4 billion units in annual sales volume. Their market share segment production included a 30.2% share in machine-made kretek, 37.7% share in hand rolled-kretek and 60.9% share in regular cigarette (81). A report published in 2018 showed that the company had a net revenue of Rp. 106.7 trillion (USD 7.15 billion) which increased by 7.7% and 6.8% compared to the years 2017 and 2018 respectively (82). In 2005, Philip Morris bought a 40% stake of Sampoerna for USD 2 billion (81, 83).

The second biggest tobacco company is PT Bentoel Indonesia. In 2009, BAT acquired an 85% stake of Bentoel and increased that to a 99% stake in 2010. In 2011 BAT sold a 15% stake to UBS (Union Bank of Switzerland) London. A Bentoel company report in 2018 showed that the company's net revenue is Rp. 21.9 trillion (USD 1.47 billion) which increased from 19,2 (USD 1.29 billion) to Rp. 20,3 trillion (USD 1.36 billion) in 2016 and 2017 respectively (84).

In Indonesia, the market share is dominated by three large industries: Philip Morris-HM Sampoerna, Gudang Garam, and Djarum. These three companies cover nearly 65% of the market share in Indonesia (80).

Currently, Indonesia is well known as having the fourth highest cigarettes sales volumes worldwide, with 310,575 million cigarettes sold in 2016. The most popular variety produced in Indonesia is kretek, with sales of 252,247 million rolled by machine, and 70,803 million rolled by hand in 2016, compared to only 18,677 million 'regular' cigarettes (rolled by machine /SKM). Kretek dominate the Indonesian tobacco market because of high demand (85).

1.9.1. The role of tobacco industry to the economy

In 2016, three of the five largest global tobacco companies, including British American Tobacco (BAT), Philip Morris International (PMI), and Japan

Tobacco International (JTI), dominated cigarette sales in Southeast Asian countries such as Cambodia, the Philippines, Malaysia, Indonesia, and Singapore. Their sales in these countries were estimated at around USD 27 billion in 2017. Tobacco companies make billions in profits in ASEAN countries, and the tobacco market in the ten nations was worth USD 500 billion in 2016, primarily in Indonesia, the Philippines, Thailand, and Vietnam (86).

There are 6.1 million workers directly and indirectly working for the tobacco industry in Indonesia, including 2 million tobacco farmers, 1.5 million clove farmers, 600,000 workers at cigarette factories, 1 million cigarette retailers, and 1 million workers in printing and cigarette advertising (87). The percentage of labour in the tobacco industries is less than 2 percent of labourers working in other processing industries. Tobacco labourers, in general, are women and they are underpaid (85, 87). The average wage of cigarette industry labourers is less than the average of other industry workers in Indonesia. In 2013, the average wage of cigarette labourer was 1,199,200 IDR (USD 80) monthly; meanwhile, the average in other industries was 1,375,100 IDR (USD 92) monthly (88).

Although for the last five years the top ten richest people in Indonesia have been cigarette tycoons, the cigarette industry's contribution to the Indonesian economy is limited (104). According to data from the Central Bureau of Statistics in Indonesia, the contribution of cigarette companies in Indonesia is never high; in fact, it has consistently decreased over the years (88).

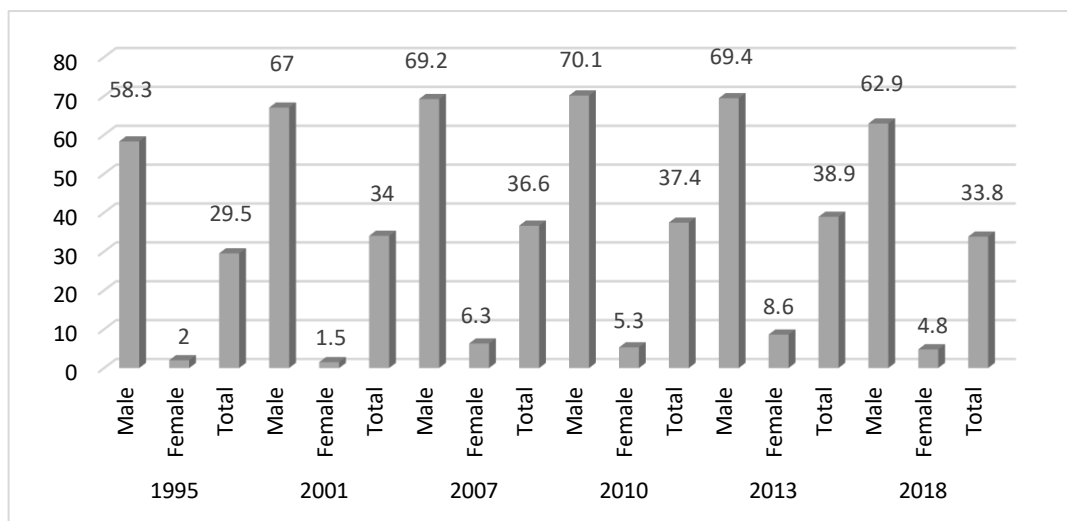
1.9.2. Tobacco uses in Indonesia

Tobacco was first recognised in Indonesia in 1575, when it was introduced by the Spanish. Historically it was mainly smoked locally in pipes or cigarillos, mixed in some cases with opium during the colonial era. Kretek were invented by Haji Djamhari at the end of the 19th century in a small town called Kudus in Central Java (89).

1.9.2.1. Recent prevalence of tobacco consumption population aged ≥15 years.

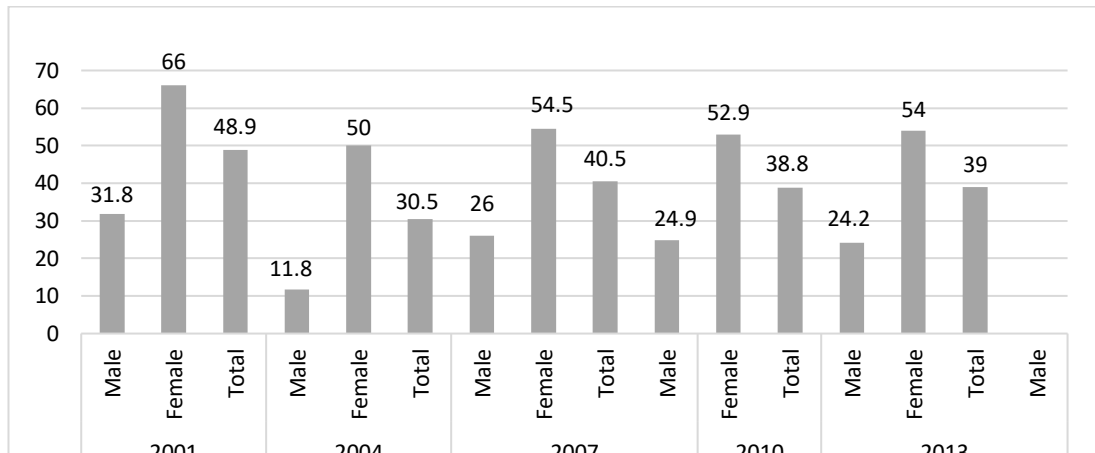
In general, the prevalence of smokers in Indonesia is higher among males compared to females and the prevalence remains high (from 29.5% in 1995 to 33.8% in 2018). Figure 1-3 shows that there was a slightly decrease in the prevalence of smokers from 2013 to 2018 (38.9 to 33.8 respectively), however, this prevalence is still the highest amongst Indonesia’s neighbouring countries. Second-hand smoke exposure is commensurately high (Figure 1-4).

Figure 1-3 Smoking prevalence of people aged ≥ 15 years from 1995-2018



Source: The National Socioeconomic Survey 1995, National Health Survey 2001, Basic Health Research 2007, 2010, 2013, 2018 (34, 90-92).

Figure 1-4 Prevalence of second-hand smoke exposure in Indonesia, 2001-2013



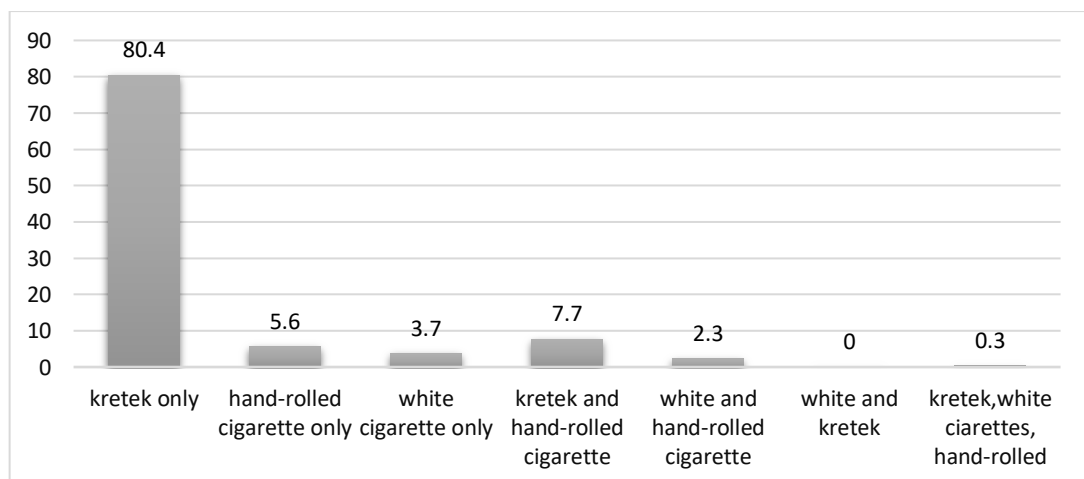
Source: National Health Survey 2001, Basic Health Research 2007, 2010, 2013 (74,106,107) (34, 90, 93).

In Indonesia, the prevalence of passive smoking among non-smoking females is higher than males, and the prevalence of passive smoking has varied slightly over time.

1.9.2.2. Cigarette type consumed by Indonesian smokers

Around 90% of all smokers in Indonesia, or around 54.2 million adult population are smoking kretek (34, 90, 93) (Figure 1-5).

Figure 1-5 Cigarette types consumed by Indonesian smokers



Source: Basic Health Research 2010 (93).

1.9.2.3. Harms from smoking kretek

Originally kretek were essentially a combination of tobacco with cloves, wrapped in dry corn leaves. The name kretek comes from the sound produced when this type of cigarette burns during smoking. Initially, kretek were perceived to be medicinal, and were thought to cure chest pain. Kretek are the most popular cigarette type in Indonesia (94).

A study showed that kretek are associated with increased risk of acute lung injury (i.e. lung damage that can include a range of characteristics such as decreased oxygen, fluid in the lungs, leakage from capillaries, and inflammation), especially among vulnerable individuals with asthma or respiratory infections (95).

Furthermore, eugenol, a key ingredient in kretek, is related to a human carcinogen, a hepatic carcinogen and is associated with an increase in oral cancer (96). Inhaled eugenol numbs pain receptors in the mouth and throat, which decreases the harshness of smoke, thereby making smoking initiation easier (97).

Existing studies indicate that both the machine manufactured, and hand rolled forms of kretek have higher tar levels than a regular cigarette (more than 10 mg tar). The most commonly used mild kretek cigarette has 14 mg of tar and 1 mg of nicotine (95). Although it is not clear whether the high levels of cloves in kretek increase or decrease their toxicity compared with a regular cigarette, there is no scientific basis for concluding that kretek is any less hazardous than regular cigarettes (110). Thus, the health effects of kretek are likely to be at least as detrimental as those of regular cigarette, but this evidence has not yet been systematically reviewed.

1.9.2.4. Prevalence of mortality and morbidity due to smoking-related diseases

Smoking is recognised to be part of the culture and economy, but overall, its use has become a serious and worsening public health problem, hence the need for policies in response to the tobacco epidemic.

Every hour 46 Indonesians die due to smoking-related diseases. In 2013, around 1,741,727 deaths occurred, of which 15% or 240,618 were due to smoking-related diseases (34). In Indonesia, COPD is the leading disease caused by tobacco, followed by coronary heart disease, stroke, lung disease, and trachea and bronchus tumour (34).

Table 1-4 Number of cases of tobacco-related diseases by sex in Indonesia in 2013

| Diseases | Cases | Male | Female |
|--|--------|--------|--------|
| low birth weight | 21605 | 112870 | 103190 |
| Mouth and throat tumour | 6670 | 3350 | 3310 |
| Oesophageal tumour | 1710 | 1010 | 700 |
| Gastric tumour | 10440 | 2780 | 7660 |
| Liver tumour | 13400 | 6740 | 660 |
| Pancreatic tumour | 2910 | 1870 | 1040 |
| Lung tumour | 54300 | 47790 | 6510 |
| Cervical tumour | 28940 | - | 28940 |
| Ovarian tumour | 7690 | - | 7690 |
| Bladder tumour | 10160 | 5990 | 4170 |
| Coronary heart disease | 183950 | 112760 | 71190 |
| Stroke | 144780 | 70410 | 74360 |
| Chronic obstructive pulmonary disease (COPD) | 284310 | 206640 | 77670 |

Source: Tobacco Control Support Centre, bunga rampai, fakta tembakau (tobacco facts), 2014 (88).

Up to 19 in every 100 deaths from coronary heart disease are associated with smoking. At all ages, the smoker's risk is 10-15 times greater than non-smokers (98). The cases of coronary heart disease in Indonesia reached 183,950 in 2013, comprising 112,760 males and 71,190 were females (34).

1.9.2.5. Environmental tobacco smoke in Indonesia

The Indonesia Basic Health Survey in 2013 estimated that 12 million children aged four and under live in households with current smokers. Breathing other people's tobacco smoke's risks are significant. The higher the exposure to

smoke (the more cigarettes the family/partners smoke), the higher the risk for the non-smokers (8).

In Indonesia, where there were 92 million people regularly exposed to tobacco smoke (34), low birth weight is the second most common health condition and low birth weight is a major cause of sudden infant death syndrome. There were 216,050 cases of low birth weight; 112,870 in males and 103,190 in females (34). Studies showed that, nicotine causes lessening in uteroplacental circulation leading to lower maternal weight gain and in turn caused low birth weight (99).

1.9.2.6. Economic loss due to tobacco consumption

In 2013, smoking-related disease accounted for around 6,179,773. Disability Adjusted Life Years (DALYs) in Indonesia (3,602,095 productive male years and 3,290,043 productive female years). This is estimated to account for a loss in productivity of Rp. 235 trillion (USD 15 billion). The total cost of outpatient and inpatient treatment due to smoking-related illness was Rp. 5.35 trillion (or USD 358 million). Thus, in total, in 2013 Indonesia suffered an economic loss due to smoking of Rp. 378.75 trillion (USD 25 million). This significantly exceeds the tax income from cigarettes, which is Rp. 103.02 trillion (USD 6.9 million) (88).

1.9.2.7. Tobacco and poverty in Indonesia

The export ratio for the cigarette industry is very low; 80 percent of cigarette products are domestically consumed, and the poorest Indonesians make the biggest contribution to those sales. Those poorest Indonesians spend more money on cigarettes than on health and education combined. On average, a current kretek cigarette smoker spends 198,761 IDR (USD 13.9) per month on kretek cigarettes (88).

1.10. Progress toward MPOWER

Indonesia has theoretically adopted MPOWER tobacco measures, which include protecting people from tobacco smoke; warning about the dangers of tobacco; enforcing bans on tobacco advertising, promotion, and sponsorship;

raising taxes on tobacco; and reducing the size of cigarettes (48). However, tobacco control measures conducted in Indonesia between 2007 to 2014 were unsuccessful in reducing cigarette use among adults (100). The program to implement MPOWER recommendations in Indonesia is still lacking. WHO reports attribute this to lobbying by the tobacco industry to influence the implementation of adequate tobacco control policy, as manifest in the low uptake of smoke-free policies and advertising bans (101).

1.10.1. Support for smoking cessation in Indonesia

Indonesia has not ratified the FCTC, however, to address the tobacco related diseases that have been a burden to Indonesian governments. Indonesian government have started to adopt several MPOWER measures such as conducting regular tobacco surveys, starting to have smoking cessation clinics and a national toll-free quit line (102). Detailed descriptions on MPOWER measures, what is expected for the WHO highest level of achievement, and Indonesia's achievements to apply the six MPOWER indicators is shown in Table 1-5

Table 1-5 Indonesia's smoking cessation achievements based on six MPOWER indicators

| <i>Indicator</i> | <i>Monitor of tobacco use</i> | <i>Protect from SHS</i> | <i>Offer help to quit tobacco use</i> | <i>Warn about the danger of tobacco</i> | <i>Enforce bans on TAPS</i> | <i>Taxation on tobacco</i> |
|--|---|--|---|--|---|--|
| WHO criteria of highest level of achievement | <p>FCTC article 20 Encourage the use of standards and scientific and evidence-based protocols for tobacco surveys</p> <p>Build capacity on conducting and implementing surveys, as well as disseminating and using their results</p> <p>Develop, maintain and report data to monitor tobacco control policies</p> <p>Develop, maintain and report data on health outcomes related to tobacco use and exposure</p> | <p>FCTC article 8 All public places completely-free: Healthcare facility, educational facility, university, Government facility, Indoor offices, Hospitality venues (Restaurants, bars, pubs, etc.), public transportation</p> | <p>FCTC article 14 A national toll-free quit line, and both NRT and some or all cessation services partially or fully free.</p> | <p>Article 11 Large tobacco warnings covering more than 50% of the front and back of package, describe harmful of tobacco use, located on individual packs and any outside packaging uses in retail sale, the letter is large, clear, visible, and legible, written in (all) principal language(s) of the country, including pictures, specific warnings are mandated and rotated.</p> <p>Comprehensive mass media Campaign about the danger of tobacco.</p> | <p>Article 13 Bans on all cigarette advertising (direct and indirect) : bans on all cigarette advertisements on the national television and radio, local magazine and newspaper, point of sale advertising, free distribution by mail or other means, promotion discounts, non-tobacco goods and services identified with brands names, brand name of non-tobacco goods and services used for tobacco products, sponsored events.</p> | <p>Article 6 Taxes comprise at least 75% of retail price of the most popular brands of cigarettes.</p> |

| | | | | | | |
|---|--|--|--|--|--|--|
| Indonesia's situation | <p>Complete data on proportion of Indonesian adults who currently smoke cigarette daily, occasionally, the age of Indonesian initiate smoking on daily basis, total number of cigarettes that Indonesian smokers consumed daily, type of tobacco products used by Indonesian smokers.</p> <p>Surveys: Basic Health Research, 2007, 2010, 2013, 2018), and surveys of tobacco-related diseases in the country (Global Youth Tobacco Survey (GYTS), 2011, 2014</p> | <p>The Government of Indonesia released government regulation number 109 in 2012 that covers smoke-free zones in schools (including universities), health care facilities and public transports.</p> <p>There were no smoke free laws in government facilities, indoor offices and workplaces, cafes, pubs and bars and restaurants.</p> | <p>Established A national toll-free quit line in 2017.</p> <p>NRT is available in Indonesia's pharmacies and can be purchased without any doctor's prescriptions.</p> <p>NRT is not free (not covered in the national health insurance) nor include as an essential drug.</p> <p>Other non-nicotine pharmacotherapies such as bupropion and varenicline are not available.</p> <p>Smoking cessations are available in some health clinics, hospitals, office of a health professional and community.</p> <p>Cost of smoking cessation support are free in some hospitals and health clinics.</p> | <p>Since 2014, Indonesia have been implemented PHWLs on cigarette (pictorial health warnings cover 40% of the two biggest sides of the packaging of all smoking) describe harmful of tobacco use, located on individual packs and any outside packaging uses in retail sale, the letter is large, clear, visible, and legible, written in Bahasa Indonesia (Indonesian language).</p> <p>The Ministry of Health (Republic of Indonesia) aired national anti-tobacco mass media campaigns on "smoker's cough" from 11-30 August 2017.</p> | <p>No bans on direct and indirect advertising.</p> <p>The only compliance on bans of TAPS is no appearance of tobacco product in TV/films.</p> | <p>Indonesian governments have raised cigarette excise tax by 23% and set a minimum selling price to reach an average of 35% Cigarette price is still affordable</p> |
| Indonesia' achievement based on WHO report on the | Complete policy | Implementation of smoke-free zone in health care facility and schools (except | Moderate policy | Moderate compliance in health warnings and complete policy | No policy | Moderate policy |

Table 1-5 Indonesia's smoking cessation achievements based on six MPOWER indicators

| <i>Indicator</i> | <i>Monitor of tobacco use</i> | <i>Protect from SHS</i> | <i>Offer help to quit tobacco use</i> | <i>Warn about the danger of tobacco</i> | <i>Enforce bans on TAPS</i> | <i>Taxation on tobacco</i> |
|-------------------------------|-------------------------------|--|---------------------------------------|---|-----------------------------|----------------------------|
| global tobacco epidemic, 2019 | | universities) were highly compliance. While Universities and public transports were not compliance. Overall Compliance score was low (4 out of 10 scale) | | in mass media campaign | | |

Source: WHO Framework Convention on Tobacco Control 2003 (37), Country profile Indonesia summary of MPOWER measures in Indonesia 2019 (36), Basic Health Research 2010,2013,2018, GYTS 2011,2015 (4, 34, 93, 103, 104) Peraturan pemerintah nomor 109 tahun 2012 (Government regulation number 109/2012) (105)

1.10.2. The history of tobacco control policy in Indonesia

Indonesia has had increasing regulations about tobacco cigarette use since 1999; these policies aim to combat the tobacco epidemic and protect people's health. The first smoking cigarette use regulation was number 81 in 1999 (106). This law regulated the nicotine and tar level content in cigarettes, as well as product regulations and sales (cigarettes can only be advertised in the printed media), smoke-free area regulation, public disclosure of cigarette content, penalties, and enforcement. However, this regulation did not include the issues of economic liability, sales to minors, and corporate sponsorships. In 2000, this regulation was amended by the next president to the regulation number 38/2000. This regulation reintroduced television advertising, by allowing advertisements to be aired on the television between 10.30 PM and 05.00 AM, and advertisements in the printed paper and outdoors continued to be permitted (107).

With regard to smoke-free legislation, regulation no. 38 was then revised as regulation 19/2003. This proposed smoke-free areas, such as public areas, education facilities, working areas, and public transport, as well as health facilities. This regulation also controls the aspects related to the size and types of messages on health warning labels, as well as tar and nicotine levels (108). This regulation was then amended to regulation number 109/2012. In 2012 government regulation 109/2012 was signed by the President of the Republic of Indonesia; this regulation is still in force today (105). Government regulation 109/2012 includes the regulation of tobacco products, the responsibilities of the government and local government, administrations, community participation and guidance oversight. This regulation sets out several responsibilities of the national and local governments, concerning production and importation, distribution, special protection for children and pregnant women, and smoke-free zones. The regulation also controls the distribution of tobacco cigarettes; for example, it is prohibited to sell cigarettes using a vending machine, or to sell tobacco cigarettes to minors (aged 18 years old or under) and pregnant women (105). However, this regulation is not fully enforced. A recent study showed that Indonesian cigarette retailers admitted selling cigarettes to young people and selling cigarettes as single stick (109).

Current regulation (109/2012) was opposed by the tobacco industry. They argued that higher tax will reduce government revenue, unemployment will grow and is troublesome for tobacco farmers (110).

Indonesian governments have raised cigarette excise tax by 23% and set a minimum selling price to reach an average of 35% per 1 January 2020. Increasing tobacco product tax excises affects the price of cigarettes, making them less affordable for children and the poor. The excise tax increase is known to have a significant effect on the reduction of smoking prevalence and the number of smoking-attributable deaths. Indonesia's tax revenue for tobacco excise in 2019 was Rp. 165.5 billion (USD 11.1 million) (111).

1.11. Rationale for this thesis

This study explores the health risks perceptions of smokers, non-smokers, and HPs in Indonesia. Risk perceptions concern how individuals think and feel about the risks they face (112). Risk perceptions are an important determinant of protective behaviours. Smoking risk is commonly defined as a multiplicative combination of the probability of a hazardous event occurring, and the severity of the resulting negative consequences (e.g. lung cancer) (112).

As has been discussed above about the lack of tobacco control and lack of making cessation programs in Indonesia, it is very important to understand Indonesian health risk perceptions regarding the most popular tobacco product (kretek). Health knowledge about the risk effects of smoking is a very important factor to motivate smokers to quit smoking (113). Increased health knowledge is strongly associated with a reduction in smoking, increased cessation behaviour, and ultimately long-term abstinence from smoking, and less uptake of the habit (112, 114).

This research should aid policymakers in deciding smoking cigarette policy, improving communication between people/ the lay public, health providers, and the government to reduce cigarette use.

1.11.1. Lack of evidence of health effects of kretek cigarettes

Traditional cigarettes have well established and major health implications (10). Kretek is widely used in Indonesia, and the health effects of kretek are likely to be at least as serious as those of regular cigarettes but the evidence has not been systematically reviewed (96, 115). Systematic review of research evidence is an essential scientific activity, usually a systematic review can be faster and less expensive than embarking on a new study (116).

There were many investigations about kretek available; there is a need to draw together all the evidence on the harms and benefits from Indonesia and other places, and synthesis it, pulling out strengths and weakness of that evidence. Systematic reviews are used to synthesis the information, and to assess the quality of the evidence (116).

Tobacco cigarettes are very dangerous products containing more than 7000 chemicals, many of which are known poisons and carcinogens (96, 117).

Both manufactured and hand-rolled kretek cigarettes have higher tar, nicotine, and carbon monoxide (CO) levels than regular cigarettes (118, 119). Nicotine is a very addictive substance, although it is relatively harmless to health in itself(8, 10). Rather the main dangers of smoking arise from smoke itself, including tar (8, 10). Tar, visible as a sticky brown substance that stains smokers' teeth and fingers a yellow-brown colour, contains carcinogens (120), and damages the lungs by narrowing the bronchioles (small tubes that absorb oxygen). It also damages the small hairs (cilia) that protect the lungs from dirt and infection. This can lead to a range of lung diseases, such as chronic obstructive pulmonary disease (COPD) and emphysema (113).

Carbon monoxide is a poisonous gas which takes the place of oxygen in people's blood (10). This forces the heart to work much harder and stops the lungs from working properly and reduces oxygen available to cells and tissues throughout the body. This effect can lead to heart disease and stroke (95). Smoking during pregnancy reduces oxygen to the foetus because of carbon monoxide content in cigarette smoke (121). In addition, absorption of CO by non-smokers exposed to tobacco smoke under experimental conditions is well

documented. Two hours' exposure to 20 ppm CO was equivalent to actively smoking a single cigarette (122, 123).

In addition to having higher tar levels than regular cigarettes, kretek also contain clove buds (15-40%) and other flavourings. Clove buds contribute high levels of eugenol in smoke; eugenol has been classified as a possible human carcinogen, and the 'sauce' used to flavour kretek may also contain harmful ingredients (124). Higher nicotine, tar, and CO in kretek is likely to have different health risk outcomes from regular cigarettes, but the particular implications remain unknown, providing the rationale for conducting a systematic literature review to describe the effect of second-hand exposure to kretek smoke, and to compare this with exposure to regular cigarette smoke.

1.11.2. Lack of evidence of health risks perceptions of Indonesian people regarding the use of kretek and regular cigarettes

To date, research exploring Indonesian smokers and kretek has focused on the social and cultural aspects of smoking behaviour in Indonesia, and most of this is out of date. For example, research by Nawi et al. in 2006 assessed the norms and values of teenage smokers in rural areas of Indonesia. Among male smokers, smoking cigarettes was perceived as a sign of maturity and adulthood. On the other hand, the culture was found to discourage women from smoking cigarettes (125), and a study by Nichter et al in 2009, about the key cultural themes in cigarette advertisements, showed that tobacco industry made efforts to make advertisements that were culturally nuanced to promote their products (126).

Another study by Byron in 2005 explored the influence of religious organizations on the smoke-free law in Bogor, Indonesia; this research concluded that religious leaders should take direct action to support smoke-free regulations. Furthermore, this study pointed out that the implementation of the smoke-free law in Bogor was not adequate, and religious and social norms were not supporting the law. However, it found that people tend to respect the rights of others by not smoking in front of non-smokers, especially children (127).

To our knowledge, no research has specifically investigated the attitudes, knowledge, and health risk perceptions of the Indonesian population regarding the use of kretek.

1.11.3. Lack of evidence of Indonesian HPs knowledge and risks associate to smoking

The evidence suggests health professionals have an important role to encourage people to stop smoking. There have been few studies on health professionals in Indonesia, but those available suggest a high proportion of smokers among Indonesia health professionals, but little is known about their knowledge of the harms of smoking, or their attitudes and behaviour in relation to supporting their patients to quit.

Little is known about the smoking-related attitudes and practises of HPs in Indonesia, but available evidence tentatively suggests that there are still quite high smoking rates among male HPs (26). It is unknown whether they are aware of the risks of smoking in general and if they perceive differences in the risk of kretek and regular cigarettes.

A recent study conducted by Pingak, et al in 2019 (n=197) investigated the health risk perceptions of nurse students in one University in Indonesia, this study suggested that 50 percent of all males participants and 7% of females participants were smokers (128).

Information about Indonesian people's perceptions of the health risks and addictiveness of kretek, and attitudes towards them, is limited. Furthermore, little is known about health care professionals' attitudes to smoking and their patients' tobacco use, and how these influence smoking behaviours in the population. Understanding these issues is essential to understanding why Indonesians use kretek, and thus to design effective tobacco control policy.

To gain an in-depth understanding of these issues, the best research methodology to use is a mixed-methods qualitative-quantitative approach, supported by a systematic review study to understand the health risk of kretek cigarette use. To date, mixed-methods studies exploring Indonesian smokers', non-smokers', and health professionals' knowledge about the health risks of

and attitudes towards kretek cigarettes, have, to our knowledge, not been conducted.

1.12. Mixed methods approach in this study

In mixed methods research, the researcher collects and analyses data using both qualitative and quantitative methods in a single study, integrating the findings and drawing inferences using breadth and depth of understanding and corroboration (129, 130). The synergy of qualitative and quantitative methods is the defining characteristic of mixed methods research, as opposed to multi-method research, which systematically employs different types of methods in concert with one another. Multi-method research involves combining any different methods (131). Multi method research employs two or more different methods within the same study instead of the use of a single method (132). By contrast to mixed methods, which uses a combination of qualitative and quantitative methods, multi methods study is open to the fully variety of possible methodological combination(133).

The benefits of mixed methods are that when the researcher combines both stories and statistical trends the results provide a better understanding of the problem than other trends or stories alone, and gain more complete and holistic picture about the problem (134).

This study used qualitative data to provide a detailed understanding of a smoking problem and to understand Indonesian health risk perceptions by studying samples of Indonesian smokers and non-smokers, exploring their perspectives in great depth. Additionally, quantitative data provide more general understanding of a problem by examining a large number of Indonesian Health professional (physicians and dentists) and assessing responses to several variables.

Different participants in this study were used to provide different perspectives, to provide a complete understanding of the research problem. Qualitative combined with quantitative methods helps to explain the smoking problem in Indonesia, and to gain insights into the risks of kretek arising from the systematic review study.

Besides the benefits of mixed methods research approach, there are also several weakness of this method, including that it is time-consuming, especially for a single researcher, and the researcher must deftly apply and understand both qualitative and quantitative methods, and how to mix them appropriately.

1.12.1. Mixed method research paradigm

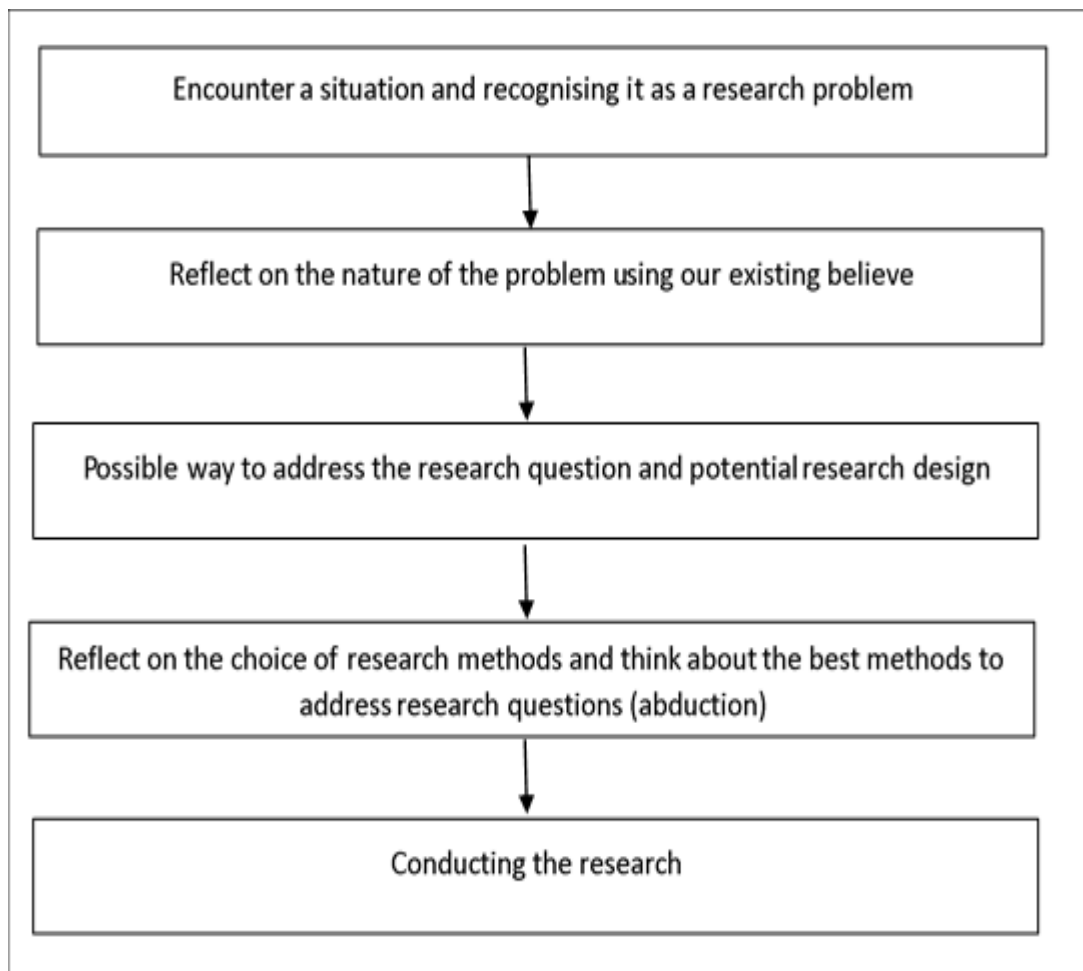
A paradigm comprises the philosophical assumptions or basic set of beliefs that guide the actions and define the worldview of researcher (135). The worldview is a way of thinking about making sense of complexities of the real world (136). Paradigms are conceptual and practical 'tools' that are used to solve specific research problems, in other words, paradigms function as heuristics in social research. Each paradigm has a different perspective on the research axiology, ontology, epistemology, methodology, and rhetoric (136, 137). In order to ensure the rigour of study, it is important that the researcher explicitly describes the decision-making trail within the report to enable clarity by reader (129).

Each worldview has a different perspective. For example, qualitative research is based on the assumption that reality is socially constructed; social constructivism looks at human societies in these terms, positing that people make sense of the world based on their social interactions. In contrast, quantitative research holds the view that reality is independent of personal views and social contents. Post-positivism views truth/ knowledge as objective, which should studied by scientific research methods to measure data numerically, and analyse it statistically (129, 134). The advocacy or participatory worldview focuses on the need of people who are powerless in society, seeking to drive action rather than to reflect on information. Such studies encourage powerless people to make changes in their communities, with help from experts in related subjects (136). The pragmatist worldview avoids speculation about constructs such as truth, rather it defines truth as that which is expedient (136, 138). This is the worldview adopted in the current research, as described below.

1.12.2. An overview of the pragmatic model framework

Teddlie and Tashakkori (2003) found that at least 13 different authors have explicitly advocated the use of pragmatist position in the use of mixed methods design, and that pragmatism is mentioned most often in mixed-methods literature (129, 139). In order to combine qualitative and quantitative study to solve the research problem, Dewey (1993) presented a five-step model for understanding problem solving (Figure 1-6). This framework was then studied and revised by Morgan (2014) to describe a dynamic system of pragmatist research methodology.

Figure 1-6 Pragmatic approach as methodological to problem solving



Adapted from: Dewey, 1993 (140) and Morgan, 2014 (141).

1.12.2.1. Pragmatism as a research paradigm in this study

Not all scholars agree that quantitative and qualitative methods can be logically combined, and it has been argued that in combining methods

pragmatism rejects the traditional dualism of subjectivity and objectivity (129, 136). Measuring the objective view of reality will not necessarily correspond with measuring subjective experiences (136). The solution lies in pragmatism, which posits that human actions can never be separated from the past experiences and beliefs that have originated from those experiences, human thought is intrinsically linked to actions (141). Rather than assigning post-positivism and constructivism in two different ontological and epistemological camps, pragmatism asks the investigator to focus on the two different approaches to inquire (141).

Thus, in this study, the researcher is not committed to any philosophy or way of thinking about reality. Instead, the researcher focuses on the research aims and uses whatever research methods correctly answer the research questions, beneficial to the implementation of solutions to identified problems. The researcher believes that knowledge is always based on experience, and participants' perceptions of the world are influenced by their social experiences (136). Each person's knowledge is unique, as it is created by their unique experiences (142).

1.12.3. Mixed method research design

In order to have rigour, mixed method researchers need to understand the process of selecting and constructing mixed methods research design (136). According to Maxwell (2013), designing mixed method studies is based on the process of design, and design itself as a process (134) The number of possible purposes of mixing quantitative and qualitative study is very large and increasing (134), but Greene (1989) and Bryman (2006) provided classification of the basis of how qualitative and quantitative can relate each other by the purposes and rationale of the study (136). The most important consideration to construct a research design is to consider the unique research situation and questions (136, 142).

Firstly, the researcher needs to consider the purpose of mixing methods in the study. In all cases, the mixing of methods, methodologies, and/ or paradigms will help answer the research questions and improve on a more basic study

design. Fuller and richer information will be obtained from a mixed methods study (129, 143).

Secondly, the researcher should consider theoretically driven approaches deployed in a mixed method study, especially in terms of whether the study is conducted using approaches that are deductive (reasoning from the more general to the more specific) or inductive (moving from specific observations to broader generalisations and theory) (144), or a combination of these.

The third aspect that researcher needs to consider is timing, in terms of simultaneity and dependence. Simultaneity refers to whether the components are to be implemented concurrently. Dependence refers to whether a later component depends on the results of an earlier one (142).

The fourth point is the integration of quantitative and qualitative components.

The fifth is typological vs. integrative aspect, where the researcher makes choices to select a design (typological or interactive approach) to construct ideas (136).

Sixthly, the design must be fully specified during the planning of the research study or the design (part of the design) will be allowed to emerge during the research process or combination of these (136).

Finally, complexity or multilevel design must be considered. A simple research design is a simple investigation with a single point of integration, while a complex one is when there were multiple points of integration. Complexity depends not only on the number of components, but also on the extent to which they depend on each other (e.g. one approach affects the formulation of the other) (134, 136).

1.12.3.1. Summary of underlying theory and approach in this thesis

There are a number of possible selected combination of approaches to conduct mixed methods research. The preferred approaches for this study are described below.

In terms of the philosophical approach, this study adopts pragmatism, which was believed to be the most appropriate way to understand Indonesian health risk perceptions, using a mixed methods study. As explained previously, the smoking problem in Indonesia is a complex issue, involving many aspects such as social, economic, and political factors. The researcher also suggests that pragmatic study is useful to understand people's perceptions of the world as influenced by their social experiences. The health risk perceptions of Indonesian smokers and non-smokers are relatively unexplored in the literature, and this study intends to address this gap by mixing two research methods in order to achieve the study aims. Investigating using a pragmatic approach to combine both quantitative and qualitative data can provide a more holistic and in-depth understanding of the problem than by exploring quantitative and qualitative data alone, gaining a more complete picture about the complex smoking issue in Indonesia. This study uses abduction by carefully designing the research, selecting the methods, reflecting on the choices made by the researcher, and reconsidering the research aims (138).

In terms of theoretical drive, this study uses "equal-status" mixed method research design, meaning the qualitative and quantitative methods used have equal value. This study is neither qualitative nor quantitative driven, rather it is around the centre of the quantitative-qualitative continuum, according each wing equal status. We use a combination of deductive and inductive approaches. Related to the timing of qualitative and quantitative components, this study has a concurrent-independent design, meaning that the data collection in this study collected and displayed side-by-side, based on methodological approaches and the execution of both designs simultaneously and independently. In other words, the implementation of one component does not depend upon the results of others. In this study, quantitative and qualitative strands of the research are performed independently, and their results are brought together in the overall implementations.

1.12.3.2. Reliability and validity in this study

Reliability is the extent to which measurements are repeatable, when different persons perform the measurements, on different times, under different

situations, with supposedly alternative instruments which measure the same thing (145). Reliability is concerned with stability and repeatability as well as consistency of participants accounts, it is also concern with the ability of researcher to collect and record data accurately (146). To achieved reliability in this study, the researcher ensured the provision of detailed description of the research strategy and data analysis (described further in each study chapter in this thesis), with clear explanation of the theoretical point of view, data triangulation (based on the combined and collated use of data from using the different methods described above), and self-reflecting, to keep a self-critical account of the research process (described further in the reflection section of chapter 3).

Internal and external validity were ensured by using well established research methods; familiarisation with Indonesian culture; providing accurate and rich description of research findings; using adequate information for evaluating the analysis of data; providing details of the study participants to allow evaluation of which target groups are provided with valuable information; and making sure that the findings are the results of the experiences and thoughts of the informants, and not the characteristics and preferences of the researcher. These concepts are described further in the following chapter.

1.13. The aim and objectives of this thesis

The aim of this thesis to gain a better understanding of the health risks of kretek as well as the health risk perceptions of Indonesian population regarding the use of kretek. This study aims to understand the health risk of smoking kretek use compared with regular cigarettes use and obtain a better understanding of the role of kretek in the lives of Indonesian people, including their perceptions of the health risks and benefits in smokers, non-smokers and health professionals.

The specific objectives are:

1. To systematically review the evidence on the health risks associated with kretek smoking compared with not smoking.

2. To systematically review the evidence on the health risks associated with kretek use compared with that of regular cigarette smoking.
3. To describe the effect of second-hand exposure to kretek and regular cigarette smoke.
4. To understand Indonesians' smoking behaviour and their attitudes and beliefs about the benefits and harms of regular and kretek cigarettes.
5. To understand Indonesians' attitudes and concerns of non-smokers to the use of regular and kretek cigarettes by family or friends, and their perceptions of the health risks or benefits associated with smoking cigarettes.
6. To quantify health care providers' (doctors and dentists) use of kretek and regular cigarettes, their knowledge of the risks associated with both types of cigarette, and the support and advice they provide to their patient

CHAPTER 2

SYSTEMATIC REVIEW OF KRETEK CIGARETTE HEALTH RISKS

2.1. Introduction

The introduction chapter of this thesis described the many health hazards associated with smoking regular cigarettes and kretek. Given the constituents of kretek, there is no scientific basis for concluding that a kretek is any less hazardous than a regular cigarette (95). Thus, the health effects of kretek are likely to be at least as detrimental as those of regular cigarettes. However, the evidence has not been systematically reviewed. This chapter, therefore, aims to systematically synthesize and review the evidence from studies which have compared the health risks of kretek smoking compared with not smoking or regular cigarettes. This chapter, therefore, aims to systematically synthesize and review the evidence from studies which have compared the health risks of kretek smoking compared with not smoking or smoking regular cigarettes.

2.2. Methods

PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) guidelines were used to conduct this systematic review (136). The study protocol was published in PROSPERO (registration number CRD42017079757).

2.2.1. Study selection

Throughout the review process, this study used PECOS (Population-Exposure-Comparison-Outcomes-Study design) (Appendix 1) to assess the eligibility of the identified studies.

2.2.2. Population

This study included any population around the world.

2.2.3. Exposure

This study included all studies assessing kretek cigarette consumption, people who smoke kretek cigarettes, and people exposed to kretek cigarettes (involuntarily inhaling kretek cigarette smoke).

2.2.4. Comparison

This study included studies comparing current kretek smokers with non-smokers, current kretek smokers with regular cigarette smokers, non-smokers passively exposed to kretek cigarettes alongside unexposed non-smokers, or non-smokers exposed to regular cigarettes.

2.2.5. Types of outcomes

This study included studies assessing the short-term health effects and long-term health consequences of smoking kretek cigarettes or exposure to kretek cigarettes, as well as any benefits to health from the use of kretek cigarettes (if any). Any physical or mental health or health-related outcome was included.

2.2.6. Type of study design

This study included (if any) existing systematic review studies, comparative longitudinal studies, or cohort studies, assessing the associated health risk of kretek cigarettes. Case-control and cross-sectional studies were also included.

2.2.7. Inclusion criteria

Most cigarettes consumed in Indonesia are kretek cigarettes (120,133), thus, this study included any studies on the health effects of smoking in Indonesia. Studies conducted in Indonesia that did not specifically mention whether the exposure was kretek cigarettes (as opposed to regular cigarettes) were analysed separately. There was no restriction regarding the publication period. However, only relevant studies' records in Bahasa Indonesian and English were included.

2.2.8. Exclusion criteria

Experimental animal studies were excluded.

2.2.9. Search strategy

This study conducted a thorough literature search and identified relevant peer-reviewed studies using a comprehensive search of literature databases. To identify additional, geographically relevant information (i.e. Indonesian studies), The researcher conducted an internet search for grey literature and a search in Indonesian medical journals. The search strategy was developed with the support of an expert librarian; multiple search strategies were tested to ensure that a comprehensive list of references was identified.

The researcher searched five major electronic databases: EMBASE (Ovid), ASSIA (Applied Social Science Index and Abstracts), PubMed, Scopus, and the Cochrane Library. Furthermore, the search included media reports, government and non-governments reports, such as those by the WHO (World Health Organization), all medicine and public health journals in Indonesia (from 82 universities in Indonesia), and the National Library of Indonesia. Search terms are included the following keywords and are presented in full in Appendix 2: “kretek”, or “clove cigarettes” or “rokok” or “merokok”.

The researcher conducted electronic searches to include all materials up to and including September 2017. Since kretek cigarettes are predominantly used in Indonesia, the search strategy included relevant terms in the Indonesian language as well as English.

2.2.10. Study selection

The first step of study selection was to check and remove all duplicates (DN). Then, double screening of abstracts was conducted by DN and TL.

The full texts of potentially eligible articles were identified and read independently by two reviewers (TL & DN), to check if they were in line with the inclusion criteria. Disagreements were resolved through discussion with a third reviewer (SL).

For the articles in Bahasa Indonesian, full texts of potentially eligible articles were identified and read by (DN) and discussed in English with TL and SL.

2.2.11. Data extraction

Study data were extracted by a single reviewer (DN) were checked by TS and SL. After data extraction, several additional publications were excluded, and the reasons for this recorded.

2.2.12. Study records

All references were imported into and managed in Endnote X10, Thomson Reuters, San Francisco, CA.

2.2.13. Quality assessment method

The assessment of the methodological quality of the primary studies was conducted using the Newcastle-Ottawa scale (NOS) (Appendix 3) (147). NOS is an assessment tool for observational studies and is recommended by the Cochrane collaboration (147). All the included studies were cross-sectional or case-control studies. Newcastle Ottawa Scale (NOS) is one of the most used worldwide for cross-sectional and longitudinal studies (148). The NOS can be used for both case-control and longitudinal (prospective studies). Typically, cross-sectional studies are evaluated as case-control studies (148). The NOS evaluates three quality parameters (selection, comparability, and outcome) (Appendix 5) (148, 149), divided across eight specific items, which slightly differ when scoring case-control and longitudinal studies (149).

In the NOS assessment for case-control studies, a study can be awarded a maximum of 9 stars: 1 star for each numbered item within the selection and exposure categories and a maximum of 2 stars for comparability In the NOS assessment for cross-sectional studies, the maximum potential stars awarded is 10 (149).

Three researchers (TL, SL, & DN) independently assessed the quality of the studies. The disagreement between the researchers was resolved by discussion. For articles in Bahasa Indonesia language, DN described the studies in English to SL and TL, and together they assessed the quality of the studies.

2.3. Results

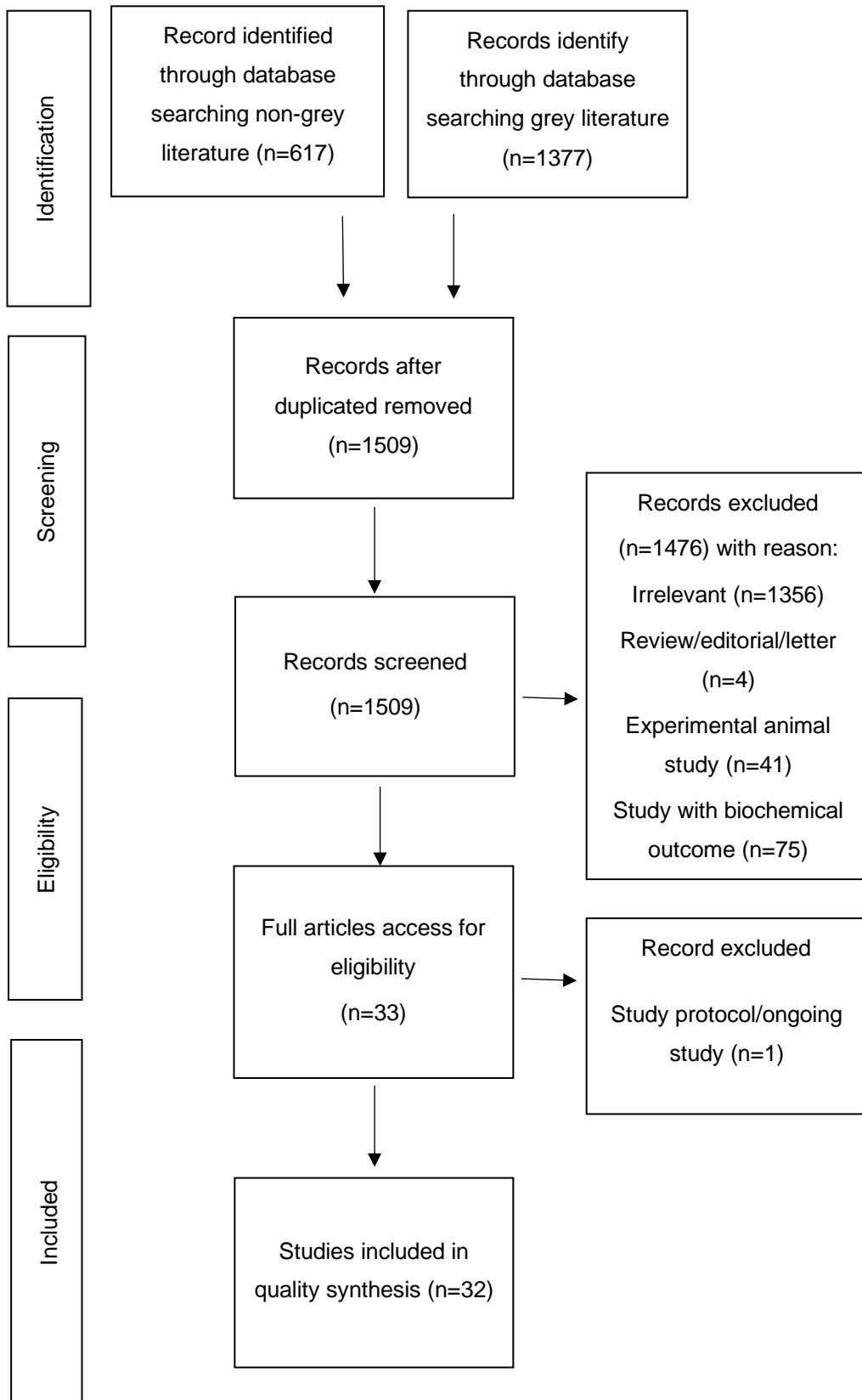
2.3.1. Overview of included studies

Our literature search identified 1509 articles; following title and abstract screening, the researcher reviewed that full texts of 33 that were potentially relevant. 32 studies met the inclusion criteria and were included in the narrative synthesis. Fourteen studies looked specifically at kretek exposure, and 18 studies looked at any type of cigarette exposure but were conducted in Indonesia are therefore likely to predominantly reflect kretek exposure. Summaries the process of study selection (Figure 2-1).

Studies looking specifically at the association between active kretek cigarette exposure and health risks looked at the following outcomes: oral cancer (150) cardiovascular disease (151), coronary heart disease (152), myocardial infarction (153), asthma (154), dental decay (155), taste sensitivity (156), stomatitis nicotine (157), periodontal disease (158), coated tongue (159), oral mucous lesion (160), Waist-hip ratio (161), hyperpigmentation in the face (162). One study looked at the association between passive kretek exposure and melanin gingiva pigmentation (163).

Studies investigating the association between unspecified cigarettes (i.e. not specifically kretek) exposure and health outcomes looked at hypertension (164-168), coronary heart disease (169), Forced Expiratory flow 25-75% (170), cardiorespiratory endurance (171, 172), asthma (173), lung tuberculosis (174), depression (162), insomnia (175), obesity (176), eye cataract (177), Parkinson's disease (178) and oral gingivitis (179).

Figure 2-1 Flow chart of study selection



2.3.2. Study characteristics

The characteristics of the 32 studies included in this systematic review are shown in Table 2-1. There were 31 cross-sectional studies and one case control study. All included studies were conducted in Indonesia. 17 studies included only men, no study included only women and one study included children. Studies were conducted in different populations: patients in hospital (eight studies) (150, 152, 153, 163, 167, 169, 173, 178); students in universities/schools (eight studies) (159, 162, 171, 172, 175, 176, 179, 180); national surveys (four studies) (151, 154, 174, 181); drivers – bus (155), and pedicab (156); local populations/villages (six studies) (160, 164-166, 168, 170); farmers (177); miners (157); and fisherman (161). One study did not describe the population (158).

The measurement of outcomes varied, diagnosed by the researchers, medical records, and interviews. Smoking status was mostly ascertained through self-reporting; one did not mention the ascertainment method.

Two studies compared kretek with not smoking and regular cigarettes (150, 151); one study compared kretek smoking and not smoking (156); seven studies compared kretek with regular cigarettes (152, 154, 157-160, 180); 10 studies compared unspecified type of cigarette and not smoking (164, 167, 169, 170, 172, 174-176, 178, 181); one study compared filter and not smoking and non-filter (166); 6 studies investigated unspecified type of cigarette without comparator (162, 165, 168, 171, 173, 179); 1 study compared unspecified type of cigarette, not smoking, and ex-smokers (177); two studies compared kretek with kretek based on level of consumption and nicotine content (153, 155); one study investigated kretek and passive smoking (163); 5 studies adjusted for confounders a variety of confounders (location, age, gender, educational status, etc.) (150, 151, 153, 154, 178).

2.3.3. Quality assessment

None of the included studies were found to be of high quality (Table 2-1). The main reasons for lower scores in the risk of bias assessment were potential for selection bias because of lack of data on non-respondents or those lost to follow up and lack of justification of sample size.

2.3.3.1. Summary of findings on the health effects of kretek

Fourteen studies found a significant association between smoking kretek cigarettes and several health risks: cancer (150), disease of circulatory system and blood respiratory disease (151-153), dental and oral health except oral cancer (155-161, 180), endocrine nutritional and metabolic disease (161). One study found a significant association between passive kretek exposure and oral health (163). One study did not find a significant association between smoking kretek cigarettes and skin problems (180). 18 studies found a significant association between smoking any type of cigarettes and several health risks of disease of the blood and circulatory (164-166, 168, 171, 172), respiratory system (170), mental health (175, 181), eyes disease (177), nervous system (178), oral health (179). Six studies did not find any association between any type of cigarettes and the following health conditions; hypertension stages (167), coronary heart disease with single, double or triple vessel disease (169), asthma (173), tuberculosis (174), depression (162), overweight (176).

Most studies reported associations between smoking and health outcomes. For example, 14 studies reported the p-value only (152, 153, 156, 159, 163, 164, 168, 170, 172, 174-176, 178, 180), four studies provided effect size only (157, 160, 166, 179), four studies provided correlation coefficient and p-value (162, 169, 171, 173), one study provided mean difference and p-value (161), two studies provided OR, CI, and p-value (154, 177), one study provided CI and p-value (167), one study provided OR only (181); one study provided OR and p-value (158), one study provided relative risk and p-value (155), one study provided correlation coefficient only (165), and two studies provided OR and CI (150, 151).

Studies assessing the association between kretek use and health outcomes

Cancer

Amtha et al. (150) found that among 81 cases of oral cancer and 162 controls (non-oral cancer), in a hospital setting, after adjusting for alcohol consumption, betel chewing and dietary pattern, smokers of any type of cigarettes had twice

the risk (OR 2.08, 95% CI 1.01-4.43) of having oral cancer as compared to non-smokers. Kretek smokers were found to have almost double the risk of oral cancer (OR 1.91, 95% CI 0.98-3.95) compared to smokers of other types of cigarettes.

Cardiovascular disease (CVD)

Wasis et al. (151) found that among 109,900 participants aged 45+ in the Indonesia Basic Health Survey 2007, after adjusting for the population's residence area, urban-rural, age, level of education and level of expenditure, mixed smokers (kretek and regular cigarettes) had higher risk of CVD (OR 1.37, 95% CI 1.25-1.49) compared to non-smokers. Non-kretek smokers had a slightly higher risk of CVD (OR 1.16, 95% CI 1.06-1.27) compared to non-smokers, as did kretek smokers (OR 1.09, 95% CI 1.02-1.11).

Afriyanti et al. (152) found that among 47 kretek smokers and 23 regular cigarette smokers in a hospital setting, kretek cigarette smokers had an increased risk of coronary heart disease ($p=0.0001$).

Wagiu et al. (153) reported among 31 kretek smoker participants with myocardial infarction (MI) and 31 without MI in a hospital setting, a higher level of cigarette consumption increased the risk of MI ($p=0.001$).

Respiratory disease

Suharmiati et al. (154) found that among 15,245 participants in the 2007 Basic Health Survey, after adjusting for confounding factors (age, sex, education, and occupation), kretek cigarettes smokers had a higher risk of asthma (OR 1.3, $p<0.001$) than non-kretek cigarette smokers.

Dental and oral health

Soertiato et al. (155) found that among 1160 male kretek smokers, smoking 7-12 kretek cigarettes a day increased the risk of having dental decay (2.66, $p<0.0001$), smoking 13-18 kretek cigarettes daily increased the risk threefold (OR 3.19, $p<0.0001$), as did smoking over 18 kretek cigarettes a day (OR 2.96, $p<0.0001$) as compared to those smoking 0-6 kretek cigarettes a day.

Simamora et al. (156) found that among 37 kretek smokers and 37 non-smokers, kretek smokers' bitter taste sensitivity was higher than that of non-smokers ($p=0.001$). There were no significant differences between sweet ($p=0.39$), sour ($p=0.402$), and salty ($p=0.07$) taste buds' receptors between kretek smokers and non-smokers.

Siwi et al. (157) found that among 94 male smoking miners from Ratatotok Indonesia, the majority of participants who suffered nicotine stomatitis smoked regular cigarettes, had been smokers for more than 20 years and smoked more than 20 cigarettes daily.

Nelis et al. (158) found that among 80 male smokers (40 kretek and 40 non-kretek smokers), kretek smokers had a five times increased risk (OR 5.174 $p=0.006$) of periodontal disease as compared to regular cigarettes smokers.

Kaur et al. (159) found that among 68 males; 24 regular cigarette smokers and 44 kretek cigarette smokers, smoking kretek increased the risk of having a coated tongue ($p=0.0001$) as compared to regular cigarette smokers.

Djokja et al. (160) found that among 80 male smokers, the majority of those smoking mixed cigarettes (kretek and regular cigarettes) had oral mucous lesion (92.2%), and the majority of regular cigarette smokers had oral mucous lesion (81.25%).

Endocrine nutritional and metabolic diseases

Khaira et al. (161) found that among 103 fishermen, smoking kretek cigarettes with a higher nicotine level (>1.5 mg/cigarette) increased the risk of higher waist-hip ratio (WHR) (mean 0.9 ± 0.05) as compared to smoking kretek cigarettes with lower nicotine level (<1.1 mg/cigs) (0.86 ± 0.05) $p= 0.025$.

Skin problems

Prasetya et al. (180) found that among 15 regular cigarette smokers, 6 kretek smokers and 13 mixed kretek and regular smokers, there was no significant relationship between smoking status ($p=0.43$), duration and history of smoking ($p=0.25$), and types of cigarettes consumed (kretek vs. non-kretek) ($p=0.32$) and face hyperpigmentation.

Studies investigating the association between passive kretek smoke exposure and health outcomes

Melanin pigmentation of the gingiva

Setiadhi et al. (163) found that among 91 children who were non-smokers (3-12 years); 31 children had fathers who were smokers of any type of cigarettes, 30 had both a mother and father who smoked and 30 had a non-smoking father and mother. Children with a smoking father and mother had an increased risk of pigmentation at the labial gingiva ($p < 0.001$ and $p < 0.0001$ respectively). Children with a father who smoked kretek cigarettes had increased risk of pigmentation at the labial gingiva ($p < 0.001$). There was no significant correlation between mother being smoker of kretek cigarettes and increased risk of children' pigmentation at the labial gingiva ($p = 0.063$).

Studies investigating the association between unspecified cigarette use and health outcomes

Cardiovascular disease

Yashinta et al. (164) found that among 92 male participants (57 smokers and 35 non-smokers), smoking any type of cigarettes increased the risk of hypertension ($p = 0.0003$). Smokers that had smoked for a longer duration had an increased risk of having hypertension ($p = 0.017$) and smoking non-filter cigarettes increased the risk of having hypertension ($p = 0.017$).

Untari et al. (165) found that among 30 smokers having hypertension, there was a relatively strong correlation between number of cigarettes smoked per day and hypertension ($r_s = 0.46$, $P = 0.01$).

Narayana et al. (166) found that among 70 participants (23 smokers and 47 non-smokers), smoking any type of cigarettes increased the risk of hypertension. 52% of smokers had hypertension, and 27.7% non-smokers had hypertension.

Santosa et al. (167) found that among 75 (60 females and 15 males) patients in a hospital setting, smoking any type of cigarettes had no significant association with increased risk of stage one hypertension (systolic 130-139 mm Hg, diastolic 80-80 mm Hg) and stage two hypertension (systolic 140 mm

Hg or higher and diastolic 90 mm Hg or higher) ($p=1.00$, OR 0.94, 95%CI 0.11-2.8).

Hikmah et al. (168) found that among 23 male smokers, a longer duration of smoking increased the risk of having more severe hypertension ($p=0.042$).

Ramandika et al. (169) found that among 153 CHD patients in a hospital setting, smoking cigarettes had no significant effect on the risk of patients having single, double and triple vessel disease CHD (OR= 1.23, $p=0.56$, $r=0.041$, 95% CI 0.603-2.5 (OR=0.88 ($p=0.73$), $r=0.02$ (95%CI 0.45-1.74) and OR=0.93 ($p=0.83$) $r=0.016$ (95% CI 0.48-1.79) respectively.

Respiratory disease

Sukmawati et al. (170) found that among 48 smokers and 48 non-smokers, mean FVC was lower in smokers (87.02 \pm 16.05) than non-smokers (93.58 \pm 14.14), as was FEV1.

Erawati et al. (171) found that among 40 males (31 smokers and 9 non-smokers), smoking more cigarettes daily lowered cardiorespiratory endurance ($r=0.497$, $p=0.0001$).

Rizaldy et al. (172) found that among 111 high school students, smoking cigarettes lowered cardiorespiratory endurance.

Putra et al. (173) found that among 49 males and 1 female patients had asthma in a hospital setting, smoking cigarettes had no significant correlation with increased risk of asthma ($r=0.157$, $p=0.275$).

Ernawati et al. (174) found that among 1777 participants (15+), in the Indonesia Basic Health Survey 2010, smoking cigarettes did not increase the risk of tuberculosis ($p=0.489$).

Mental health

Wibowo et al. (162) found that among 33 males university students cigarette smoking had no significant effect on the risk of depression ($p=1.00$).

Peng et al. (181) found that among 3061 male and female participants, in the Indonesia Family Life Survey 2007, moderate and heavy smokers increased the risk of depression nearly threefold (OR 2.875) compared with non-smokers.

Annahri, et al. (175) found that among 108 students cigarette smoking increased the risk of insomnia ($p=0.027$) as compared to non-smokers.

Endocrine, nutritional, and metabolic disease

Lestari et al. (176) found that among 80 participants (12 smokers and 68 non-smokers) smoking cigarettes had no significant effect on the risk of higher Body Mass Index (BMI) ($p>0.005$) as compared to non-smokers.

Cataracts

Tana et al. (177) found that among 1223 (566 smokers, 76 ex-smokers, 581 non-smokers), smoking cigarettes increased the risk of eye cataracts twofold (OR 2.17 95%CI 1.71-2.75; $p=0.001$) as compared to non-smokers.

Nervous system

Noviani et al. (178) found that among 68 participants (34 with Parkinson's and 34 controls) in a hospital setting, cigarette smoking decreased the risk of Parkinson's ($p=0.002$) as compared to non-smokers.

Oral health

Syawal et al. (179) found that in a sample of 29 participants there was no association between the level of cigarettes consumed and oral hygiene status.

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|--|--------------|--|--|---|--|
| Case-control studies | | | | | |
| Cancer | | | | | |
| Amtha et al., 2014, Indonesia | Oral cancer | Adult hospital patients; Jakarta, Indonesia; n=243 | Kretek vs. other cigarette smokers | No description, but differentiates between non-kretek and kretek smokers | AOR ¹ 1.91(95% CI 0.98-3.95) for kretek cigarette vs. other cigarette type smokers. |
| Cross-sectional studies | | | | | |
| Diseases of blood and circulatory system | | | | | |
| Wasis et al., 2011, Indonesia | CVD | Adult males; Basic Health Survey, 2007, Indonesia; n=100,009 | Mixed (kretek and non-kretek cigarettes) vs. non-smokers, non-kretek smokers vs. non-smokers, kretek smokers vs. non-smokers | Never, former, occasional smokers | AOR 1.37 (95% CI 1.25-1.49) for mixed kretek and non-kretek cigarette smokers vs. non-smokers AOR 1.16 (95% CI 1.06-1.27) for non-kretek smokers vs. non-smokers AOR 1.09 (95% CI 1.02-1.17) for kretek smokers vs. non-smokers |
| Yashinta et al., 2015, Indonesia | Hypertension | Adult males; local populations, Indonesia; n=92 | Unspecified cigarettes vs. non-smokers | Duration of smoking <10 years, 10-20, >20. Number cigarettes consumed daily: <10, 10-20, >20 | Significant correlation between smoking and hypertension; r not reported; (p=0.0003). Type of cigarettes and hypertension (p=0.017) No significant correlation between duration of smoking and hypertension (p=0.071) or the number of cigarettes consumed daily and hypertension. p=0.412) |

¹ adjusted odds ratio

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|-----------------------------------|-----------------------|--|---|---|--|
| Wagiu et al., 2016, Indonesia | Myocardial infarction | Young adult hospital patients; DR Kandao Hospital, Indonesia; n=62 | Kretek vs. kretek based on degree of smoking | Index -Brinkman for the degree of smoking | Significant correlation between the level of smoking and MI (r not reported, p=0.0001) |
| Untari, 2010, Indonesia | Hypertension | Adult populations; local villages, Indonesia; n=140 | Unspecified cigarettes. No comparator. | Number cigarettes consumed daily <10; 10-20, >20 | Significant correlation between the number of cigarettes consumed daily and degree of hypertension (r=0.46, p=0.01) |
| Ramandika et al., 2012, Indonesia | CHD | Adult hospital patients; Karidao Hospital, Indonesia; n=153 | Unspecified cigarettes vs. non-smokers | No description | No significant correlation between smoking and CHD with: Single vessel disease (r=0.041, p=0.561) Double vessel disease (r=0.028, p=0.730) Triple vessel disease (r=0.016, p=0.839) No significant correlation between smoking and single, double and triple vessel disease (r=0.048, p=0.841) |
| Narayana et al., 2013, Indonesia | Hypertension | Adult populations; local villages, Indonesia; n=70 | Filter and non-filter vs. non-smokers, filter vs. non-filter cigarettes | No description but differentiates between filter and non-filter cigarettes. | 52.2% of smokers (n=12) and 27.2% of non-smokers (n=13) were diagnosed with hypertension. |
| Santosa et al., 2016, Indonesia | Hypertension | Adult hospital patients; Kenduri health centre, Indonesia; n=75 | Unspecified cigarettes vs. non-smokers | Smoking any type of cigarette | No significant correlation between smoking and hypertension stage I and stage II (p=1.000; OR =0.942, 95% CI 0.18-5.05) |

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|------------------------------------|--------------|---|--|---|--|
| Hikmah et al., 2012, Indonesia | Hypertension | Adult males; local population/villages; Indonesia, n=23 | Unspecified cigarettes. No comparator. | Duration of smoking <10 years, 10-20, > 20 | Significant correlation between duration of smoking and degree of hypertension in male smokers (r is not reported, p=0.042) |
| Ratnawulan et al., 2015, Indonesia | CHD | Adult hospital patients; DR. Kandao Hospital, Indonesia; n=69 | Kretek vs. regular cigarettes | No description but differentiates between regular cigarettes and kretek | Significant correlation between duration of smoking and CHD (r is not reported, p=0.01), type of cigarette consumed, and CHD (p=0.014) type of cigarette consumed and non-CHD (p=0.001). |

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|------------------------------------|---|---|--|--|---|
| Respiratory diseases | | | | | |
| Sukmawati et al., 2016, Indonesia | Pulmonary function (FEF25-75%, FVC1, FEV1, and FEV/FVC) | Adult local populations; Indonesia, n=96 | Unspecified cigarettes vs. non-smokers | No description | Lower mean FVC in smokers (87.02± 19.05) than non-smokers (93.58±14.14) p=0.0036, FEV1 in smokers (82.63±14.47) than non-smokers (94.6±14.43) p<0.0001, FEV1/FVC in smokers (91.77±10.92) than non-smokers (101±9.28) p<0.0001, FEF 25-75% in smokers (66.2±23.58) than non-smokers (96.23±30.43) p<0.0001. |
| Suharmiati et al., 2010, Indonesia | Asthma | Population age 10+; Basic Health Research survey 2007, Indonesia; n=15254 | Kretek and regular cigarettes | Daily smokers or occasional smokers | AOR 1.303 for kretek smokers vs. non-smokers, p< 0.001 |
| Rizaldy et al., 2016, Indonesia | Cardio- respiratory endurance | Young adult school students; Indonesia; n=111 | Unspecified cigarettes vs. non-smokers | Age of starting smoking 7-15 years, duration of smoking 0-30 days, number of cigarettes consumed daily 0->20 | Significant difference between cardiorespiratory endurance of smokers and non-smokers p< 0.001 |
| Erawati et al., 2014, Indonesia | Cardio- respiratory endurance | Adult university staff; Indonesia; n=48 | Unspecified cigarettes. No comparator. | Index Brinkman for the degree of smoking | Significant correlation between the level of smoking (BI) and cardiorespiratory endurance (r=-0.497, p<0.001) |

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|----------------------------------|---------------------------|--|--|--|---|
| Putra et al., 2012, Indonesia | Asthma | Adult hospital patients; DR Djamil hospital, Indonesia; n=228 | Unspecified cigarettes. No comparator. | Index Brinkman for the degree of smoking | No significant correlation between the level of smoking (BI) and degree of asthma exacerbations ($r=0.157$, $p=0.275$) |
| Ernawati et al., 2017, Indonesia | Tuberculosis of the lungs | Adult population; Basic Health Research survey 2010, Indonesia; n=1777 | Unspecified cigarettes vs. non-smokers | Daily smokers or occasional smokers | No significant correlation between smoking status and tuberculosis (r not reported, $p=0.489$) |

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|----------------------------------|---------------------|---|---|--|---|
| Oral disease (except cancer) | | | | | |
| Soetiarto, 1998, Indonesia | Dental decay | Adult male bus drivers; Jakarta, Indonesia; n=1160 | Kretek vs. kretek based on number of cigarettes consumed daily | Duration of smoking 6-10 years, 11-15, >15 | RR ² 2.66 (p<0.001) for smoking 7-12 cigarettes daily vs. 0-6 cigarettes daily. RR 3.19 (p<0.0001) for smoking more than 18 cigarettes daily vs 13-18 cigarettes daily |
| Simamora et al., 2017, Indonesia | Taste sensitivity | Adult male pedicab drivers; Medan, Indonesia; n=74 | Kretek vs. non-smokers | Number of cigarettes consumed daily > 5 | Significantly decreased taste perception among smokers compared to non-smokers (p=0.005) between kretek smokers and non-smokers in the sensitivity of taste buds between sweet (p=0.39), sour (p=0.402), and salty (p=0.07) |
| Syawal et al., 2015, Indonesia | Gingivitis | Adult males university staff; UNISBA, Indonesia; n=33 | Unspecified cigarettes. No comparator. | No description | Among 18 light smokers: 10 had good oral hygiene, 8 had fair oral hygiene. Among 8 moderate smokers, 6 had fair oral hygiene and 2 had good oral hygiene. Among 3 heavy smokers, 2 had good oral hygiene, and 1 had fair oral hygiene. |
| Siwi et al., 2017, Indonesia | Stomatitis nicotine | Adult males gold miners; West Sulawesi, Indonesia; n=94 | Kretek vs regular cigarettes, mixed (kretek and regular cigarettes) vs regular cigarettes | Duration of smoking >1 year | Among 94 respondents, 74 (78.7%) had stomatitis nicotine. Among 64 regular cigarette smokers, 54 (55.3%) had stomatitis nicotine, one kretek smoker had stomatitis nicotine, while 21 (22.3%) of mixed kretek and regular cigarette smokers had stomatitis nicotine. The number of people who have stomatitis nicotine in the smokers who smoke less than 10, 10-20 and more than 20 cigarettes daily were 7 (7.4%), 25 (26.6%), 42 (44.5%) respectively. |

² Relative risk

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|---------------------------------|--------------------------------|---|--|---|---|
| Setiadi et al., 2011, Indonesia | Pigmentation at labial gingiva | Child (aged 0-14) hospital patients; University of Padjajaran hospital, Indonesia; n=90 | Father and mother smoking mixed kretek and regular cigarettes, father smoking kretek cigarettes, mother smoking kretek cigarettes. | Passive smoking | Significant association between father's and mother's smoking and the children's pigmentation of labial gingiva ($p<0.001$) and ($p<0.001$). Significant association between father's smoking kretek and children's pigmentation of labial gingiva ($p<0.001$). No significant association between mother's smoking kretek and children's pigmentation of labial gingiva ($p<0.001$). |
| Nelis et al., 2015 | Periodontitis | Adult males; no description, Indonesia; n=80 | Kretek. No comparator. | No description but differentiates between regular cigarettes and kretek | OR 28.66 (CI not reported) for smoking more than 10 years vs. less than 10 years $p<0.001$ OR 5.174 (CI not reported) for smoking kretek vs. regular cigarettes $p=0.0006$ |
| Kaur et al., 2013, Indonesia | Coated tongue | Adult male University staff; University of Sumatera, Indonesia; n=68 | Kretek vs. regular cigarettes | No description but differentiates between regular cigarettes and kretek | Significant association between kretek vs. regular cigarettes, $p<0.001$ |
| Djokja et al., 2013, Indonesia | Oral mucous lesion | Adult males; local populations, Indonesia; n=692 | Kretek, regular cigarettes and mixed kretek and regular cigarettes | Number of cigarettes consumed daily >1 and duration of smoking >1 year. Differentiates between regular cigarettes, kretek and mixed | Rates of oral mucosa lesion cases by the duration of smoking: 1-10 years $n=7(8.75\%)$, 10-20 years $n=10(12.5\%)$ >20 years of smoking $n=51(63.75\%)$. Rates of oral mucosa lesion by number of cigs smoked daily: <10 cigs $n=11(13.75\%)$, 10-20 cigs $n=44(55\%)$, >20 cigs $n=13(16.25\%)$. Rates of oral mucosa lesions by type of cigarette: regular $n=65(81.25\%)$, kretek $n=0(0\%)$, mixed regular and kretek $n=3(3.375\%)$. |

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|---------------------------------|------------|---|--|--|--|
| Mental health conditions | | | | | |
| Wibowo et al., 2012, Indonesia | Depression | Adult male university students; University of Diponegoro, Indonesia; n=33 | Unspecified cigarettes. No comparator. | No description | No significant correlation between smokers vs. non-smokers, p=1 |
| Peng et al., 2015, Indonesia | Depression | Adult population; Family life survey 2007, Indonesia; n=3061 | Unspecified cigarettes vs. non-smokers | No description | OR 1.79 (CI not reported) for women smokers vs. men smokers. OR 2.875 (CI not reported) for heavy smokers vs. non-smokers |
| Annahri et al., 2013, Indonesia | Insomnia | Young adult male university students; University of Lampung Mangkurat, Indonesia; n=108 | Unspecified cigarettes vs. non-smokers | Number of cigarettes consumed daily >100, daily or occasional smokers. | Significant association between smoking and insomnia (p=0.027) |

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|--|----------------------------------|--|--|---|---|
| Endocrine, nutritional and metabolic disease | | | | | |
| Lestari et al., 2017, Indonesia | Overweight, obesity, underweight | Adult university staff; Jakarta, Indonesia; n=80 | Unspecified cigarettes vs. non-smokers | No description | No significant association between smoking and BMI ($p>0.05$) |
| Khaira et al., 2016, Indonesia | Waist-hip ratio (WHR) | Adult males' fisherman; Padang, Indonesia; n=103 | Kretek with different nicotine content | No description but differentiates between smoking kretek with higher nicotine level vs. lower nicotine level. | Smoking higher nicotine level kretek increased risk of higher WHR (mean 0.9 ± 0.005) as compared to lower nicotine level (<1.1 mg/cigarettes) (0.86 ± 0.05) $p=0.025$ |

Table 2-1 Summaries of health outcome measures

| Study, year, country | Disease | Sample | Type of cigarette and comparator | Definition of exposure | Main results |
|----------------------------------|-------------------------------|---|--|---|---|
| Other diseases | | | | | |
| Tana et al., 2007, Indonesia | Cataracts | Adult local populations; Karawang, Indonesia; n=1223 | Unspecified cigarettes vs. non-smokers | Index Brinkman for the degree of smoking | OR 2.17 (95% CI 1.71-2.75) for smokers vs. non-smokers OR 1.57 (95% CI 1.1-2.2) for heavy smokers vs. non-smoker OR 4.85 (95% CI 2.0-11.7) for heavy smokers vs. light smokers. |
| Prasetya et al., 2015, Indonesia | Hyperpigmentation of the face | Adult male university staff; UNISBA, Indonesia; n=68 | Kretek and regular cigarettes vs. never, former, daily smokers | No description but differentiates between regular cigarettes and kretek | No significant association between smoking daily, smoking less or more than 5 years, ever smoking, and type of cigarettes smoke, p=0.43, p=0.25, p=0.43, and p=0.33, respectively. |
| Noviani et al., 2010, Indonesia | Parkinson's disease | Adult patients; DR Margono, Sidoarjo, Indonesia; n=64 | Unspecified cigarettes vs. Non-smokers | Duration of smoking (0-10 years, 11-20,21-30) | Significant association between smoking and decreased risk of Parkinson's (p=0.0002) |

Table 2-2 Quality assessment of included studies

| MOS case control | Case definition | Representative | Selection of controls | Definition of controls | Comparability | Ascertainment of exposure | Same method of ascertainment of case and controls | Non-response rate | Score /9 |
|---------------------|----------------------------------|----------------|-----------------------|---------------------------|---------------|---------------------------|---|-------------------|-----------|
| Amtha | * | * | * | | * | * | | * | 6 |
| NOS cross-sectional | Representativeness of the sample | Sample | Non-response | Ascertainment of exposure | Comparability | Assessment of the outcome | Statistical test | | Score /10 |
| Wasis | | * | | * | ** | * | * | | 6 |
| Ratnawulan | | | | * | | | * | | 2 |
| Wagiu | | | | * | * | * | * | | 4 |
| Suharmiati | * | | | * | ** | * | * | | 6 |
| Soetiarto | * | | | * | | * | * | | 4 |
| Simamora | | | | | | ** | * | | 3 |
| Siwi | * | | | * | | ** | | | 4 |
| Nelis | | | | * | | ** | * | | 4 |
| Kaur | | | | * | | ** | * | | 3 |
| Djokja | * | * | | * | | * | | | 4 |
| Khaira | | | | * | | ** | * | | 4 |
| Prasetya | | | | * | | ** | * | | 4 |
| Setiadhi | | | | * | | ** | * | | 4 |
| Yashinta | * | | | ** | | ** | * | | 6 |

Table 2-2 Quality assessment of included studies

| MOS case control | Case definition | Representative | Selection of controls | Definition of controls | Comparability | Ascertainment of exposure | Same method of ascertainment of case and controls | Non-response rate | Score /9 |
|------------------|-----------------|----------------|-----------------------|------------------------|---------------|---------------------------|---|-------------------|----------|
| Untari | * | | | ** | | ** | * | | 6 |
| Narayana | | | | * | | ** | | | 3 |
| Santosa | | | | * | | ** | * | | 4 |
| Hikmah | | | | * | | ** | * | | 3 |
| Ramandhika | | | | * | | * | * | | 3 |
| Erawati | | | | * | | ** | * | | 4 |
| Sukmawati | | | | * | | ** | * | | 4 |
| Rizaldy | | | | * | | ** | * | | 4 |
| Putra | | | | * | | ** | * | | 4 |
| Ernawati | * | | | * | | * | * | | 4 |
| Wibowo | | | | * | | ** | * | | 4 |
| Peng | * | * | | * | * | * | * | | 6 |
| Annahri | | | | * | | * | * | | 3 |
| Lestari | | | | * | | ** | * | | 4 |
| Tana | * | * | | * | | ** | * | | 6 |
| Noviani | | | | * | | ** | * | | 4 |
| Syawal | | | | * | | ** | | | 3 |

2.4. Discussion

2.4.1. Main findings

This systematic review identified a relatively limited number of studies, mainly cross-sectional studies of poor quality, but which generally indicated that kretek cigarettes are associated with increased health risks, both compared with not smoking and in some cases, compared with regular cigarette smoking. This study found relatively few studies looking at the health effects for kretek compared to regular cigarettes, most of which were conducted in Indonesia. Studies on the health effects of kretek have looked at a wide range of health outcomes, and most of them showed associations between kretek use and poor health outcomes. Generally, the types of health effects which are associated with kretek use seem to be similar to those for regular cigarettes, such as oral cancer (150), CVD (151), and CHD (153). In addition, study showed decreased risk of Parkinson's disease (178).

2.4.2. Strengths and limitations of the review methods

This is the first systematic review that has reported the health risks of kretek cigarette smoking compared with not smoking or smoking regular cigarettes. The researcher conducted a thorough literature search using help from an expert librarian to ensure a comprehensive and systematic search strategy. This study also included grey literature sources and conducted a focussed search to identify studies conducted in Indonesia, where kretek cigarettes originated and the majority of the world's kretek smokers reside. This study also included studies published in Bahasa Indonesia as well as English to ensure that evidence from Indonesia was captured. This study included non-kretek-specific studies from Indonesia, as these most likely reflect predominantly kretek use, further ensuring that our review is comprehensive. The researcher undertook a comprehensive evaluation of study quality using a well-established quality assessment tool. A limitation of the review is that one reviewer had to translate written studies in Bahasa for two other reviewers. Furthermore, this study may have missed relevant studies written in other languages.

2.4.3. Strengths and limitations of the included studies

The included studies covered a wide range of health effects associated with kretek cigarettes. However, a major limitation in this review was that none of the included studies was of good quality. In particular, the included studies were mostly cross-sectional studies, with small samples that were not representative of the general population. Cross sectional studies measure the prevalence of disease and are thus often called prevalence studies. The measurements of exposure and effect are made at the same time (182, 183). Consequently, it is not easy to access the reason for association shown in cross sectional studies, and it is difficult to conclude anything on harm, risk, or causality due to inappropriate studies being included in this systematic review.

In order to fully understand the health risks of kretek, there is a need for cohort studies and case-control studies, such as to investigate the effect on mortality of light and moderate kretek consumption. Two primary types of observational studies aid in evaluating associations between diseases and exposures (183, 184). Although cohort studies provide the best information about the causation of diseases and the most direct measurement of the risks of developing them, the long period of follow-up required is unfeasible, as such investigation would be very expensive and time-consuming (183).

Furthermore, in all included studies except one, where the method was not described, exposure was self-reported. In general, smokers tend to underreport their smoking and therefore smoking could have been under-reported, and dose-response effects may be underestimated. Future studies on the health effects of kretek should adopt longitudinal study designs, include large representative samples and seek to use biochemical validation.

A further challenge was lack of clarity in the type of cigarette participants smoked; more than half of the studies included did not specify the type of cigarettes used, and were included because they were conducted in Indonesia, where a significant majority of smokers use kretek. However, ten percent of smokers in Indonesia smoke non-kretek cigarettes (185), therefore the observed effects may be partly due to effects of non-kretek cigarettes.

However, our analysis studies which specifically assessed the effect of kretek cigarettes generated similar findings.

Finally, another limitation in this systematic review study is that no study was found that investigated the most common smoking-related diseases, such as of lung cancer, low birth weight and cervical cancer (21, 186, 187). In addition, all these smoking-related diseases are the top-five most prevalent in Indonesia, with around 54,300, 28,940, and 21,605 cases in 2013 (respectively) (88).

2.4.4. Implications

The health risks of kretek cigarettes are not fully understood, and our review demonstrates that good quality longitudinal studies are needed in order to properly identify and quantify the risks associated with kretek use. However, despite the limitations of our review methods and the studies included within the review, our findings indicate that kretek are at least as harmful as regular cigarettes. The paucity of evidence does not prevent the need to minimise kretek use, particularly in Indonesia where its use is extremely common.

Ongoing weaknesses in tobacco control measures in Indonesia are almost certainly contributing to high rates of smoking, particularly among men. Given high rates of use and that they are likely at least as harmful as regular cigarettes, efforts to implement and enforce tobacco control measures in Indonesia should explicitly address kretek use.

The cultural embeddedness of kretek in Indonesian society is likely to make reducing kretek use particularly challenging (188). In order to effectively address kretek use, policymakers require evidence, not just of the health risks that kretek pose, but also attitudes towards and knowledge about kretek within the general population. Existing data suggest that Indonesian people understand that smoking cigarettes cause diseases such as lung cancer and heart disease; however, smoking prevalence is still very high, and the number of smokers is not declining (185). Research is needed to investigate attitudes and health risk perceptions in relation to both kretek and regular cigarettes in the Indonesian population.

2.5. Conclusion

This systematic review has demonstrated that the existing evidence is insufficient to assess the health risks of kretek in detail; to fully understand the harms of kretek high-quality longitudinal studies are needed. However, the existing studies suggest that the habitual use of kretek can increase the risk of a range of health problems, including oral diseases, cardiovascular disease, and respiratory disease. Overall, the current evidence base indicates that kretek cigarettes are at least as dangerous as regular cigarettes, and tobacco control efforts in settings where kretek are commonly used must seek to incorporate measures to reduce kretek use.

CHAPTER 3

QUALITATIVE STUDY OF HEALTH RISK PERCEPTIONS OF INDONESIAN PEOPLE REGARDING KRETEK

3.1. Introduction

The second chapter of this thesis systematically reviews many health hazards associated with smoking regular cigarettes and kretek. Considering the limitation of the study the evidence suggests that kretek has similar risks to regular cigarettes. Furthermore, tentatively, Global Adult Tobacco Survey Indonesia, 2011 (4) showed that four out of five Indonesian citizens believed that smoking cigarettes may cause fatal disease, and that SHS is dangerous (88). Nevertheless, smoking prevalence is still very high, and the number of smokers is not substantively declining (34).

In addition, tobacco smoking not only harms people who smoke but also individuals who are exposed to second-hand smoke (SHS); 6 million people die per year due to direct use of cigarettes, while 890,000 die due to passive smoking (5). Evidence of the negative health effects of smoking cigarettes has been central to driving initiatives to control tobacco use (113).

Smoking in Indonesia is much more common in men, with 6.7% of women, but 66% of men reported to smoke in 2018 (103). Around 90% of all Indonesian smoker's smoke kretek cigarettes (103). Research by Arnez in 2006 suggested that kretek cigarettes have been used for a long time in Indonesia and hold a rich cultural symbolism (89).

The purpose of this qualitative study is to investigate the health risk perceptions of the Indonesian population regarding the use of kretek cigarettes. In particular, the researcher sought to understand perceptions concerning the health risks of kretek cigarettes compared to regular cigarettes and to gain a better understanding of the role of kretek cigarettes in the lives of Indonesian people.

3.2. Methods

3.2.1. Qualitative methodology

Qualitative research involves any research that uses data that does not indicate ordinal value (136). Qualitative researchers are interested in understanding the meanings people have constructed; that is, how people make sense of their world and the experiences they have in it (189, 190).

A qualitative methodology was adopted to investigate the health risk perceptions and attitudes of Indonesian smokers and non-smokers regarding the use of cigarettes. This study adopted a qualitative design for several reasons, including that it is flexible, and allows the in-depth exploration of the attitudes of Indonesian smokers and non-smokers, as well as their experiences and intentions (191, 192). Qualitative research is also able to understand how individuals experience health problems, and reasons for their actions to cope with these problems. This method also could generate a wide range of ideas and opinions that individual carry out about the issue (191, 193). As discussed in the introduction section, this study is considered to be the first qualitative study exploring the health risks perceptions of Indonesian smokers and non-smokers, thus this method fills the gap left by survey-based studies. In conclusion, considering the aims of this study, qualitative interviews were an excellent choice to answer the aims of study, offering more potential for meaningful research contributions than possible alternatives (194).

3.2.2. Epistemological position of the researcher

As discussed in the introduction, in the current study, the researcher adopted pragmatism as a research paradigm. This study used the approach identified as optimal to address the research problem being investigated. The researcher believes that reality is not static, rather it is in a constant state of becoming. The world is changed through actions, and action is pivotal in pragmatism (141). The researcher believes that knowledge is always based on experiences. One's perceptions of the world influence their social experiences. Each person's knowledge is unique, as it is created by their unique experiences and knowledge, and it is co-created in a socially shared context, from social experiences (141). In pragmatism the object is judged by

utility; a piece of knowledge is valued in terms of whether it is useful for a given interest, in contrast with positivism, where the object is what it is (on its own objective terms), or constructivism, where it is judged according to its societal implications. For instance, a hammer for a pragmatist researcher is useful of striking nails; an antibiotic is useful for dealing with bacterial infections; and a bench is something that can be sat on (139, 143, 195).

Knowledge is to be evaluated according to whether it has useful consequences for the user's desired action. The criterion of usefulness is then tempered by the critical analysis of which interests are being served by that action (195).

3.2.3. Data collection

A 2333sdx qualitative methodology using one-to-one telephone interviews was adopted. This study was conducted with two different groups of participants: current smokers and non-smokers who have family members or friends who are smokers. All interviews were conducted in Indonesian language (Bahasa Indonesia) native language for interviewee.

3.2.4. Sampling participants

Purposive sampling strategies were employed to obtain a diverse study population. Purposive sampling aims to achieve maximum variation in sampling (with varying outcomes from participants' perspectives). This study included participants with different smoking status, sex, and age. In the selection of participants this study considered characteristics pertinent to address research issues, which was reflected in the sample. Participant recruitment was conducted in municipal offices where people with various backgrounds (i.e. socio-economic factors) come to do official paperwork, such as obtaining civil identity documents, and birth and death certificates. Permission for data collection was obtained from the municipal offices in Jakarta, Bandung, and Bekasi (aside from participants themselves). Jakarta, the capital city, is inhabited by hundreds of different ethnic groups from throughout the Indonesian Archipelago (196). Bekasi and Bandung are located in the province with the most tobacco users (32.7% of the population aged over 10 years) (34). All Indonesian smokers and non-smokers from these

three municipal offices who were aged 17 years and above were eligible to participate in this study.

3.2.5. Recruitment procedure

The researcher approached potential participants when they were leaving the municipal office and briefly explained the research background, methods being used, and the benefits of participating in the study. The potential participants were given a study information sheet (Appendix 9) and if they were willing to participate, the researcher recorded their basic information (name, age, sex, telephone number, and smoking status) on a paper form. On the same day, this information was transferred to a password-protected computer and the paper form was destroyed. The researcher asked participants for their preferred time in the next few days for the researcher to call them by phone to undertake the interview.

Participants who agreed to be contacted were required to provide written consent (Appendix 8). They were assured that all information collected, and opinions expressed would be anonymized when reporting the study's results.

The researcher aimed to recruit 60 participants, 20 in each town. Some experts agree that data saturation is the optimal criterion to define the sample size, while other authors provide numerical advice. According to Braun's grounded theory, qualitative studies should generally include between 20 and 30 interviews (189, 197, 198). The researcher therefore aimed to recruit 20 in each town, this study purposively sampled participants based on smoking status (smokers and non-smokers) according to the objectives of the study.

As an incentive to take part in the study, participants received a mobile phone voucher worth 160,000 IDR (around 10 GBP), which was sent directly to their mobile phone after they completed the interview.

3.2.6. Data collection

Interviews followed a semi-structured, open-ended one-to-one approach. This method was selected over other approaches such as focus groups for generating qualitative research results, on the basis that participants may be

more willing to share their experiences and perspectives through individual interviews. Phone interviews enable access to populations which are difficult to reach (e.g. shift workers and disabled people) and more flexibility in the timing of data collection (199).

3.2.7. Conceptual framework for interview guide

Semi-structured interview is less controlled than structured interviews and is thus more flexible. All interviews were based on a semi-structured interview guide, including both closed and open questions, prepared in advance by the interviewer. However, in the course of the interview, the interviewer has a certain amount of room to adjust the sequence of the questions to be asked and to add questions based on the context of the participants' responses. In this study, semi-structured interviews were chosen as a data collection tool because they permit participants to express their views about the health risks of cigarettes smoking in Indonesia using their own words, while the interviewer can listen and observe with care and sensitivity (200).

Questionnaires from similar studies (126, 201) were used as guidelines to develop the interview guide used in this study. Interviews with smokers covered the use of kretek and regular cigarettes; attitudes and beliefs about them; the perceptions of risks and benefits of kretek cigarettes compared to regular cigarettes; and smokers' attempts to quit (Appendix 6). Interviews with non-smokers included concerns about the use of kretek cigarettes by family members or friends; and perceptions of the health risks or benefits associated with passive exposure to kretek smoke (Appendix 7). The interview guides as well as other research documents, such as consent forms (Appendix 8) and information sheets (Appendix 9), were drafted in English and then translated into the local language (Bahasa Indonesia).

Pilot interviews were performed with six Indonesian current smoker and non-smoker volunteers who were contacts known to the researcher. The pilot study ensured that the communication by phone was feasible, and questions were easy to understand; some questions were refined based on this pilot study.

All interviews were conducted by telephone and were audio recorded. At the beginning of the interview, the researcher reconfirmed each participant's willingness to participate in the study and obtained their verbal consent. Interviews were conducted between July and August 2017, with each one lasting 25 to 30 minutes.

3.2.8. Analysis and interpretation

After data collection, each interview was transcribed verbatim in MS Word and each transcription was labelled with an identity number. No personal details were stored with the research data and only the researcher knew participants' identities. In addition, the researcher went through all transcripts and removed any information that could identify participants. Afterwards, transcripts were translated into English and the English MS Word files were transferred to NVivo 11 qualitative data analysis software for coding purposes.

3.2.8.1. An overview of the thematic analysis approach

A thematic analysis was used to analyse, identify, and report patterns of themes within the data. Although the thematic analysis had some limitations there were several benefits of using this type of analysis, which are discussed in more detail in the discussion section of the thesis.

Thematic analysis is a foundation of qualitative analysis methods, and it provides core skills for conducting qualitative analysis needed by the researcher, especially as an early career researcher.

Thematic analysis is considered a flexible method, which means that it can be used with any theoretical framework or epistemological position, or it can be independent of theory and epistemology, thus potentially providing rich and detailed data (197).

Theme

A theme captures something important about the data in relation to the research question and represent some level of patterned response or meaning within the data set.

The analysis was based on the methods of Braun and Clarke's guidelines (197); the steps of analysis are as follows:

Step 1: Familiarisation with the data

Familiarization began with transcribing the interviews and translating them from Indonesian language into English. Each transcript was read carefully several times to get a clear understanding of the data and to become familiar with it.

The researcher then created a mind map of the potential codes and themes. All these data were stored in NVivo 11 software, which also helped in sorting and organizing the data.

Step 2: Generation of initial codes

Following step 1, the lead researcher organized data into meaningful groups (systematically coding interesting features across the data set, collating data relevant to each code). Coding was done by tagging and naming selected parts of text within each data item: the researcher coded as many potential patterns and kept as much surrounding data as possible, so that individual data could be coded into different themes. For quality control purposes, all interviews were coded by the lead researcher, and 20% (12 interviews) were selected randomly and allocated to the research supervisors for double coding.

Step 3: Searching for themes

In this phase the researcher identified themes. Themes represent patterns within the data set - they capture important groups of codes that are related to the research questions. The researcher let themes emerge from the data rather than identifying them according to any pre-existing theories or coding frames.

Our steps for searching the themes were as follows: First, the researcher grouped codes into categories (or themes). Then, interrelated themes and categories were combined in smaller sets of themes (collating codes into potential themes) and the researcher examined the codes within each theme

to identify whether there were subthemes within each theme. Finally, the researcher coded all data extracted using the themes and subthemes, adding to these if new themes or subthemes emerged from the data. The researcher presented these potential themes and subthemes and coding of all data extracted in a table. Several meetings were held throughout the coding process to look for new themes based on a deeper understanding of the data. Minutes of meetings were documented to keep track of emerging impressions of the meaning of data and how codes related to each other; these activities contributed to ensuring the reliability of our study.

Step 4: Reviewing themes and subthemes

The researcher reviewed the table of themes and subthemes against the coded data to ensure the validity of different themes in relation to the data set and that the themes and subthemes were coherent and meaningful.

Step 5: Naming and defining themes

After reviewing all themes and subthemes, the researcher named themes based on their essential meaning, identifying what they were about and what was covered by these themes. In this phase, the researcher also summarized the scope and contents of each theme and subtheme by preparing a table to summarise each theme and the definition of each theme.

Step 6: Producing the report

The researcher synthesised the themes and subthemes, and quotes related to them. During the writing up process the researcher assessed how the research questions were answered, compared findings with literature as well as reflecting on the personal meaning of findings.

3.3. Results

A total of 20 participants were invited from the Pulo gebang Municipal office in Jakarta, 20 from the Mustika Jaya Municipal Office in Bekasi and 20 from the Lebak Dago Municipal office in Bandung. The researcher recruited 60 participants and a total of 58 participants participated in the research. 2 participants were not able to be contacted. The 58 participants included 31

male smokers, 7 male ex-smokers, 12 male non-smokers, 4 female non-smokers, 1 female ex-smoker and 3 female smokers (Table 3-1). From the study, seven themes were identified. These are summarised in **Error! Reference source not found.**

Table 3-1 Participant characteristics

| | Smoker | Ex-smoker | Non-smoker |
|-----------------------|--------|-----------|------------|
| Male | 31 | 7 | 12 |
| Female | 3 | 1 | 4 |
| Age range (years old) | 19-75 | 29-47 | 18-69 |

Table 3-2 Themes and subthemes occurrence among participants

| Themes | Definition | Subtheme |
|---|--|---|
| Patterns of smoking behaviour | This theme reflects patterns of smoking behaviour: why (reasons for Indonesian smokers to take up cigarettes), who (gender and age). | None |
| Influence on the choice between kretek, other tobacco products and regular cigarettes | This theme covers views about different types of tobacco products and why smokers choose certain type of cigarettes. | None |
| Perceived benefits of smoking | This theme reflects the perceived benefits of tobacco use. | None |
| Awareness of health effects | This theme covers smokers' and non-smokers' views about the health effects of smoking. | Awareness of health risks of active smoking Perceptions of environmental tobacco smoke Concerns for health of young people Perceptions about type of cigarettes and health |
| Women's attitudes to smoking | This theme reflects the attitudes of women towards the use of cigarettes by men or by themselves. | None |
| Experiences of trying to quit | This theme reflects smokers' and ex-smokers' experiences of attempting to stop smoking | Reasons for trying to quit Methods of trying to quit Difficulties in trying to quit Misconceptions about the health risks of quitting smoking Physicians' role in helping smokers to quit |
| Important of religion in smoking behaviour | This theme reflects aspects connected to religion and initiation, maintenance of participants' smoking behaviour. | None |

3.3.1. Patterns of smoking behaviour

Many factors affected participants' initiation and maintenance of their smoking behaviours. Most participants started smoking when they were teenagers. The reasons that motivated participant smokers to start smoking were varied; for

some it was to be accepted by friends or to avoid peer group disapproval or rejection.

My first smoking experience ... err ... because of my after-school courses, most of my friends were smokers, at the beginning I tried to smoke cigarettes because that day, I was so curious on how to smoke cigarettes ... I asked my friend to give me a cigarette, the day after I asked again for more and then I started buying cigarettes until now. (19 years old, male, smoker)

I was only following my friends, because I didn't want to feel left out, so I started to smoke cigarettes (40 years old, male, smoker)

I pretended to be a smoker, I carried cigarettes everywhere, but when everyone was smoking cigarettes, I ate candy <Laugh>. (32 years old, male, smoker)

Some participants talked about smoking as being initially part of their “social together/hangout” activities. Before they became regular smokers, participants said they tended to smoke cigarettes in a group, and they enjoyed sharing cigarettes or getting cigarettes from a “bossy” friend. When they started smoking, they often did not smoke at all when they were alone.

I don't smoke cigarettes except if I go out with my friends (19 years old, male, smoker)

Smoking by family members played a role in the smoking initiation of teenagers; in this study, many participants recalled that they got their first cigarettes from their fathers, their friend's mother or their brothers.

I've smoked cigarettes since I was a student, I smoked Djarum Super because I saw it on the table when my father put them there ... I stole his cigarettes, one cigarette daily. (53 years old, female, smoker)

3.3.2. Influence on the choice between kretek and other tobacco products and regular cigarettes

Smokers described their choice of cigarette type which had often changed over time. Many also said that the longer people smoke the more they tend to choose kretek cigarettes. Participants described kretek cigarettes as being preferred by people who had more experience of smoking, and often by older people, because only kretek were available in their teenage years. On the other hand, participants felt that young people choose regular cigarettes because they are more stylish.

I think if the smokers get more experience, they will more likely take up more firmly packed cigarettes, first they smoked regular cigarettes, then changed to filter kretek then kretek without filter. (19 years old, male, smoker)

In the past, the variation of cigarettes was not as much as today, there were not U mild ... Marlboro (regular cigarettes brands) ... before, the only available were Djingo, Samsoe, Sampoerna (all kretek cigarettes) ... filter kretek was not available as well ... so there were not any much choices. Super ... well ... super only Djarum super (kretek) at that time ... (38 years old, male, smoker)

I think a regular cigarette is more for lifestyle, young men or women usually smoke that type of cigarettes, kretek cigarettes is more for people who have experienced in smoking cigarettes, so they can appreciate the taste of cigarettes, or maybe old people that already chose kretek because of difficulties in getting regular cigarettes previously. (40 years old, male, non-smoker)

... For me a regular cigarette is more like for a style, smoking regular cigarettes will look more impressive (38 years old, male, smoker)

Most participants reported choosing their cigarette based on taste (sweet, bitter, warm smoke, cold smoke) and “kepuasan” (satisfying feeling) that they get from smoking cigarettes.

Smokers described differences between the experiences of smoking kretek and regular cigarettes and how this affected their enjoyment. Regular cigarettes contain tobacco that is finer cut and easier to burn, while kretek mostly contain “kasar” (cut rag, shredded tobacco). Because of their rough tobacco cut, kretek cigarettes have to be firmly packed and are thus more difficult to inhale. Participants described how inhaling kretek was similar to inhaling a hose that has the tip in water; they described this as “rasa puas” (satisfying smoking) because they can inhale very deeply. Furthermore, because kretek cigarettes are firmly packed, participants said it takes longer to smoke kretek cigarettes.

I choose “Djarum super” (kretek) ... well ... different (variation of cigarettes) people have different taste bud ... I feel like “Djarum Super” taste sweet. (38 years old, male, smoker)

Kretek is like ... if we smoke it ... feels very heavy ... it is delicious ... for us as a smoker, it feels really satisfying (43 years old, male, smoker)

They are different (regular cigarette and kretek) ... if I smoke kretek cigarette usually one cigarette is equal to three regular cigarettes. (38 years old, male, smoker)

Participants also perceived geographical differences in product choice, such that kretek cigarettes are used in cold non-urban areas, while in urban areas regular cigarettes are more common.

Kretek is usually consumed by smokers who go to cold (freezing) areas, such as if we go to the mountains smoking kretek cigarette makes our body warm, while smokers who live in the cities, they usually smoke regular cigarettes, the ones that have less aroma. (45 years old, male ex-smoker)

3.3.3. Perceived benefits of smoking

Smokers talked about their perceptions of the benefits of cigarette smoking, including many social benefits.

Like ... when I talked to my girlfriend ... when I was single ... if I smoke cigarette ... I have self-confidence, when I share my feeling with her meanwhile, I smoke cigarette ... It has just felt right. (38 years old, male smoker)

I remembered when I was starting to smoke cigarette, I feel like macho, look cool and impressive too. (50 years old, male, smoker)

Smokers also talked about their sense of “need” to smoke cigarettes:

I think cigarettes give me satisfaction ... smoking a cigarette is more like a need, I smoke a cigarette every time I need them, I want them. (52 years old, male smoker)

Smoking cigarettes is meeting my needs, it is better not to eat than not to smoke (43 years old, male, smoker)

3.3.4. Awareness of health effects

3.3.4.1. Awareness of health risks of active smoking

Most smokers said that when they began to smoke cigarettes, they never thought about the health risks; most of these individuals were now may think about the health risk but do not have a clear understanding of the health risks.

At first, I never thought about negative effect of smoking cigarettes nor the benefits, I started to smoke cigarettes because of my friend's mam, my friends smoking cigarettes and I followed them ... Now I think about the negative effects of smoking, is it true that smoking cigarettes caused diseases or not? (47 years old, male, smoker)

Most participants were aware that smoking cigarettes causes coughs and shortness of breath, but few smokers believed that smoking cigarettes causes serious illness such as cancer and lung disease; the majority of participants believed that the dangers of cigarettes were only propaganda or a slogan from the government.

Well, the dangers of cigarettes are maybe only a propaganda from the government, like we saw on the television, it can cause disease in lungs or anything like that. <Laugh>. (42 years old, male, smoker)

... I think of the cigarette danger as a slogan only, I really do not believe them ... if smoking is dangerous or not, like causing a disease like err ... throat cancer ... (43 years old, male, smoker)

Ex-smokers believed that smoking could cause many fatal diseases and many ex-smokers had been diagnosed with a smoking-related disease. However, not all participants diagnosed with a smoking-related disease had quit smoking.

From my experience, I get heart disease and so on, this is because of 15 years of smoking cigarettes. (30 years old, male, ex-smoker)

... I was diagnosed with heart disease by a doctor, but I still cannot stop smoking cigarettes ... (52 years old, male, smoker)

3.3.4.2. Perceptions of environmental tobacco smoke

When talking about exposure to cigarette smoke, some participants perceived that the health risks of environmental tobacco smoke are higher for non-smokers than for active smokers.

... For people surrounding the smokers. As far as I know ... passive smokers will get the disease more than a smoker themselves. (23 years old, male, smoker)

Oh ... the smoke from smoker's cigarettes, passive smokers can get more negative effects like lung diseases and respiratory diseases. (29 years old, male, smoker)

3.3.4.3. Concern for health of the young people

There were mixed opinions regarding the risks of second-hand smoke to children and young people. Most smokers said they would smoke even if they knew that there were children around.

Well, I don't know yet about the effect of cigarette smoke on the children, so we don't have to worry, the most important thing is if we smoke cigarettes, we enjoy the cigarettes. (35 years old, smoker, male).

When I smoke cigarettes, I am always aware of people surrounding me, if there are children and mothers, I move some distance away from them then smoke the cigarettes, but, I am aware that my smoker friends don't care, they just don't care. (23 years old, male, smoker)

3.3.4.4. Perceptions about the type of cigarette and health

There were mixed perceptions about the relative health risks of kretek and regular cigarettes. Most participants described kretek cigarettes as herbal and therefore less toxic.

... But if we talk about tobacco and regular cigarettes ... there are differences ... kretek is like pure tobacco and added clove, but regular cigarettes are like a paper, for example Marlboro and other regular cigarettes' brand, they have tobacco, but they have harder paper, so regular cigarettes are more dangerous, because they have more chemicals. (22 years old, male, smoker)

Smokers also mentioned the tar content in regular cigarettes. They believed that the tar in regular cigarettes is more dangerous compared to the tar in kretek cigarettes, even though regular cigarettes are lighter to inhale.

Regular cigarettes are more dangerous than kretek cigarettes, even though if the smoker inhales the cigarettes feels lighter and the smoke is less, but the tar is more dangerous, because I have read about the dangers of tar and chemical ingredients in the regular cigarette, tobacco cigarette is more destructive and has more negative effects in health like mouth cancer and may other diseases (29 years old, male, smoker)

Older smoker participants suggested that daun kawung cigarettes (tobacco hand-rolled, wrapped in dried sugar palm leaves) are less dangerous to health compared to regular cigarettes.

I use daun kawung to wrap the tobacco ... Well, because daun kawung roll up cigarettes are a natural product mam, it's purely daun kawung, by contrast, the cigarette companies put chemical ingredients in the cigarette's mam. (63 years old, male, smoker)

The quotes below describe participants' perception that filter cigarettes are safer compared to non-filter cigarettes.

I smoke filter cigarette only; I can't breathe properly if I consume non-filter cigarette. I often get a cough. (30 years old, male, smoker)

Regular cigarette has a filter so the smoke (cigarette smoke) will not get into the lung straightaway (42 female non-smoker)

Kretek cigarettes non-filter is more dangerous than regular cigarettes because they don't have any filter, so the smoke will get straight to our lung (52 years old, male, smoker)

3.3.5. Women's attitudes to smoking

The majority of female non-smoker participants did not want their husband and family to smoke cigarettes; this was influenced by several perceived factors, including their awareness of the risks associated with smoking and second-hand smoke.

... I tried to convince him (her husband) to stop smoking, the cigarette is not healthy, especially for us as a passive smoker, I am afraid we can get cancer disease ... we discussed about that before. But he still smokes cigarettes (42 years old, female, non-smoker)

With regard to parental smoking, all female and non-smoker participants thought that parents should worry about exposing their children to cigarette smoke.

Yes, I have, in the past we talked about his smoking cigarettes behaviour ... err ... my husband never smokes inside the house, he smokes cigarettes outdoors, because we have children, and I am a non-smoker. (48 years old, female, non-smoker)

Young women or daughters were reported as drivers of keeping the home smoke-free, for example, asking their smoking father to smoke outdoors.

Both my daughters ... they asked me to smoke outdoors ... I always smoke outdoors now ... it is far away from the house, not on the porch ... because my daughters do not like the smell of cigarettes smoke ... so after I smoke a cigarette I will eat something to remove my bad breath ... (52 years old, male, smoker)

Most male smoker and non-smoker participants said that smoking cigarettes is almost exclusively done by Indonesian males, and they felt it inappropriate for women to smoke cigarettes. They held strong negative stereotypes about women who smoked. Similarly, for female smokers, smoking cigarettes was not socially acceptable; they reported feeling uncomfortable about smoking cigarettes and tended to hide from their family, due to the stigma of smoking as a woman.

... They (women smokers) feel uncomfortable if their family finds out about their smoking behaviour because they are

women. Stigmatised, they still feel like women are not supposed to smoke cigarettes ... (49 years old, female, non-smoker)

... People will mock me up because I am a smoker girl, so I need to choose a place where I smoke cigarettes, I am not smoking in front of children and mothers, well, especially mothers, because when they saw me smoking cigarettes; I feel like, they were staring at me, and it made me feel uncomfortable. (23 years old, female, smoker)

Similar to male smokers, factors affecting the initiation of female smokers include peer influence. Most participants described the reason that women smoke as to help them cope with stress.

... I visited my friend's house and her mother was a smoker, at that time she was not at home, so we stole her cigarettes, we were very curious, we tried smoking the cigarettes at that time. (23 years old, female, smoker)

... but for her (his wife) ... if she was stressed. Maybe she thinks smoking can make her more relaxed. To calm her mind if she was stressed. (40 years old, male, non-smoker)

3.3.6. Reasons to quit and experiences of trying to quit

3.3.6.1. Reasons for trying to quit

Most smokers in this study indicated that they did not have plans to stop smoking soon.

Among ex-smokers and people who intended to quit smoking, the reasons for trying to do it were often the cost of cigarettes.

Participants suggested that price increases would make smokers quit, but that some would switch to other cheaper cigarette brands or decrease their tobacco consumption.

... I think if the cigarette price reaches 50 K IDR (2.5 GBP) then I will stop smoking cigarettes, in sequence, first, I have to

decrease my consumption, then I will quit smoking cigarettes at the end ... (44 years old, male, smoker)

If the price of cigarette gets higher then I will decrease my consumption, so it's just dependant on my budget. (52 years old, male, smoker)

I think because I like smoking cigarettes, I do not have any problem buying cigarettes, like for example if the price of cigarettes is getting higher, maybe I will buy a cheaper cigarette brand, so If I cannot buy my favourite cigarette I will change to a cheaper cigarette. (18 years old, male, smoker)

Some participants indicated that price increases would encourage a switch to e-cigarettes.

If the price of cigarette is increasing, I will change to vaporizer, vape is expensive only at the beginning because I have to buy the gadget, but after that, I only need to buy refill that is cheaper than buying regular cigarettes. (47 years old, male, smoker)

3.3.6.2. Methods of trying to quit

Most ex-smokers indicated that they stopped smoking straight away, without cutting down first.

Just stop. Just like that. I didn't decrease my cigarette consumption. I did not eat any candies to help me stop smoking. (30 years old, male, ex-smoker)

An ex-smoker reported that his friends were using traditional medicines to help them quit.

Some of my friends who quit smoking cigarettes, they used herbal medicines to help them during their quit attempt. (45 years old, male, ex-smoker)

Almost all ex-smokers referred to eating candy and snacking to support their quit attempt.

I stopped smoking cigarettes by eating candy, any kinds of candy, while I was in the process of quitting smoking cigarettes, every time my friends smoked cigarettes near me and when they offered me a cigarette, I got confused and dizzy, so I ate candy to prevent me from smoking cigarettes again, it was during first three months of my quit attempt. (29 years old, male, ex-smoker)

Some talked about switching to e-cigarettes.

I was smoking regular cigarettes then changed to vape. But then I stopped the vape ... and finally, I stopped smoking altogether. I stopped being an "Al hisab" (a term used in Indonesia to state that a person is an expert in smoking) population (being a smoker) <laugh ... >. (30 years old, male, ex-smoker)

3.3.6.3. Difficulties in trying to quit

Participants reported some difficulties in trying to stop smoking. Some reported a bad taste if they did not smoke a cigarette after a meal. Some people reported that they feel faint, emotionally unstable, that their mouth feels unpleasantly sour and or that it gave them a headache.

It is difficult to stop smoking because I am already addicted to smoking cigarettes, especially when I finished eating my meals, I eat sweet and spicy foods, so I need to smoke a cigarette to get rid of the sweet and spicy taste remaining in my mouth, (40 years old, male, smoker)

Most participants perceived addiction to be the main barrier to stopping smoking.

I still continue smoking cigarettes because I already addicted (75 years old, male, smoker)

Addictive, mam, sometimes if we do not smoke cigarettes, our mouth taste sour so even though we know the health effect of smoking cigarettes, but we still smoke cigarettes (23 years old, male, smoker)

3.3.6.4. *Misconceptions about health risks of stopping smoking*

There were some misconceptions about the health effects of quitting smoking.

I haven't had any negative effects (of smoking cigarettes) to my health, thank God. In fact, my friend who stopped smoking, he died a week after quitting smoking ... I think he stopped smoking in the wrong way. (28 years old, male, smoker)

I will reduce my consumption 1 or 2 cigarette in a day because it is very difficult to stop smoking, it is just like drug addiction ... from what I saw on the television, if they stopped smoking totally they get sick. (30 years old, male, smoker)

If I stop smoking suddenly then I will waste my antibody (the participant believed that he would gain immunity from smoking-related diseases if he continued to smoke) that I have gained from smoking cigarettes, if I stop smoking I become ill and have body aches. (43 years old, male, smoker)

3.3.6.5. *Physicians' role in helping smokers to quit*

Several participants described their experiences in relation to visiting doctors and smoking. Some were told by their doctors that they should quit smoking cigarettes; and some suggested that doctors were not insistent on their patients quitting permanently or were smokers themselves.

My doctor advised me to stop smoking because I have asthma, but I still insist on smoking cigarettes, I can't stop smoking cigarettes, mam. (44 years old, male, smoker)

The doctor only said that I had to stop smoking for a while, if I feel fine then I can smoke a cigarette again. (63 years old, male, smoker)

I was visiting a doctor, and the doctor was smoking ... I asked the doctor "Why do you smoke cigarettes? The doctor said ... well it doesn't matter, I smoke a little bit of cigarettes only ... that what he said (52 years old, male, smoker)

One of my friends, she is a doctor, and she is also a smoker. She smokes Marlboro Ice cigarettes. (49 years old, female, non-smoker)

3.3.7. Important of religion in smoking behaviour

Religion is something smokers mentioned as an important contributor to the initiation and maintenance of their smoking behaviour. Smokers believed that religion was a way of counteracting the harmful effects of smoking i.e. God will decide when I go.

No, I don't believe that smoking cigarettes cause smoking-related diseases, I believe that's only a myth, well, only God knows when we have a disease, if I get sick then no problem but if I am healthy I thank God for it. (male, 43 years old, smoker)

I never thought about the smoking-related disease, it's just "Allahualam" (only God decides what will happen). If Allah said I will get sick, then I will, it's not because of smoking cigarettes that we get a heart attack or lung problems" (18 years old, male, smoker)

Smoking cigarettes was said to help young men have good voice for reading al-Quran (the holy book of Muslims).

I remember one day, my friends suggested to me to smoke cigarettes if I want my voice to sound good in reading al-Quran,

*so that's the reason why I took up cigarettes in the first place.
(male, 19 years old, smoker)*

One smoker participant linked smoking cigarettes with the movement made during prayer.

Disease (smoking-related diseases) come from our mind, ... we must be relaxed when smoking cigarettes. Smoking in a rush for me is wrong. Smoking cigarettes is like praying, we should relax doing all praying movements (prostration and bowing movements), similar with smoking cigarettes. (28 years old, male, smoker)

Nevertheless, some religious activity such as fasting was said to support abstinence or changes in smoking behaviour.

In Ramadhan (the ninth month of Islamic calendar and is observed for Muslim worldwide as a month of Sawm/fasting), my family, especially my children get upset if I smoke cigarettes at home, so I smoke cigarettes outside the house. (45 years old, male, smoker)

Many participants who were non-smokers believed that smoking cigarettes is prohibited by their religion because their religion prohibits people from doing unnecessary or harmful activities.

I don't think we are allowed to smoke cigarettes according to our religion because our religion prohibits people doing useless activity, and even more activity that could make them perish. (40 years old, male, non-smoker)

Many participants indicated that they would quit smoking if the Indonesian council of Ulama (MUI) announced that smoking cigarettes activity is haram (prohibited).

I think all up to me (to quit smoking cigarettes), I will make my own decision, if I think I will stop smoking because our religion,

like for example smoking cigarettes is haram according to MUI then I will stop smoking cigarettes. (43 years old, male, smoker)

3.4. Discussion

This is the first study to investigate Indonesian smokers' and non-smokers' health risk perceptions associated with the use of cigarettes and provides a distinctive insight into the complexity of smoking behaviour in Indonesia. The study showed that reasons for initiation and difficulties in quitting smoking cigarettes are similar to those in other contexts, but several issues are specific to the Indonesian context. In particular, there are strong cultural and religious influences upon smoking and what is smoked. Kretek is most commonly being smoked by older more established smokers, and regular and manufactured kretek cigarettes by the young, being seen as modern and fashionable. There is a marked contrast between men and women, with a sense from men that it boosts their confidence with women, whilst women do not want men to smoke cigarettes. There was inconsistent understanding of the harms of cigarette smoke, with greater awareness of risks, including that of passive smoke exposure, expressed by women compared to men. Inadequate understanding of the risks of smoking and benefits of quitting, as well as the lack of support for stopping smoking are major concerns.

3.4.1. Culture and fashion influence choice of kretek versus regular cigarettes

Kretek cigarettes are an indigenous product. And many people, especially older smokers, say they prefer kretek cigarettes over regular cigarettes, because of their fuller taste and different aroma; Some companies that produce kretek cigarettes add 'sauce' to clove cigarettes to get a unique flavour, thus giving them a competitive advantage over other companies (89). However, it is probably also because this was the only cigarette available in the past.

Indonesian have differing taste and preferences not only in the food they eat, but also in the kinds of flavours they enjoy in their cigarettes. Some people choose cigarette with a sweet taste, while other might wanted to have spicy

taste to their cigarette. people described kretek cigarettes such as Djarum Super as having sweet taste, while other people choose Gudang garam because of their spicy cinnamon flavour. Indonesian people have tendency to add flavours to about every food that they eat, like sambal (chili paste) in every food, or put some crackers on every bowl of served soup. Flavoured cigarettes also intends to create a unique taste based on Indonesian taste buds (80) In line with the development of food industry in Indonesia, cigarette flavours also vary from time to time (80).

While older smokers choose kretek cigarettes because of their taste, young smokers consider regular and manufactured kretek cigarettes as more stylish. Kretek industries managed to get along with the changes in Indonesian society by recreating manufacture kretek cigarette that have appearances like regular cigarettes (89). Machine made Kretek cigarettes launched in 1974. The kretek cigarettes machine (SKM) was a booming product in the history of the kretek industry. These types of cigarettes are filtered cigarettes that have similar appearance to western cigarettes; similar in the shape, size and colour in each cigarette (80).

Indonesia is the only South East Asian country that still airs cigarette advertisements on the television (126).The cigarette companies promote their products through television, radio and public media (posters, banners and billboards).

In Indonesia, big tobacco companies spent trillions of rupiahs on tobacco advertisement, promotion, and sponsorships. They used traditions, modernity and globalization themes to advertise their cigarettes products (126). This influences the vies of Indonesian adult smokers, as they describe smoking as a “cultural” activity using positive social terms. Advertising agencies also promote kretek cigarettes as a lifestyle product. With a wide range of packaging and flavours to appeal to young people (126).

The effects of creating new flavours and appearances of cigarettes to be more stylish and the advertising on tobacco use are concerning. It suggests that big tobacco companies are hijacking the industry to produce a product that they

are directly aiming at Indonesian smokers in all age groups (94). This is very worrying, because there are still a lot of confusion and misperceptions about the health effects of cigarette among Indonesian society. This fact leads to a potential of smoking epidemic.

3.4.2. Strong gender differences in attitudes to smoking

Gender differences seen in this study are in line with data from existing studies; smoking rates are generally lower in women at the start of smoking epidemics (202). The findings in this study suggest that one of the reasons why men dominated smoking cigarettes was because smoking for women appears to be culturally inappropriate in Indonesia (100).

Men perceive smoking as having social benefits, such as attracting women and as a social construction of masculinity. These perceived benefits of cigarettes, particularly to men, encourage smokers to initiate or continue their smoking behaviour. These findings may be explained by the fact that tobacco advertisements are still mostly directed at men (89, 125). Values pictured by tobacco company cigarette promotion include modernity, friendships, masculinity, and glamour (126).

Women, on the other hand, seem aware of the health effects of smoking and want men to stop smoking. This finding suggests that it is important to act to empower women at all levels, including the political and technical fields, to enable the necessary advocacy and scientific skills required to monitor and control the tobacco epidemic in Indonesia.

The increased of numbers of female smokers in the United States in the late 1960s was associated with introduction of brands targeted to young women at that time (202). It is very important to prevent tobacco companies from starting to target women and to put measures in place to ensure that more women do not take up smoking.

3.4.2.1. Need for population level education on health risks

Male smokers underestimated the risks of smoking; they believed that smoking causes cough and sore throat but seemed to deny that cigarette

smoking could cause fatal diseases, such as lung cancer and heart disease. This could be happening because people construct arguments to deny the level of risk and to justify continuing their smoking behaviour (203). Our findings reveal that smokers do not recognize their own vulnerability.

This study was particularly interested in whether smokers choice of cigarette reflects their perception of health risks; people had mixed perceptions regarding the health risks of smoking kretek cigarettes versus regular cigarettes, and this did not seem to be an important reason for their choice of cigarette. Findings of a systematic review study (Chapter 2) demonstrate that kretek cigarettes are likely to have similar health risks to regular cigarettes.

The prevention and cessation among the Indonesian population require a series of measures, including public information and school health education (204). Several existing examples of effective action particularly in developed countries can be drawn upon to ensure this. However, there is a need to adapt these approaches to make them appropriate to the specific Indonesia situation.

3.4.3. The lack of support for quitting smoking

This study observed that no ex-smoker received help from health professionals through their process to stop smoking. Furthermore, participants reported that they still found physicians smoking cigarettes. Since doctors and other health professionals are crucial to providing advice to smokers, it is important that they should be helped to stop smoking and encouraged to advise and support smoking cessation for their patients (54). Most ex-smokers used more regular ways of stopping smoking such as going cold turkey, eating candy, using herbal medicines and engaging in religious activity (fasting). However, there is no evidence that these methods are effective in supporting quit attempts (205). It was of interest that e-cigarettes have emerged and may help with cessation as seen in other populations.

The predominant religion in Indonesia is Islam (followed by 87% of citizens) (206), and the findings suggest that religion could have an important role in smoking behaviours and in quitting. The Indonesian Council on Religion

(Majlis Ulama Indonesia/ MUI) has issued a fatwa (Islamic legal verdict) stating that smoking by pregnant women and children is haram (prohibited) and that smoking by men and non-pregnant women is makruh (discouraged) (127). Muhammadiyah, one of the two dominant religious organisations, which represents 30 percent of all Indonesian Muslims, has declared that smoking cigarettes is haram for all of its followers, citing the Quran's prohibition on engaging in useless activities that can lead to death (207). MUI and Muhammadiyah's fatwas on smoking are likely to have prevented some non-smokers from initiating smoking behaviours (127). In contrast, Nahdatul Ulama, the largest Muslim organization representing 60% of Indonesian Muslims, has some involvement in the cigarette industries (208), and permits the use of cigarettes in traditional Islamic schools, which are mostly located in Java. Nahdatul Ulama holds the principle that the health risks of smoking cigarettes are dependent on usage, and that it is less dangerous than drinking alcohol (127).

Religion can have a strong influence on individual behaviour, and religiosity and spirituality are protective against smoking. The religious affiliations people have currently hold impacts whether they smoke or whether they are encouraged to smoke or to not smoke. Religious norms regarding smoking have been shown to be particularly influential on behaviour in contexts with weak tobacco control policies in place. A study by Koenig et al. concluded that religious people who regularly attend religious activities such as prayers or bible study were significantly less likely to smoke cigarettes, and that religious smokers smoked fewer cigarettes than less religious smokers (209).

Religious norms about smoking cigarettes had a greater impact than secular norms in driving behavioural change in countries with weak tobacco control such as Malaysia (210). It seems to be important to educate religious leaders where possible about the harms of smoking and to involve them in reaching out to the wider population.

3.5. Strength, limitations, and further work

3.5.1. Strengths

The main strength of this study is that this is a smokers and non-smokers purposive sampling qualitative study. This study invited 58 participants, which means a significant number of people participated in this qualitative study, in addition, this study also included various perspectives (male and female, wide age range, smokers and non-smokers).

Qualitative study captures the complexity, mess and contradiction that characterises the real world, yet allows us to make sense of patterns of meaning (188). This study understands people by discovering the meanings of their experiences and actions. Indonesian smokers and non-smokers' perspectives were discovered through recording what they say and considering the cultural settings in which this research was conducted. Due to the nature of qualitative study, this study is well suited for exploring participants' perspective through their experiences.

This study can be considered as the first qualitative study to investigate Indonesian smokers and non-smokers' health risk perceptions in association with smoking kretek cigarettes. It is also filling the gap in the knowledge about the smoking cigarettes. Furthermore, this study also provides a detailed understanding of the problem of smoking in Indonesia and exploring their risks in greater depth.

The findings from this study indicated that Indonesian is in the early stages of a tobacco epidemic where given its large number of male smokers and their wide misconceptions about the health risk of cigarettes. The results could inform policy makers to take appropriate and valid actions to reduce the number of male smokers and to prevent women from smoking.

3.5.2. Limitations

In consideration of the limited budget and time factors, recruitment was only conducted from three cities out of the 93 cities in Indonesia. Moreover, all participants were recruited from municipal offices. They may not represent a comprehensive view of smokers and non-smokers across the country.

Smoking status of participants were based on self-report which may be a socially desirability bias.

3.5.2.1. Limitations of qualitative study design

Qualitative study findings cannot be extrapolated for wider populations with the same degree of certainty that quantitative findings can, because the findings of research are not tested to discover whether they are statistically significant (189, 190). However, despite a lack of generalizability, this study provides a rich description of views, beliefs, and meanings. This study provided details for understanding the smoking problem in Indonesia and exploring the health risks of Indonesian smokers and non-smokers in greater depth.

3.5.2.2. Control of qualitative bias

Qualitative research is often criticized for lacking transparency and scientific rigour. It is also criticized for presenting compilations of impressions that are subject to research bias (189), and which may not be reproducible (190). Bias is commonly understood to be any influence that provides a distortion in the results of a study. Bias can be minimized by proper study design and implementation (211); although it is impossible to totally avoid biases, there are means to reduce potential bias that may occur during a study. Smith and Noble (2014) listed major biases as shown in Table 3-3, which explains steps taken to mitigate such biases in this study (212).

Table 3-3 Research bias mitigation

| Bias type | Mitigation |
|---------------------------------|--|
| Design | <p>Poor study design and incongruence between aims and methods increases the likelihood of design bias. To avoid this, the study objectives were clearly identified in the thesis introduction.</p> <p>Personal beliefs influence the choice of research question and methodology. The researcher's reflexivity accounted for her views, writing about the context in which the research took place, explaining the rationale for conducting the research, and the background of the study.</p> |
| Selection and participants | <p>Selection bias relates to both the process of recruiting participants and study inclusion criteria. Successful research begins with recruiting participants that meet the study aims. Purposive sampling strategies were employed in this study.</p> <p>Participant bias includes acquiescence bias and social desirability bias. This study using open-ended questions to prevent participants from simply agreeing, guiding them to provide truthful and honest answers about smoking behaviours by themselves and by their family and friends. The study also included non-smokers who can project their own feelings onto others and provide accurate, truthful, and representative answers.</p> |
| Data collection and measurement | <p>Data collection bias can occur when a researcher's personal beliefs influence the way information or data is collected. The researcher considered all the data obtained and analyse it with a clear and unbiased mind, not interpreting it to suit preconceived notions, which was reinforced by reflective practice throughout the research process, using notes to re-evaluate impressions and responses and ensure that pre-existing assumptions were kept at bay. The reflections section at the end of this chapter relates the findings back to the background of why this research was conducted in the first place. Although the researcher has personal experiences relating to smoking behaviours in Indonesia, she is aware of these and tried to obtain and analyse data with a clear and unbiased mind.</p> |
| Analysis | <p>When analysing data, the researcher may naturally look for data that confirms their hypotheses or confirms personal experience, overlooking data inconsistent with personal beliefs. This study clearly describes methods of gathering and analysing data. The researcher ensured that this study followed well-established analysis methods as identified by Braun and Clarke and considers the validity of individual themes in relation to the data set, to ascertain that themes genuinely represent the data set (197).</p> <p>Minutes of interviews and meetings were documented to keep track of emerging impressions of the meaning of data, and how codes relate to each other, and to ensure that interpretations of data are consistent and transparent.</p> <p>The researcher coded all the interviews, and for quality control purposes, 20% of the interviews were randomly selected and allocated to two other researchers (the research supervisors) for double coding.</p> |

3.5.3. Further work

For several poor tobacco farmers in Indonesia, growing tobacco can make obvious economic sense, therefore, there is a need for research on the use of

tobacco, clove plants for medicines or other uses than in the making of cigarettes so that farmers can use their crops for more useful products.

Results from this study concluded that the smoking cigarettes by women is socially inappropriate and that they seem to understand the health risks of smoking cigarettes. This should be carefully studied further with a view of maintaining this notion as these societies will probably also go through phases of female emancipation and economic development.

There is also a need for further research to understand effective public health campaign to raise awareness about the harmful effects of kretek cigarettes and any form of cigarettes products.

3.6. Conclusion

In this population, which has all the signs of being at an early stage of a tobacco epidemic with high prevalence in men and low prevalence in women, this study has shown gender difference in attitudes as well as behaviour, but generally poor understanding of the health risks.

Whilst kretek cigarettes, which are part of the heritage, are favoured by older smokers, things are changing, and younger smokers seem to prefer regular and manufactured kretek cigarettes. There are misconceptions about the relative health effects of different types of cigarettes, and attitudes that seem to be influenced by tobacco advertisements in a country where big tobacco has an increasing presence.

Few smokers are getting effective support to stop smoking, and health professionals who are needed to provide advice to smokers are reported as being smokers themselves.

Health professionals, public figures and religious leaders are immensely respected by the public and should set a good example by not smoking. The training of health professionals should cover tobacco problem.

The health professionals smoking behaviour example has an important influence on the rest of the community, thus, there is a need to understand

about health professionals' health risk perceptions which will be explained further in chapter four of this thesis.

3.7. Personal reflections

Research is a process of finding out something in a more or less systematic way, finding something that I do not know and maybe no one else either, it is about advancing the frontier of knowledge (213).

As an Indonesian who was born and grew up in Indonesia, I am aware that Indonesia has been far too permissive towards smoking habits. My father was a smoker, and so were two of my brothers. My father was a psychologist and carried out duties in the Indonesian army. Like most of his friends, he started smoking cigarettes when he was beginning his career as a soldier. Cigarettes were always available for free. When he became a commandant in a battalion, he was provided hundreds of Djarum Super cigarettes packages for free on a monthly basis. As a psychologist, my father knew about the risks of smoking but because he had few symptoms, he never tried to quit. He was always smoked kretek cigarettes and might have thought that these cigarettes are less dangerous than any other cigarettes. At the age of almost 52 he died due to smoking-related diseases (brain and lung cancer). Both my brothers who were smokers had stopped smoking after this. Their previous attempts to quit had been unsuccessful because they had not received any help from health professionals. Fortunately, however, they managed to quit with the support of our family. My journey as a witness of smoking cigarettes behaviour continued when I worked as a dentist. Both smoking and oral tobacco use damages mouth and teeth, I had a strong position from which I could advice and encourage my patients to stop smoking. Although I have learnt about the health risks of smoking behaviour and have studied about human behaviours when I was a medical student, I lacked knowledge on how to advise my patients to quit cigarettes effectively.

I continued my study to the public health major and was finally able to pursue my interests in conducting research regarding the experiences of Indonesian smokers. I wanted to know what and why people smoke, how they tried to give

up, what the differences between kretek and regular cigarettes are, what short- and long-term health risks that the people know. I understand that smoking cigarette problems are a very complex issue. As has been seen as a lesson to learn from developed countries that already are able to reduce the number of smokers. Prevention is perhaps the most effective way to reduce numbers and cut the behaviour chain, and this study might contribute to providing a unique picture of the views of Indonesian smokers and non-smokers of the role of kretek cigarettes in Indonesia. This is important to identify the directions in which action should be taken, and to stimulate further study to improve knowledge of the health risks amongst Indonesian people.

Reflecting on the phase when I was preparing the research proposal, I was worried about the number of participants who should be recruited in the research (60 participants). Based on what I heard from the experiences of other novice researchers, the steps for recruiting participants were anticipated to be very difficult. From the 60 people that I had approached, only two people could not be contacted because of wrong telephone numbers. The facts that I am Indonesian and have lived in Indonesia for most of my life gave me particular insights into understanding Indonesian culture and on how to approach people. In this study, I approached participants directly and I believe Indonesian trusted this approach as opposed to other approaches such as telephone or email invitation. Being an Indonesian language native speaker have gave me the privilege of understanding and gathering deeper meaning from what was said by my participants thus making it easy to translate to the English language. Furthermore, using same language made my participants to be more willing to participate in this study.

CHAPTER 4

QUANTITATIVE, WEB-BASED STUDY OF HEALTH PROFESSIONALS' PERCEPTIONS OF KERETEK RISKS

4.1. Introduction

Study qualitative shows that no ex-smokers get help from HPs to quit smoking, and many witnessed HPs are smokers themselves. Health professionals (HPs) have a very important role to play with respect to smoking behaviour. Smoking cessation interventions from health providers, such as asking about smoking status and offering help and advice, have been shown to be effective in helping people to stop smoking (214).

Several studies have been conducted in developed countries to assess the knowledge and practices of smoking cessation of HPs (215-218). However, despite the markedly high prevalence of smoking in Indonesia, none have investigated the perceptions of risk and attitudes to smoking among Indonesian HPs.

4.1.1. Impact of HPs giving advice

Physicians can help smokers who want to quit by giving advice, even if this is brief advice. Brief simple advice about quitting smoking increases the likelihood that their patients will stop smoking and maintain their non-smoking behaviours 12 months later (219). Advice from physicians is very important because of their close relationship with the patient and their frequent contact during their health consultations (220).

Based on a systematic review by Stead et al. (2013), physicians who advised their patients (as part of a minimal intervention for smoking cessation) increased their patients' quit rates (RR) 1.6 times, with a 95% confidence interval (CI) (1.42 to 1.94) (219). Moreover, a recent systematic review indicates that other health professionals such as dentists also have an important role in helping people to quit smoking. This research found that oral health professionals can increase tobacco abstinence rates by at least 1.7 times if they provide simple advice (OR 2.38, 95% CI 1.70 to 3.35) (221).

A report conducted by Cancer Research UK in 2007 found that most physicians and dentists believe that it is their responsibility to give advice to encourage smokers to give up smoking, but many do not do so routinely (220). There has never been a study of perception of Indonesian physicians and dentists regarding smoking and health problems.

4.1.2. Importance of HPs as a role model in smoking behaviour

In many countries, smoking is high among HPs themselves. HPs continue to use tobacco at high rates. HPs have high influence in their societies (222). In cigarette smoking behaviours, prevention, and cessation, health professionals such as physicians, dentists, nurses, midwives, nutritionists and others are particularly influential in society (223). It has been said that a smoking doctor is worth USD 100,000 to tobacco companies, because the bad example they set enables and encourages normal smokers, who perceive that smoking cannot be as dangerous as they have been told (8).

A previous systematic review by Nilan et al in the United Kingdoms, representing 457,415 HPs from 63 countries found that between 2000-2014, on average across all the countries included 21% of HPs were smokers. Based on gender differences, the pooled prevalence of male HPs smokers was almost double that found in female doctors 31% (95% CI 28–34) vs 17% (95% CI 15–18). The study also suggested that the prevalence of smoking in HPs was decreasing over time in high and upper middle income countries, but not changing in lower middle and lower income countries (224).

A study about smoking behaviour and tobacco control among medical doctors was conducted in a neighbouring country (Lao) to Indonesia. The study was conducted by Phengsavanh et al. (2008). In this study, 855 of Lao's medical doctors participated. The result showed that almost all medical doctors had high knowledge about the health risks of cigarette use. However, physicians who smoked had a lower support for tobacco control compared to non-smokers (53).

There is a study which has looked at the prevalence of smoking in physicians in Indonesia, but the study is quite small and out of date. This study, conducted

by Nawi et al., in 2007 recruited 447 Indonesian doctors, and showed that 22% (n=50) of male and 1% (n=2) of female physicians were current smokers; the prevalence is higher in men as found in the general population (26).

A recent study about the perception of health risks from smoking among nursing students at Maranatha University Indonesia found that around 52% (n=43) of male and 7% (n=8) of female students are current smokers (128). This study showed that 87.3% of participants were aware of smoking-related disease risks and 96.4% wanted to give smoking cessation advice. The majority of non-smokers (97%) and more than half of smoking participants (60.8%) agreed that they have a position as a role model in relation to not smoking (128)

It is evident that HPs have an important non-smoking role as exemplars for their patients regarding healthy behaviour. They also have an important role in giving advice to their patients, and in many countries also have a role in supporting their patients to quit by providing smoking cessation medication and/or referral to specialist services, which both increase further the likelihood of a smoker quitting (225).

4.2. Rationale for the study

Little is known about the smoking-related attitudes and practises of HPs in Indonesia, but available evidence tentatively suggests that there are still quite high smoking rates among male HPs. Kretek is the predominant cigarette and is associated with similar risks to regular cigarettes (chapter 2), but it is unknown whether they are aware of the risks of smoking in general and if they perceive differences in the risk of kretek and regular cigarettes. Qualitative studies analysed in chapter three showed that no ex-smoker participants reported having received help from health professionals through their process to stop smoking. Furthermore, participants reported that they still witnessed physicians smoking cigarettes. Given the important role of health professionals in relation to smoking, data is needed to understand the smoking behaviours and attitudes of both of these health professional groups, their attitudes and practice in terms of advising patients.

This study therefore aims to understand doctors' and dentists' perspectives on smoking kretek cigarettes, their perceptions of associated health risks or benefits, and their perceived role in helping smokers to stop.

4.3. Data collection

4.3.1. Study population

The target population comprised physicians and dentists from Aceh, Bali, Balikpapan, Cirebon, DKI Jakarta, Palembang, and Bandung.

The official professional organisations for physicians in Indonesia are the Ikatan Dokter Indonesia (IDI) or the Indonesian Medical Association; and for dentists, the Perhimpunan Dokter Gigi Indonesia (PDGI) or Unity Dentist Indonesia (UDI). All of these groups have organisational branches in most towns. There were approximately 1454 members of IDI and PDGI from these seven towns at the time of fieldwork during 2019 (226, 227).

4.3.2. Recruitment

First stage

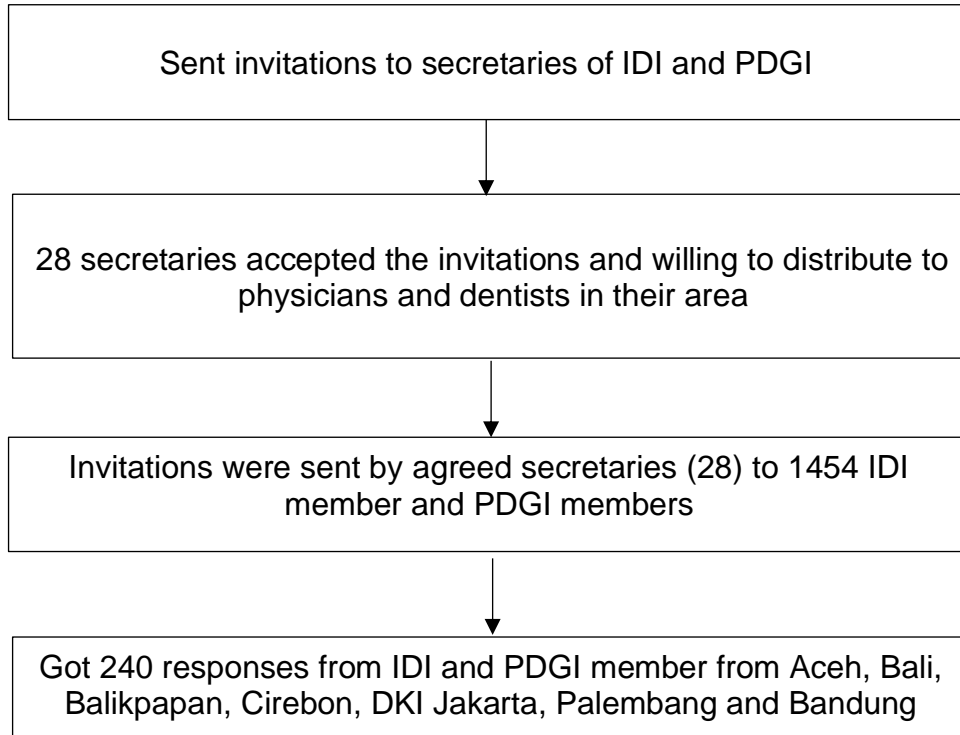
Invitations were sent to secretaries of IDI and PDGI via contact email addresses from their official websites (Appendix 12) which resulted in receiving feedback from 28 secretaries of IDI and PDGI branches in numerous provinces and major cities, specifically Aceh, Bali, Balikpapan, Cirebon, DKI Jakarta, Palembang, and Bandung. The secretaries sent a study invitation to (653 and 801) IDI and PDGI members.

Second stage

The IDI and PDGI secretaries approached physicians and dentists by email addresses registered with their organisations and invited them to take part (Appendix 13) Information about the study and a link to the survey was provided for potential participants. The link directly opened in their browsers to the Bristol Online Survey (BOS) website. However, in the event that the link did not work, the email also explained about how to access the survey by

entering a specific URL (Universal resource location/ web addresses). The recruitment process shows in Figure 4-1.

Figure 4-1 Flow chart of the recruitment process



4.3.3. Data collection instrument

Participants (Indonesian HPs) were asked a total of 20 questions in the survey (Appendix 15), with additional space for free text in several questions. The survey took approximately 10 minutes to complete. General demographic items covered age, gender, workplace location, occupation (physician or dentist), work location, and smoking status. Health risk perceptions were assessed using questionnaires adapted from the World Health Organization Health Professionals' Tobacco Survey 2004 (228) with the addition of several questions to gather information about the perceived differences in smoking kretek and non-kretek cigarettes, knowledge and attitudes about the harms of smoking cigarettes, effects of smoking on non-smokers, worksite practice, and perceptions about the development of tobacco control policy in the Indonesia.

A pilot survey with similar target participants (10 Indonesian physicians and dentists who volunteered from contacts known to the researcher) prior to using the web-based survey questions in was conducted, to ensure that the

participants could access the hosting website and confirm that the questions were easy to understand. The results were excluded in the final data analysis. The questionnaire was edited and refined based on feedback from the pilot survey. The final survey is included in Appendix 15.

4.3.4. Sample size calculation

The researcher estimated that a minimum sample size of 228 was needed to conduct this cross-sectional study. Using statistical Epi info 7 to calculate the sample size needed for this study, and assuming that percentages were to be estimated to within a 5% margin of error using 95 % confidence intervals, the researcher estimated that a minimum sample size of 228 was needed to estimate HPs smoking prevalence in Indonesia. The numbers of dentist and physicians who were invited were 1454 from seven different cities/ provinces in Indonesia (Jakarta, Bandung, Palembang, Balikpapan, Cirebon, Aceh, and Bali), so that our required sample size would be reached if response rate was at least 16%.

4.3.5. Data collection

In choosing the online data collection tools, the researcher carefully reviewed the site's data security policy and chose BOS (Bristol Online Survey) because it is a powerful and easy-to-use tool. All University of Nottingham research students are eligible to use BOS as a way of conducting research surveys (229). In the BOS website, to ensure that sensitive information could be transmitted securely, all survey responses were collected through standard technology, including establishing an encrypted link between the web server and browser.

The researcher designed a method so that the participants could refuse to answer some questions if they were unwilling to do so; respondents were able to decline to answer by choosing "other" or "prefer not to say" in such cases.

After the participants read the study information, they ticked a checkbox to confirm that they had read the information and agreed to take part in the research. The informed consent form (Appendix 16) appeared in the first page of the online survey, allowing participants to review the information and verify

that they were still willing to participate, allowing them to reaffirm their consent. The information explained that the data will remain confidential, and the email address (if provided) remained separate from the rest of the data. All participants filled in the surveys anonymously.

To thank participants for doing the survey, the researcher offered a chance to participants to take part in a prize draw for a Carrefour shopping voucher worth Rp. 1.5 million (IDR) (~ £100 GBP) for the lucky winner, who was duly notified by email on 10/10/2017.

4.3.6. Analysis

After data collection, the researcher transferred the data into Microsoft Excel for quantitative analysis using the statistical software SPSS (version 25). No identifiable data were imported into Microsoft Excel, but to a separate encrypted file. Cross-tabulation was used to provide information about the data collected using simple descriptive statistics, including percentage distributions. Chi-square test was performed to understand the difference between dentists and physicians with respect to proportions of the current smokers, and to test proportion of HPs who provide smoking cessation.

4.3.7. Ethical approval

The study was approved by Medical School Ethics Committee at the University of Nottingham and the National Institute of Health and Research Development (NIHRD), Ministry of Health, Republic of Indonesia (Appendix 17, Appendix 18).

4.4. Results

4.4.1. Dentist and physician characteristics

The response rate is 16.5%, the secretaries of IDI and PDGI were contacted members of IDI and PDGI (653 doctors and 801 dentists) and 240 doctors and dentists received the invitation to take part.

Table 4-1 describes the socio-demographic characteristics of respondents (dentists and physicians). Out of 240 respondents, 108 (45%) were physicians, and the remaining 132 (55%) were dentists, with more female (n=159) than

male participants (n=81), for both professions. In terms of age distribution, the majority of physicians (49%) were aged between 25-34 years old, while 50.7% of dentists were 35-44 years old.

The vast majority of physician participants in this study (85%) were working either in hospitals or private clinics, while dentists' workplaces were distributed evenly between hospitals, clinics, and community health centres. Both dentists and physicians mainly lived in urban areas (72%).

Table 4-1 Socio-demographic characteristics of dentists and physicians

| | Physician n (%) | Dentist n (%) | Total n (%) |
|--|-----------------|---------------|-------------|
| Gender | | | |
| Male | 46 (42.6) | 35 (26.5) | 81 (33.7) |
| Female | 62(57.4) | 97(73.5) | 159(65.4) |
| Age | | | |
| Younger than 25 | 0 | 1 (0.76) | 1 (0.41) |
| 25-34 | 53 (49.0) | 44 (33.3) | 97 (40.4) |
| 35-44 | 30 (27.7) | 67 (50.7) | 97 (40.4) |
| 45-54 | 20 (18.5) | 14 (10.6) | 34 (14.1) |
| 55-64 | 5 (4.6) | 5 (3.7) | 10 (4.1) |
| 65 or older | 0 | 1 (0.7) | 1 (0.4) |
| Location of practice | | | |
| Hospital | 58 (53.7) | 27 (20.4) | 85 (35.4) |
| Private clinic | 34 (31.4) | 42 (31.8) | 76 (31.6) |
| Community health centre | 8 (7.4) | 16 (12.1) | 24 (10.0) |
| Hospital, private clinic | 4 (3.7) | 27 (20.4) | 31 (12.9) |
| Hospital, community health centre | 1 (0.9) | 2 (1.5) | 3 (1.2) |
| Private clinic, community health centre | 2 (1.8) | 17 (12.8) | 19 (7.9) |
| Hospital, private clinic, community centre | 0 | 1 (0.7) | 1 (0.4) |
| Job location | | | |
| Urban | 78 (72.2) | 96 (72.7) | 174 (72.5) |
| Rural | 7 (6.4) | 9 (6.8) | 16 (6.6) |
| Suburban | 21 (19.4) | 26 (19.7) | 47 (19.5) |

4.4.1.1. General information about smoking behaviour of physicians and dentists

Table 4-2 describes respondents' smoking status. The proportion of HPs with a history of smoking currently or previously was quite high, reported in 13 (12%) of physicians and 10(7.6%) of dentists. There were 25 (23%) physicians and 22 (16%) dentists who were current smokers. A total of 19% (95%CI 14.8-

25.2) of physicians and dentist were current smokers.13 physicians and 10 dentists were ex-smokers.

Table 4-2 General smoking profile of physicians and dentists

| | Physician n (%) | Dentist n (%) | Total n (%) | 95% CI |
|---------------------------|-----------------|---------------|-------------|-----------|
| History of smoking | | | | |
| Current smokers | 25 (23.1) | 22 (16.7) | 47 (19.6) | 14.8-25.2 |
| Ex-smokers | 13 (12.0) | 10 (7.6) | 23 (9.6) | 6.2-14.0 |
| Current smokers | | | | |
| Male | 20 (43.4) | 15 (42.8) | 35 (43.1)) | 32.2-54.7 |
| Female | 5 (8.0) | 7 (7.2) | 12 (7.6) | 4.0-12.8 |
| Ex-smokers | | | | |
| Males | 10 (9.2) | 9 (6.8) | 19 (7.9) | 6.1-9.5 |
| Female | 3 (2.7) | 1 (0.7) | 4 (1.6) | 0.5-3.8 |

Table 4-3 Smoking profile of physicians and dentists

| | Physician n (%) | Dentist n (%) | Total n (%) |
|---|-----------------|---------------|-------------|
| Age began smoking (ex-smokers and current smokers) | | | |
| <25 years | 29 (78.9) | 25 (78.0) | 54 (78.6) |
| 25-34 | 8 (21.0) | 5 (15.6) | 13 (18.6) |
| 35-44 | 0 | 1 (3.1) | 1 (1.4) |
| Time since last smoke (ex-smokers) | | | |
| Less than one month | 1 (7.6) | 1 (10.0) | 2 (8.6) |
| One month or longer, but less than six months | 1 (7.6) | 2 (2.0) | 3 (13.0) |
| Six months or longer, but less than one year | 5 (38.4) | 2 (2.0) | 7 (29.1) |
| One year or longer | 6 (46.1) | 5 (50.0) | 11 (47.8) |
| How often smoked (in current smokers) | | | |
| Occasionally | 15 (60.0) | 18 (81.8) | 33 (70.2) |
| Everyday | 10 (40.0) | 4 (18.1) | 14 (29.7) |

4.4.1.2. Perceptions of physicians and dentists of kretek and non-kretek cigarette harms

Table 4-4 compare physicians' and dentists' beliefs about the benefits and harms of kretek and non-kretek cigarettes. About 29% of physicians stated that their patients perceive kretek as a traditional remedy for illness, and 38% of dentists shared this opinion, which was largely isolated to kretek rather than regular cigarettes.

Many physicians and dentists were in agreement that smoking kretek cigarettes has become a normative part of Indonesian culture, as affirmed by around 46% of respondents, while only 5.5% of physicians and 5.3% of dentists shared this view about regular cigarettes, and 10% of participants thought that both kretek and regular cigarettes as a part of the culture.

A high proportion felt that smoking was used for socialising, and that was especially the case for regular cigarettes, 38% of physicians and 40% of dentists (respectively).

Most respondents also thought that people are smoking either kretek or regular cigarettes as a result of nicotine addiction (40% for physicians and 28% for dentists), but a reasonable proportion also thought that people are smoking neither kretek nor regular cigarettes as a result of nicotine addiction (16% for physicians and 18% for dentists).

The majority of the respondents suggested that both smoking regular cigarettes and kretek is a result of habit (50% of physicians and 38% of dentists). Meanwhile 24% of physicians and 25% of dentists thought that only smoking regular cigarettes is a result of habit; these percentages are slightly higher than respondents who suggest that only smoking kretek is a result of habit (13%).

In terms of the opinions about the harms of smoking cigarettes on health (Table 4-5), most physicians and dentists were aware that smoking both kretek and regular cigarettes will cause illness related to the respiratory system, such as lung cancer (91% of physicians and 82% of dentists), and lower respiratory tract infections (92% of physicians and 82% of dentists). The percentages

were slightly lower for other illnesses (between 50% of physicians and 75% of dentists) that are not directly related to the respiratory system, such as diabetes, hypertension, bladder cancer, pancreatic cancer, oesophagus cancer, nasopharynx, colorectal cancer, cataracts, and leucoplakia. It is worth noting that there were physicians and dentists unsure about the harms of smoking to cancer, such as, around 31-35 % of HPs were unsure about the effects of smoking to breast, bladder, pancreatic and colorectal cancer. A smaller number of HPs were unsure about the relation of smoking to oesophagus cancer (15%), nasopharynx cancer (8%) and lung cancer (3%), colorectal cancer (35%) to smoking.

Table 4-4 Perceived benefits of regular and kretek cigarettes

| | Physicians (%) | Dentists (%) | Total (%) |
|---|----------------|--------------|------------|
| Which of the following do you think are reasons for people to smoke kretek and non-kretek cigarettes? | | | |
| As traditional remedy for illness | | | |
| Kretek but not regular cigs | 32 (29.6) | 51 (38.6) | 83 (34.5) |
| Regular cigs but not kretek | 8 (7.4) | 4 (3.0) | 12 (5.0) |
| Kretek, regular cigs | 3 (2.7) | 1 (0.7) | 4 (1.6) |
| Neither | 65 (60.0) | 75 (56.0) | 140 (58.0) |
| Missing* | | | 1 (0.4) |
| As part of the culture | | | |
| Kretek but not regular cigs | 50 (46.2) | 61 (46.2) | 111 (46.2) |
| Regular cigs but not kretek | 6 (5.5) | 7 (5.3) | 13 (5.4) |
| Kretek, regular cigs | 18 (16.6) | 6 (4.5) | 24 (10.0) |
| Neither | 21 (19.4) | 45 (34.0) | 66 (27.5) |
| Missing* | 13 | 13 | 26 |
| To be sociable | | | |
| Kretek but not regular cigs | 11 (10.1) | 16 (12.1) | 27 (11.2) |
| Regular cigs but not kretek | 42 (38.8) | 54 (40.1) | 96 (40.0) |
| Kretek, regular cigs | 38 (35.1) | 30 (22.2) | 68 (28.3) |
| Neither | 17 (15.7) | 32 (24.2) | 49 (20.4) |
| Because of addiction to nicotine | | | |
| Kretek but not regular cigs | 19 (17.5) | 36 (27.2) | 55 (22.9) |
| Regular cigs but not kretek | 18 (16.7) | 24 (18.2) | 42 (17.5) |
| Kretek, regular cigs | 44 (40.7) | 37 (28.0) | 81 (33.7) |
| Neither | 18 (16.7) | 28 (21.2) | 46 (19.1) |
| Missing* | 9 | 7 | 16 |
| Habit | | | |
| Kretek but not regular cigs | 11 (10.1) | 21 (15.9) | 32 (13.3) |
| Regular cigs but not kretek | 26 (24.0) | 34 (25.7) | 60 (25.0) |
| Kretek, regular cigs | 55 (50.9) | 51 (38.6) | 106 (44.1) |
| Neither | 16 (14.8) | 26 (19.7) | 42 (17.5) |

Table 4-4 Perceived benefits of regular and kretek cigarettes

| | Physicians (%) | Dentists (%) | Total (%) |
|-----------------------------|----------------|--------------|------------|
| Hypertension | | | |
| Kretek but not regular cigs | 5 (4.6) | 5 (3.7) | 6 (2.5) |
| Regular cigs but not kretek | 2 (1.8) | 5 (3.7) | 5 (2.1) |
| Kretek, regular cigs | 75 (69.4) | 77 (58.3) | 122 (50.8) |
| Neither | 9 (8.3) | 16 (12.1) | 27 (11.2) |
| Unsure | 17 (15.7) | 29 (21.9) | 80 (33.3) |
| Oesophagus cancer | | | |
| Kretek but not regular cigs | 4 (3.7) | 6 (4.5) | 10 (4.1) |
| Regular cigs but not kretek | 1 (0.9) | 6 (4.5) | 7 (2.9) |
| Kretek, regular cigs | 80 (75) | 94 (71.2) | 174 (72.5) |
| Neither | 4 (3.7) | 8 (6.0) | 12 (5) |
| Unsure | 19 (17.6) | 18 (13.6) | 37 (15.4) |
| Breast cancer | | | |
| Kretek but not regular cigs | 3 (2.7) | 3 (2.2) | 6 (2.5) |
| Regular cigs but not kretek | 2 (1.8) | 3 (2.2) | 5 (2.1) |
| Kretek, regular cigs | 47 (43.5) | 69 (52.2) | 116 (48.3) |
| Neither | 19 (17.5) | 19 (14.3) | 38 (15.8) |
| Unsure | 37 (34.2) | 38 (28.8) | 75 (31.2) |
| Nasopharynx cancer | | | |
| Kretek but not regular cigs | 6 (5.5) | 11 (8.3) | 17 (7.1) |
| Regular cigs but not kretek | 1 (0.9) | 5 (3.8) | 6 (2.5) |
| Kretek, regular cigs | 91 (84.2) | 101 (76.5) | 192 (80) |
| Neither | 0 | 4 (3.0) | 4 (1.6) |
| Unsure | 10 (9.2) | 11 (8.3) | 21 (8.7) |
| Colorectal cancer | | | |
| Kretek but not regular cigs | 3 (2.8) | 6 (4.5) | 9 (3.7) |
| Regular cigs but not kretek | 2 (1.8) | 2 (1.5) | 4 (1.6) |
| Kretek, regular cigs | 48 (44.4) | 60 (45.4) | 108 (45) |
| Neither | 18 (16.6) | 16 (12.1) | 34 (14.1) |
| Unsure | 37 (34.2) | 48 (36.3) | 85 (35.4) |

Table 4-4 Perceived benefits of regular and kretek cigarettes

| | Physicians (%) | Dentists (%) | Total (%) |
|-----------------------------|----------------|--------------|------------|
| Cataract | | | |
| Kretek but not regular cigs | 2 (1.8) | 9 (6.8) | 11 (4.6) |
| Regular cigs but not kretek | 3 (2.7) | 3 (2.2) | 6 (2.5) |
| Kretek, regular cigs | 36 (33.3) | 36 (27.2) | 72 (30) |
| Neither | 28 (26) | 32 (24.2) | 60 (25) |
| Unsure | 39 (36.1) | 52 (39.4) | 91 (38) |
| Stroke | | | |
| Kretek but not regular cigs | 5 (4.5) | 6 (4.5) | 11 (4.5) |
| Regular cigs but not kretek | 2 (1.8) | 7 (5.3) | 9 (3.7) |
| Kretek, regular cigs | 81 (75) | 82 (62.1) | 163 (67.9) |
| Neither | 3 (2.7) | 9 (6.8) | 12 (4.0) |
| Unsure | 17 (15.7) | 28 (21.2) | 45 (18.7) |
| Leucoplakia | | | |
| Kretek but not regular cigs | 4 (3.7) | 11 (8.3) | 15 (6.2) |
| Regular cigs but not kretek | 3 (2.7) | 6 (4.5) | 9 (3.7) |
| Kretek, regular cigs | 55 (50.1) | 84 (63.6) | 139 (57.9) |
| Neither | 7 (6.4) | 8 (3.8) | 15 (6.2) |
| Unsure | 38 (35.1) | 22 (16.6) | 60 (25) |

Table 4-5 HPs perceived harms of smoking

| | Physicians | Dentists | Total |
|--|------------|------------|------------|
| Lung cancer | | | |
| Kretek but not regular cigs | 4 (3.7) | 12 (9.0) | 16 (6.6) |
| Regular cigs, but not kretek | 2 (1.8) | 6 (4.5) | 8 (3.3) |
| Kretek, regular cigs | 99 (91.6) | 109 (82.5) | 208 (86.6) |
| Neither | 0 | 1 (0.7) | 1 (0.4) |
| Unsure | 3 (2.7) | 4 (3.0) | 7 (2.9) |
| Lower respiratory tract infection | | | |
| Kretek but not regular cigs | 3 (2.7) | 7 (5.3) | 10 (4.1) |
| Regular cigs, but not kretek | 1 (0.9) | 7 (5.3) | 8 (3.3) |
| Kretek, regular cigs | 100 (92.6) | 109 (82.6) | 209 (87.0) |
| Neither | 1 (0.9) | 4 (3.0) | 5 (2.1) |
| Unsure | 3 (2.7) | 5 (3.7) | 8 (3.3) |
| Diabetes | | | |
| Kretek but not regular cigs | 4 (3.7) | 3 (2.2) | 7 (2.9) |
| Regular cigs, but not kretek | 1 (0.9) | 4 (3.0) | 5 (2.0) |
| Kretek, regular cigs | 33 (30.5) | 35 (26.5) | 68 (28.3) |
| Neither | 29 (26.8) | 40 (30.3) | 69 (28.7) |
| Unsure | 41 (37.9) | 50 (37.8) | 91 (37.9) |
| Bladder cancer | | | |
| Kretek but not regular cigs | 3 (2.7) | 5 (3.7) | 8 (3.3) |
| Regular cigs | 3 (2.7) | 2 (3.7) | 5 (3.3) |
| Kretek, regular cigs | 55 (50.9) | 61 (46.2) | 116 (48.3) |
| Neither | 12 (11.1) | 19 (14.3) | 31 (12.9) |
| Unsure | 35 (32.4) | 45 (32.4) | 80 (33.3) |
| Pancreatic cancer | | | |
| Kretek but not regular cigs | 3 (2.7) | 3 (2.2) | 6 (2.5) |
| Regular cigs, but not kretek | 2 (1.8) | 3 (2.2) | 5 (2.1) |
| Kretek, regular cigs | 54 (50.0) | 68 (51.2) | 122 (50.8) |
| Neither | 11 (10.1) | 16 (12.1) | 27 (11.2) |
| Unsure | 38 (35.1) | 42 (31.8) | 80 (33.3) |

Table 4-6 presents data about the role that HPs perceive for themselves in advising their patients who smoke and their position as role models for their patients.

Almost all (97% of physicians and 99% of dentists) think that HPs serve as role models for their patients and the public, and they should set a good example by not smoking.

The data showed that almost 100% (between 97% of physicians and 99% of dentists) reported that they gave advice to their patients to quit smoking at their worksite practice. Respondents also are in strong agreement that HPs should routinely ask about their patients' smoking habits (94% and 96% for physicians and dentists, respectively).

The majority (99%) of participants felt that HPs should routinely advise patients who smoke to avoid smoking around children. They believe that HPs should provide support to patients in helping them to quit (94% and 97% of physicians and dentists). Respondents were in strong agreement that HPs should get specific training on smoking cessation and support patients with smoking cessation programmes (94% and 97% of physicians and dentists, respectively). Almost a quarter of HPs did not think that smoking HPs would be less likely to advise their patients to quit smoking (23%), and some did not believe that the chance of patients quitting smoking was higher if their HPs did not smoke (24% of physicians and 24% of dentists).

Table 4-6 HPs' role in smoking and smoking cessation

| | Physicians (%) | Dentists (%) | Total (%) |
|--|----------------|--------------|------------|
| Advise patients to quit | | | |
| Yes | 107 (99.1) | 129 (97.7) | 239 (99.6) |
| No | 1 (0.93) | 0 | 1 (0.42) |
| Unsure | 0 | 2 (1.5) | 2 (0.8) |
| HPs should routinely ask about patient smoking habits | | | |
| Yes | 102 (94.4) | 127 (96.2) | 229 (95.4) |
| No | 3 (2.7) | 3 (2.2) | 6 (2.5) |
| Unsure | 3 (2.7) | 2 (2.2) | 5 (2.1) |
| HPs serve as role models for their patients and the public | | | |
| Yes | 105 (97.2) | 130 (98.5) | 235 (98) |
| No | 2 (1.8) | 1 (0.7) | 3 (1.2) |
| Unsure | 1 (0.9) | 1 (0.7) | 2 (0.8) |
| HPs should set a good example by not smoking | | | |
| Yes | 107 (99) | 130 (98.5) | 237 (98.7) |
| No | 1 (1.8) | 1 (0.7) | 2 (1.2) |
| Unsure | 0 | 1 (0.7) | 1 (0.8) |
| Patient chances of quitting smoking are increased if HPs do not smoke | | | |
| Yes | 81 (75) | 103 (78) | 184 (77) |
| No | 20 (18.5) | 18 (13.6) | 38 (15.8) |
| Unsure | 7 (6.5) | 11 (8.3) | 18 (7.5) |
| HPs who smoke are less likely to advise their patients to quit smoking | | | |
| Yes | 82 (76) | 101 (76.5) | 183 (76.2) |
| No | 17 (15.7) | 18 (13.6) | 35 (14.6) |
| Unsure | 9 (8.3) | 13 (9.9) | 22 (9.1) |

Table 4-6 HPs' role in smoking and smoking cessation

| | Physicians (%) | Dentists (%) | Total (%) |
|---|----------------|--------------|------------|
| HPs should get specific training on cessation methods | | | |
| Yes | 98 (90.7) | 117 (88.6) | 215 (89.6) |
| No | 6 (5.5) | 8 (6) | 14 (5.9) |
| Unsure | 4 (3.7) | 7 (5.3) | 11 (4.5) |
| HPs should routinely advise patients who smoke to avoid smoking around children | | | |
| Yes | 102 (94.4) | 127 (96.2) | 229 (95.4) |
| No | 3 (2.7) | 3 (2.2) | 6 (2.5) |
| Unsure | 3 (2.7) | 2 (1.5) | 5 (2.1) |
| HPs should provide support to patients in helping them to quit | | | |
| Yes | 102 (94.4) | 128 (97) | 230 (95.9) |
| No | 2 (2.7) | 1 (0.7) | 3 (1.2) |
| Unsure | 4 (2.7) | 3 (2.2) | 7 (2.9) |

Table 4-7 shows survey data concerning HPs' opinions on the harms caused to non-smokers by active smokers (i.e., passive smoking). Very high percentages for both physicians and dentists think that exposure to second-hand smoke from either kretek or regular cigarettes can cause sudden death syndrome in infants, heart diseases in adults, pneumonia in children, and birth defects (75% of physicians and 85% of dentists). The percentages are less for other illness such ear infection, and leukaemia (23% and 28% of physicians and dentists and 69 % of physicians and 70% of dentists). However, 13% of respondents erroneously think that smoking cigarettes causes chickenpox in children.

Table 4-7 Dentist and physician views on potential harms caused to non-smokers by passive smoking

| | Physicians (%) | Dentists (%) | Total (%) |
|-------------------------------------|----------------|--------------|------------|
| Sudden infant death syndrome | | | |
| Kretek, but not regular cigs | 3 (2.7) | 8 (6.0) | 11 (4.5) |
| Regular cigs, but not kretek | 3 (2.7) | 4 (3.0) | 7 (2.9) |
| Both | 89 (82.4) | 114 (86.3) | 203 (84.6) |
| Neither | 13 (12.0) | 6 (4.5) | 19 (8.0) |
| Chickenpox in children | | | |
| Kretek, but not regular cigs | 2 (1.8) | 1 (0.7) | 3 (1.2) |
| Regular cigs, but not kretek | 1 (0.9) | 4 (3.0) | 5 (2.1) |
| Both | 10 (9.2) | 23 (17.4) | 33 (13.7) |
| Neither | 91 (84.2) | 97 (73.5) | 188 (78.3) |
| Missing* | 4 | 7 | 11 |
| Heart disease in adults | | | |
| Kretek, but not regular cigs | 5 (4.6) | 6 (4.5) | 11 (4.5) |
| Regular cigs, but not kretek | 0 | 6(4.5) | 6 (2.5) |
| Both | 86 (79.6) | 102 (77.2) | 188 (78.3) |
| Neither | 17 (15.7) | 17 (12.8) | 34 (14.1) |
| Pneumonia in children | | | |
| Kretek, but not regular cigs | 5 (4.6) | 8 (6.0) | 13 (5.4) |
| Regular cigs, but not kretek | 1 (0.9) | 5 (3.8) | 6 (2.5) |
| Both | 92 (85.2) | 105 (79.5) | 197 (82.3) |
| Neither | 10 (9.2) | 12 (9.0) | 22 (9.1) |
| Missing* | | | 2 (0.8) |
| Ear infections in children | | | |
| Kretek, but not regular cigs | 3 (3.0) | 3 (2.0) | 6 (3.0) |
| Regular cigs, but not kretek | 1 (0.9) | 3(2.0) | 4 (2.0) |

Table 4-7 Dentist and physician views on potential harms caused to non-smokers by passive smoking

| | Physicians (%) | Dentists (%) | Total (%) |
|------------------------------|----------------|--------------|------------|
| Both | 25 (23.1) | 36 (28.0) | 61 (26.0) |
| Neither | 78 (73.0) | 85 (67.0) | 163 (70.0) |
| Missing* | 1 | 5 | 6 |
| Leukaemia | | | |
| Kretek, but not regular cigs | 5 (4.6) | 3 (2.2) | 8 (3.3) |
| Regular cigs, but not kretek | 0 | 6 (4.5) | 4 (1.7) |
| Both | 75 (69.4) | 93 (70.4) | 110 (69.7) |
| Neither | 27(25) | 30 (22.4) | 117 (23.7) |
| | | | |
| Birth defect | | | |
| Kretek, but not regular cigs | 5 (4.6) | 3 (2.2) | 8 (3.3) |
| Regular cigs, but not kretek | 0 | 6 (4.5) | 6 (2.5) |
| Both | 75 (69.4) | 93 (70.4) | 168 (70) |
| Neither | 27 (25) | 30 (22.4) | 57 (23.7) |

4.4.2. Worksite practice

4.4.2.1. smoke-free enforcement

| | Physicians (%) | Dentists (%) | Total (%) |
|--|----------------|--------------|------------|
| What sort of smoke-free policy is in place at your workplace? | | | |
| No smoking policy in place | 9 (8.3) | 18 (13.6) | 27 (11.2) |
| No smoking allowed at all on the premises | 74 (68.5) | 85 (64.4) | 159 (66.2) |
| Smoking room available | 25 (23.1) | 29 (22) | 54 (22.5) |
| Are smoke-free policies enforced at your workplace? | | | |

| | | | |
|---|-----------|------------|------------|
| Yes | 96 (88.8) | 117 (88.6) | 213 (88.7) |
| No | 12 (11.1) | 15 (11.3) | 27 (11.2) |
| I feel well prepared when counselling patients on how to stop cigarette smoking | | | |
| Yes | 51 (47.2) | 43 (32.6) | 94 (45.0) |
| No | 57 (52.7) | 89 (67.4) | 146 (60.0) |
| Have you had any training in how to advise smokers to stop? | | | |
| Yes | 98 (90.7) | 117 (88.6) | 215 (89.6) |
| No | 8 (8.3) | 15 (11.6) | 23 (9.8) |
| I have received formal training during medical school | | | |
| Yes | 31 (28.7) | 25 (19.0) | 56 (45.0) |
| No | 77 (71.3) | 107 (81.0) | 184(76.1) |
| I have received formal training during postgraduate education | | | |
| Yes | 15 (13.9) | 12 (9.1) | 27 (11.2) |
| No | 93 (86.0) | 120 (90.9) | 213 (88.0) |
| I have attended conferences, symposia, or workshops to receive formal training | | | |
| Yes | 29 (26.8) | 20 (15.1) | 49 (20.4) |
| No | 79 (73.0) | 112 (84.0) | 191 (78.5) |

presents data related to HP awareness on the worksite practice of smoke-free enforcement. 88% of physicians and 88% of dentists confirmed that their worksite practices have enforced smoke-free policies. 8% and 13% physicians and dentists (respectively) reported not having a no-smoking policy in place. While most respondents said that no smoking was allowed at all on the premises of their worksite practice (68% and 64%), around 23% of physicians and 22% of dentists reported that a smoking room was available at their worksite.

In terms of training to support their patients to quit, more than half of physicians and dentists said that they do not feel well prepared when counselling patients on how to stop cigarette smoking (52% of physicians and 67% of dentists). A high percentage of participants said that they had received training (88% of physicians and 89% of dentists), but a low percentage had received training in medical school (28% and 19%), postgraduate education (13% and 9%) and attended conference, symposia, or workshops for formal training (26% and 15%) (respectively).

Table 4-9 shows participants' opinions about what policies are required from the Indonesian government; 84% of physicians and 99% of dentists agreed that all available policies should be implemented, including the prohibition of smoking in enclosed public places, increased tobacco duties, enforcement of under-age sales restrictions, large text health warnings on cigarette packages, banning sport sponsorship by the tobacco industry, introducing smoking cessation services, and facilitating access to smoking cessation medication, however 23% and 26% of physicians and dentists think a complete ban on the advertising of tobacco products is not necessary.

Table 4-8 Worksite practice of smoke-free enforcement

| | Physicians (%) | Dentists (%) | Total (%) |
|---|----------------|--------------|------------|
| What sort of smoke-free policy is in place at your workplace? | | | |
| No smoking policy in place | 9 (8.3) | 18 (13.6) | 27 (11.2) |
| No smoking allowed at all on the premises | 74 (68.5) | 85 (64.4) | 159 (66.2) |
| Smoking room available | 25 (23.1) | 29 (22) | 54 (22.5) |
| Are smoke-free policies enforced at your workplace? | | | |
| Yes | 96 (88.8) | 117 (88.6) | 213 (88.7) |
| No | 12 (11.1) | 15 (11.3) | 27 (11.2) |
| I feel well prepared when counselling patients on how to stop cigarette smoking | | | |
| Yes | 51 (47.2) | 43 (32.6) | 94 (45.0) |
| No | 57 (52.7) | 89 (67.4) | 146 (60.0) |
| Have you had any training in how to advise smokers to stop? | | | |
| Yes | 98 (90.7) | 117 (88.6) | 215 (89.6) |
| No | 8 (8.3) | 15 (11.6) | 23 (9.8) |
| I have received formal training during medical school | | | |
| Yes | 31 (28.7) | 25 (19.0) | 56 (45.0) |
| No | 77 (71.3) | 107 (81.0) | 184(76.1) |
| I have received formal training during postgraduate education | | | |
| Yes | 15 (13.9) | 12 (9.1) | 27 (11.2) |
| No | 93 (86.0) | 120 (90.9) | 213 (88.0) |
| I have attended conferences, symposia, or workshops to receive formal training | | | |
| Yes | 29 (26.8) | 20 (15.1) | 49 (20.4) |
| No | 79 (73.0) | 112 (84.0) | 191 (78.5) |

Table 4-9 Worksite practice of smoke-free enforcement that should be implemented by the Indonesian Government

| | Physicians (%) | Dentists (%) | Total (%) |
|---|----------------|--------------|------------|
| Which one of the following do you think should be implemented by the Indonesian government? | | | |
| Prohibition of smoking in enclosed public places | 102 (94.4) | 123 (93.1) | 225 (93.7) |
| Tobacco tax rises | 99 (91.6) | 111 (84.0) | 210 (87.5) |
| Enforcement of under-age sales restrictions | 103 (95.3) | 118 (89.4) | 221 (92.3) |
| Big text health warnings on cigs packages | 95 (83.3) | 112 (79.5) | 207 (81.2) |
| Banning sport sponsorship by the tobacco industry | 96 (88.8) | 111 (84) | 207 (86.2) |
| Introducing smoking cessation services | 99 (91.6) | 111 (84) | 210 (87.5) |
| Facilitating access to smoking cessation medication | 90 (83.3) | 105 (79.5) | 195 (81.5) |
| Complete ban on tobacco advertising | 84 (77.7) | 98 (74.4) | 182(75.8) |

4.4.3. Support for smoking cessation

Table 4-11 shows survey data concerning the availability of support for smoking cessation, around 32(30%) and 50(38%) physicians and dentists (respectively) confirmed that there were no interventions available in their office to help their patients to stop smoking. Around half of physicians 55(51%) and 64(48%) of dentists said that they have self-help material and counselling. Around 16(15%) of physicians and 15(11%) of dentists said they have NRT. Around 3(3%) of physicians and 7(5%) dentists have traditional medicines in their offices. A small percentage of HPs confirmed that they have combination of counselling and NRT in their workplace or around 15 (11%) of physicians and 12(9%) of dentists. In addition, the data showed that a very small percentage (2%) of HPs have other intervention such as hypnotherapy.

In term of smoking cessation intervention that participants use (Table 4-11) around one out of three 34(31%) of physicians and one out of four 60(45%)

dentists said that they did not use any interventions to help their patients to stop. Around half of them used self-help material 54(50%) of physicians and 55(42%) of dentists. Around 13(12%) and 7(5%) of physicians and dentists (respectively) used NRT to help their patients to quit. And very small percentage 3(3%) and 4(3%), 1(1%) and 3(2%) of physicians and dentists (respectively) used traditional medicines and hypnotherapy. The most effective way to assist smokers in quitting (counselling and NRT) only used by 11(10%) of physicians and 6(5%) of dentists.

Table 4-10 The availability of support for smoking cessation,³

| Which of the following interventions available to help patients to stop smoking | Physicians n (%) | Dentists n (%) | Total N (%) |
|---|------------------|----------------|-------------|
| No intervention | 32 (30.0) | 50(38.0) | 82(34.0) |
| Self-help material | 55 (51.0) | 64 (48.0) | 119(50.0) |
| NRT | 16(15.0) | 15(11.0) | 31(13.0) |
| Counselling | 57(53.0) | 51(39.0) | 108(45.0) |
| Acupuncture | 1(1.0) | 0(0.0) | 1(0.0) |
| Traditional medicines | 3(3.0) | 7(5.0) | 10(4.0) |
| Counselling + NRT | 15(14.0) | 12(9.0) | 27(11.0) |
| Other (hypnotherapy) | 1(1.0) | 4(3.0) | 5(2.0) |

³ The table does not add up to 100%, because these are not mutually exclusive.

Table 4-11 The smoking cessation intervention that participants use

| Which of the following interventions do they use to help patients to stop smoking | Physicians n (%) | Dentists n (%) | Total N (%) |
|---|------------------|----------------|-------------|
| No intervention | 34(31.0) | 60(45.0) | 94(39.0) |
| Self-help material | 54(50.0) | 55(42.0) | 109(45.0) |
| NRT | 13(12.0) | 7(5.0) | 20(8.0)) |
| Counselling | 55(51.0) | 46(35.0) | 101(42.0) |
| Acupuncture | 0(0.0) | 1(1.0) | 1(0.0) |
| Traditional medicines | 3(3.0) | 4(3.0) | 7(3.0) |
| Counselling + NRT | 11(10.0) | 6(5.0) | 17(7.0) |
| Other (hypnotherapy) | 1(1.0) | 3(2.0) | 4(2.0) |

4.5. Discussion

4.5.1. Key findings

This study found a relatively high proportion of HPs had a history of smoking themselves, and almost one in five were current smokers. In general, HPs were aware that active and passive cigarette smoking are a cause of multiple diseases, and generally did not distinguish between the health effects of kretek and manufactured cigarettes. However, a minority were unsure about health conditions that are known to be related to smoking. The results from this study confirmed some of the findings from the qualitative study that kretek cigarettes are perceived to be strongly connected to cultural identity in Indonesia, whilst regular cigarettes have become part of the social environment in more recent years.

Overall, HPs in Indonesia feel that smoking cessation is important, and that they have a role in supporting people to quit, but they do not have adequate tools to do so e.g. in terms of training and availability of interventions. HPs were generally supportive of the government implementing effective tobacco control strategies. Both doctors and dentists are support provision of better interventions to help their patients quit.

4.5.2. Strength and Limitations

4.5.2.1. Strengths

This is the first study to provide detailed data on Indonesian HPs' perceptions about the health risks and benefits of smoking as well as their role in helping people to quit smoking. The number of participants met the minimum sample size requirement (228), and participants came from numerous provinces and major cities.

This study conducted a research using a cross sectional study design which was believed to be the most relevant study design to assess the prevalence of smoking behaviour, attitudes and knowledge of patients and health professionals. This descriptive study allowed us to provide estimates of prevalence of smoking among health professionals using a method that was relatively quick, cheap and easy to conduct. This study design also allowed us to study multiple outcomes using descriptive statistical analysis (230, 231).

4.5.2.2. Limitations

This study has some limitations. The researcher used a self-administered questionnaire, and HPs may not admit their smoking status because they feel smoking is socially disapproved of for HPs. To minimize these influences, the researcher sent the invitation through the secretary of PDGI and IDI, and the participants could complete the survey in private, with nothing to identify them.

Due to limited time factors, the scope of investigation in this research is limited to health professionals physicians and dentists only, without exploring the views of many others health professionals such as midwives, pharmacists, physiologists, chiropractors, and other health-related professionals who may have potential key roles in battling the tobacco epidemic. However, the consistency of findings between physicians and dentists suggests that challenges in relation to supporting smoking cessation are experienced across a range of health professional groups.

Although the number of participants met the minimum sample size requirement (228). For general population participants, a response rate of 20% is considered as a good response rate (232); this study only had a 16%

response rate, which increases the potential for bias and low study validity. Low response rates can result selection bias, as non-responders may be systematically different from responders. Interventions to increase survey response rates (inclusive of the general public, patients, and healthcare professionals) identified factors that enhance response rates (monetary incentives, shorter questionnaires, use of reminders and pre-notification contact) (233). To increase the response rate, this study designed questionnaires that are short, simple, and specific, and email reminders were sent to non-responding survey participants, and finally a chance to take part in a prize draw was offered for participants, but despite these measures, there was only a 16% response rate achieved for this study.

In term of study representativeness, it is likely that people with an interest in smoking, either because they are smokers themselves, or because they are strongly anti-smoking, may be more likely to take part; that could have led to either an overestimate or underestimate of the prevalence of smoking and may also influence estimates of support provided.

The researcher could not find any data on the demographics of Indonesian doctors and dentists (as a whole) such as gender, age, work location e.g. rural or very rural and so the researcher cannot be sure whether our sample is representative. For example, participation biases may have arisen because of the inability to invite the respondents who live in the rural area due to limited access to the internet. It is possible that participants were younger than the average age in the target population.

4.5.3. Comparison with previous findings

4.5.3.1. Prevalence of smoking in HPs

From the study, it can be seen that the percentage of male HPs who smoked was lower than reported for the general population, 43.4% (95% CI 32.2-54.7) and 59.9% respectively (234). The proportion of female HPs who smoked was much lower than male smokers, and similar to the general female population 7.6% (95% CI 4.0-12.8) and 2% respectively (234). Even so, smoking prevalence among Indonesian HPs 19.6% (95% CI 14.8-25.2) is high

compared to smoking prevalence among HPs in developed countries such as Australia and the UK, where only 4-8% of physicians smoke (26)

Clearly, this high prevalence of smoking in both doctors and dentists is a concern; it demonstrates that smoking is common in Indonesia, and this is even in a group who know the risks. It probably reflects the lack of support for smoking cessation and lack of implementation of effective tobacco control measures in the country.

The fact that HPs said that their patients perceived kretek to be part of the culture is in line with the qualitative findings. The qualitative study showed that, in Indonesia, there is strong influence of culture upon smoking and what is smoked.

Hanusz, writing in 2000, wrote that kretek is simply accepted as a daily activity within Indonesian people. Kretek are said to reflect Indonesian characteristics, the love of spicy and aromatic foods, and ancient custom of chewing betel (80). Our findings have demonstrated that this is even perceived to be true by health professionals, who often smoke themselves, and are therefore providing the wrong role model for their patients and for society.

The researcher know that HPs have an important role to play as role models and advisers for their patients (235-237). A starting point for changing smoking levels in the country might be to focus on supporting HPs to stop smoking, through education and treatment, as well as equipping them to support their patients to quit.

4.5.3.2. Knowledge of the health risks of kretek cigarettes

Most respondents believed that both kretek and regular cigarettes have the same harmful health effects, in particular with regard to respiratory and cardiac illnesses (e.g. lung cancer and hypertension), and stroke which is in line with our findings in chapter two (the systematic review). Our findings indicated that kretek is at least as harmful as regular cigarettes.

A significantly high percentage of HPs were unsure if either kretek or regular cigarette can cause other illnesses such as some cancers, diabetes, cataracts, and leukaemia etc.

The faculty of medicine in Indonesia should integrate information about tobacco use into their study curriculum. This should fit into the Indonesian medical council regulation issued in 2012 about Indonesia's doctor competency such as : Article 5 point 2 c (5.2.c) which states that medical doctors should be able to identify the causes of disease, especially behavioural-related illness, understand the pathogenesis of a disease connected to malnutrition, environmental and lifestyle (5.3.j), the principles of primary, secondary and tertiary health services (5.6) and disease prevention principles related to lifestyle (5.7)(238) Clearly knowledge on smoking and smoking cessation is an important aspect of this.

4.5.3.3. HPs role in relation to their patients' smoking behaviours

The HPs see their role in advising and supporting their patients to quit, but they do not feel adequately equipped and a quarter or more suggest there is not any further support available for health professional could provide.

In this study, around 71 % of physician and 81 % of dentist said that they did not get formal training during their medical study. Similar to our findings in Indonesia, a study about the role of health professionals in advancing tobacco control policy in Lao showed that only one third of health professionals (medical doctors, medical assistants, midwives, nurses and dentists) had undergone smoking cessation training and practical counselling skills during their medical education (222). Research has shown that tobacco cessation education is has also been lacking in the curriculum of most medical schools even in the UK. A study showed that 6 out of 10 of the PRHOs (pre-registration house officers) admitted that they were unable to support effective smoking cessation intervention in accordance with national guidelines (239).

A systematic review study conducted by Carson, et al. (2012) showed that HPs who have been trained on smoking cessation were more likely to perform tasks associated with smoking cessation than untrained controls ($p < 0.0001$)

(240). The odds of patients quitting smoking cigarettes were increased with the HPs access to a training programme (odds ratio 2.37 (1.43-3.92)) (241). It is clear that attention should be given to addressing the lack of smoking cessation training

This study suggests that physicians in Indonesia are more likely to give intervention than dentists. In line with this result, a previous study conducted in the USA by Agaku et al. (2014) showed that current smokers are less likely to get advice to stop smoking during their visit to the dentists (31%) than to physicians (64.8%). Our result indicated a need for strengthened efforts to better Indonesian dentists' involvement in providing smoking cessation intervention. Dentists deal with oral health and there are a number of impacts of smoking on oral health. A regular dental visit is recommended by the Ministry of Health Republic of Indonesia at least every three months for people with systemic diseases and every six months for healthy people (242), whereas healthy people do not go to see the doctor at all from year to year so there is more opportunity for dentists to intervene. In addition, studies have shown that behavioural intervention combined with oral examination in the dental office is twice as effective for smoking cessation compared with no intervention (57).

Based on the recent clinical guidelines, social behavioural intervention complemented by pharmacotherapy is the most effective way to assist people who want to quit smoking cigarette, very few people who want to stop smoking in other settings, and it is also true in Indonesia had access to this level of support (243).

This study revealed that although HPs are willing to help their patients to quit smoking, there were not enough facilities to support their intervention. Consequently, the government of Indonesia should be more aware about the need for treatments for tobacco dependence and seek to ensure the availability of smoking cessation facilities in every region.

4.6. Conclusion

The present study has identified many key points in understanding Indonesian HPs health risks perception that influence HPs smoking behaviours, as well as understanding of their perceived role in smoking behaviour.

One in five health professionals smoke, and this is much higher in men. The majority understand the risks of doing so but some are still smoking despite knowledge of the risks. This study highlighted again the strong cultural values associated with smoking in this society that are challenging to overcome. Health professionals were largely supportive of comprehensive measures and policies such as smoke-free policies that would help to change the culture.

The study also highlighted that most health professionals understood the need to ask, advice and support their patients to stop smoking, but they lacked the training and the facilities and services to provide the types of support which have been shown to be most effective in other societies.

CHAPTER 5

SUMMARY OF FINDINGS, AND RECOMMENDATIONS FOR RESEARCH AND PUBLIC HEALTH POLICY

The overall aims of this thesis were to investigate the health risks of kretek and the health risk perceptions of Indonesian people regarding their use. To understand the health risks of kretek, we first systematically synthesized and reviewed evidence from comparative studies of the following alternatives: kretek compared to regular cigarettes and kretek compared to not smoking. Secondly, to understand Indonesian people's perceptions of the health risks of kretek, this study conducted a qualitative study on Indonesian smokers and non-smokers. Finally, the researcher conducted a quantitative study of Indonesian health professionals' perceptions of the risks of kretek cigarettes, their support for tobacco control measures and their views on smoking cessation.

This chapter draws together the key findings of the systematic review study, qualitative and quantitative studies in relation to the study objectives and makes recommendations for future research and recommendations for public health in Indonesia. Together, the studies presented in this thesis provide evidence to steer policy to avoid tobacco initiation and to promote tobacco cessation in Indonesia.

5.1. Summary of findings

5.1.1. Systematic review of the health risk of kretek

In summary, considering the findings and the strengths and limitations of the included studies, the review indicated that kretek are at least as harmful as regular cigarettes.

The systematic review identified, evaluated, and summarized the findings of all relevant individual studies investigating the health effects of kretek, and concluded that kretek are associated with oral cancer, CVD, CHD, myocardial infarction, asthma and oral diseases, and that second-hand smoke exposure

is associated with melanin gingiva pigmentation. Overall, the evidence suggests that kretek has similar risks to regular cigarettes, but the quality and quantity of evidence was very limited.

5.1.2. Qualitative study of health risk perceptions of Indonesian people regarding the use of kretek

A total of 58 participants (smokers and non-smokers) participated in this study, comprising 50 males and eight females, with an age range from 17 to 75 years old. Data were analysed using thematic analysis methods.

This study showed that most participants started their smoking behaviours when they were teenagers and they continued until adult life; smoking patterns appear to be strongly defined by gender - more males smoke cigarettes; for females, smoking cigarettes is considered to be socially inappropriate (taboo), while male participants thought that smoking cigarettes has social benefits such as attracting women and the social construction of masculinity. Conversely non-smokers and women understood the health risks of smoking and second-hand smoke and wanted men to stop smoking. Women were generally aware of the health risks but lacked detailed knowledge of the health risks and benefits of stopping smoking.

Most active smokers said that they never thought about effects of smoking cigarettes on their health when they initially began to smoke, and whilst many now believed that smoking cigarettes causes shortness of breath and coughing, few were aware that smoking causes fatal illness such as cancer and lung disease. Some participants believed that the purported dangers of smoking were government propaganda.

Smokers' choice of types of cigarettes were mostly determined by the availability of specific types of cigarettes in the past, culture, and their personal preferences/ enjoyment.

Participants described kretek as being preferred by people who had more experience of smoking, and often by older people. On the other hand, participants felt that young people choose regular cigarettes because they look more fashionable. Kretek have a distinctive aroma that appeals to those who

smoke them; they are densely packed because of the tobacco cutting technique.

No ex-smokers reported having received any help from health providers when they quit smoking. Participants used diverse ways to stop smoking, including quitting cold turkey, herbal medicines, eating candy, and snacking. Moreover, fasting was found to be helpful for smokers to abstain from smoking during the month of Ramadhan, and many participants said that they would stop smoking if the Indonesian Ulema Council (Majelis Ulema Indonesia, MUI) announced that smoking is haram (prohibited).

5.1.3. Quantitative study of health professionals' perceptions of health risks or benefits of smoking and their perceived role in helping smokers to stop smoking.

This study found that 1 in 5 of doctors and dentists are current smokers, and a small group were ex-smokers. These HPs acknowledged that smoking, especially kretek, is very much part of the Indonesian culture, and viewed by their patients as a traditional remedy for illness. HPs in this study had relatively good knowledge about the health risks of cigarettes. The willingness of HPs to advise and help patients to stop smoking was quite high, but they lacked confidence in doing so, and facilities for supporting smoking cessation in their workplaces.

5.2. Summary of thesis findings

- Smoking is pervasive in Indonesia, especially among men, and it is seen as part of the culture
- Kretek cigarettes are viewed as an intrinsic part of Indonesian culture, being made and manufactured locally, but they have similar risks to regular cigarettes
- Smoking is even still pervasive among health professionals who understand the risks
- There is support for stronger tobacco control measures, and for greater activity to reduce smoking prevalence, among health professionals but also among women more generally

- However, currently there is little support to help people to stop smoking

5.3. Recommendations for public health policy

In Indonesia, where smoking is a long-established custom with many socio-cultural associations, kretek are the preferred nicotine delivery vehicle for 90% of smokers (34). In Indonesia, cigarettes account for about 70% of lung cancers, 30% of all cancers, over 70% of cases of chronic bronchitis and emphysema, and 40% of deaths from heart disease and stroke (88). In Indonesia, where kretek have been predominant, smoking cigarettes is a significant cause of oral cancer (70%) (88).

The best available evidence indicates that kretek smoking is at least as harmful as cigarette smoking, and that policymakers need to implement measures to avoid this harm.

The problems of tobacco use have been discussed by experts and organizations around the world, and recommendations have been established to prevent smoking-related disease, disability, and mortality. With around 66% of males and 6.4% of females being smokers in Indonesia (103), a comprehensive government policy is vital. Regulation must be backed up by well-monitored and strictly enforced legislation.

Indonesia is the only Southeast Asia country that has not ratified the FCTC; however, the Indonesian government has been implementing tobacco control policies corresponding to MPOWER since 2007 (100). The components of MPOWER will be used to describe what is currently being done in Indonesia and what more is needed to improve implementation of tobacco policy in the country.

5.3.1. Monitor tobacco use and prevention policies

Surveys at regular intervals are an essential part of tobacco control policy, measuring levels of tobacco use, public knowledge, and attitudes about smoking, thus supporting the evaluation of tobacco control policy, and providing evidence for the expansion and adjustment of policies. Most high-income countries have an adequate monitoring system that includes recent,

representative, and periodic surveys for their population. Overall, strong systems of monitoring tobacco use cover 40% of the world's population (36).

Based on a WHO report on monitoring the prevalence of tobacco use in 2018, Indonesia is one of the countries with highest level of achievement, along with other ASEAN countries such as Singapore, Malaysia, Brunei, Cambodia, Philippines and Thailand (36). The Indonesia National Institute of Health Research and Development (NIHRD) has regularly conducted national surveys which collect data on the prevalence of tobacco use (RISKESDAS, or Basic Health Research, 2007, 2010, 2013, 2018) (34, 90, 93, 103), and adult and youth tobacco use (Global Adult/Youth Tobacco Survey (GATS) 2011, and GYTS 2014) (4, 104). These baseline national reports on tobacco present detailed reviews of the country's tobacco problem. RISKESDAS provides comprehensive coverage of all key non-communicable disease risk factors, and provides estimates at district, provincial and national levels. RISKESDAS, GATS and GYTS collected information on the age of tobacco onset, tobacco consumption patterns, cessation attempts, exposure to second-hand smokers, and the use of e-cigarettes (4, 34, 90, 93, 103, 104). These surveys were all fully domestically funded (36).

Indonesia has started to collect data on the prevalence of tobacco use as well as youth tobacco use, however, existing surveys are relatively infrequent; at least annual surveys are desirable (32). Furthermore, these surveys do not provide any qualitative data that help to understand tobacco use in Indonesia, nor do they provide data on important groups such as HPs.

Our study results add vital knowledge about smoking behaviour and Indonesian smokers' perceptions of the health risks of kretek and regular cigarettes as well as HPs use of kretek and regular cigarettes, their knowledge of the risks associated with both types of cigarette, and the support and advice they provide to their patients. This is particularly important so that the preventive measures and health education can be tailored to address the needs and beliefs of the Indonesian population.

5.3.2. Protect people from tobacco smoke

The second measure of MPOWER is to protect people from tobacco smoke. Worldwide, only around 20% of the world's population are protected by complete smoking bans in public places, workplaces and public transport (36).

Smoking cigarettes is not only harmful for people who smoke, but also for people who involuntarily inhale cigarette smoke. There is strong, consistent evidence that passive smoking increases the risk of lung cancer, ischemic heart disease, sudden infant death syndrome, and lower respiratory disease etc. (244). Our systematic review study showed that kretek are likely to have similar effects to those of regular cigarettes and that second-hand smoking has harmful effects on oral health.

To protect people from cigarette smoke, smoke free laws must be comprehensive, a smoke free-environment that permits no-exceptions (104). The WHO report on the global tobacco epidemic showed that Indonesia has minimal smoke free laws covering only three public places (health care facilities, schools and public transport) (36). Based on Indonesia RISKESDAS in 2018, around 32.4 % (95% CI 32.1-32.7) of the population aged >10 years were exposed to cigarette smoke indoors every day, and 48.1% (95% CI 45.9-50.6) of the population aged >10 years were exposed to cigarette smoke indoors occasionally (103).

The Government of Indonesia released government regulation number 109 in 2012 that covers production, importation, distribution of cigarettes, special protection for children and pregnant women, and smoke-free zones. However, although smoke free laws exist, they are not comprehensive (105). In Indonesia not all public places having smoke free laws; universities and public transport are covered by the regulations but there is no compliance in enforcing these regulations (36). Smoke free laws do not apply in government facilities, indoor offices and workplaces, cafes, pubs or bars and restaurants (36). Bandung and Jakarta, two cities in Indonesia, are two out of 47 cities worldwide that are covered by city-level smoke free laws (40, 245).

There are many public places in Indonesia with designated smoking rooms, indicating a misconception that smoking rooms protect non-smokers from second-hand smoke (246). A study about exposure to cigarette smoke in non-smoking and smoking rooms in Indonesia's restaurants showed that both smoking and non-smoking rooms have a higher level of air containing nicotine (246). There is no safe level of exposure to cigarette smoke, so the presence of exposure to cigarette smoke can increase the health risks for children and adults (244). Studies suggested that smoke-free laws do not have a negative impact on the economy and business, including the hospitality industry (244, 247).

Furthermore, our study showed that HPs report not working in smoke-free environments, and they report having smoking rooms, which is evidence of the importance of enforcing smoke-free laws, as even health facilities currently enable smoking. A study has shown that countries which have enforced smoke-free laws are likely to reduce smoke exposure by between 80% and 90%, causing indoor air quality equivalent to ambient outdoor air (248). The Indonesian government should ban designated smoking rooms to ensure best practice-level smoke free laws (36).

Smoke free laws save lives by encouraging healthy behaviours, reducing tobacco use, and ultimately reducing morbidity and mortality caused by smoking-related diseases. Another benefit of smoke-free laws is the social norm that it creates around smoking - if young people see less people smoking, they are less likely to initiate smoking themselves (249).

Comprehensive smoke free laws should be implemented at the local and national level, and closely monitored to ensure a level of enforcement that significantly reduces exposure to second-hand smoke.

5.3.3. Offer help to quit tobacco use

To prevent morbidity and mortality due to smoking-related diseases, it is essential to prevent the uptake of tobacco and ensure a highly effective intervention is available to help people who want to quit.

Among all MPOWER measures, tobacco cessation measures are least well implemented globally, with only around 16 high-income countries, six middle-income countries and one low-middle income country offering comprehensive cessation support (36). Based on the WHO report on monitoring the prevalence of tobacco use in 2018, Indonesia has a low level of achievement with regard to tobacco dependence treatment (36).

A systematic review has suggested that a combination of specialist behavioural support combined with pharmacotherapy (e.g. NRT, Champix) is the most effective smoking cessation treatment (250). Based on WHO guidelines on appropriate cessation support, there are three key tobacco cessation priorities: affordable nicotine replacement therapy, a national toll-free quit line and tobacco cessation support in primary care facility (36).

5.3.3.1. Affordable NRT

Combining behavioural and pharmacological interventions may increase the chances of successfully quitting (39). Around 66% of the world's countries make NRTs available, however only 33% either fully or partially cover the costs (36). Pharmacological intervention including nicotine replacement, varenicline, and bupropion have demonstrated efficacy as smoking cessation aids (251).

Our study showed that only a small percentage of physicians and dentist have NRT available in their clinics. NRT has been shown to be more effective than other methods of physician-assisted cessation, so it is worth encouraging the government to be aware of this need. In Indonesia, where the price of tobacco is relatively cheap, patients may feel that the cost of NRT is relatively high. NRT is available in several pharmacies and people can purchase them without a doctor's prescription, however NRT is not covered in the national health insurance nor included as an essential drug (36). The researcher recommends the government to allocate funds or to get sponsors that can help people to obtain free pharmacotherapy smoking cessation support because support for cessation is most effective when behavioural support is combined with pharmacotherapy.

5.3.3.2. National toll-free quit smoking line

Currently, 30% of countries worldwide have a national toll-free quit smoking line in place. Around 70% of high income, 51% of middle-income and 2% of low-income countries have this cessation intervention (36). Indonesia established a telephone quit line in 2017 (36), however, the uptake and effectiveness of the Indonesian telephone quit line is not yet known.

Other than the toll-free quit line, m-Cessation (mobile phone-based smoking cessation support) has shown huge promise in a populous country such as India. M-cessation involves the use of mobile communication technology or mobile phones to offer behavioural support to people who want to quit smoking, usually for those who cannot or do not want to attend face to face support. This might involve the use of text messaging or smartphone applications (apps) (252) .

The evaluation of m-cessation program called “QuitNow” in India, suggested that among 12 502 QuitNow subscribers, around 3362 tobacco users completed the responses, 66% of current smokers had made quit attempts in period between registration and survey, 77% admitted that the programme was helpful (253). Indonesia has 355.5 million of mobile phone users (254); the m-cessation is an accessible cessation services that can reach out to users across rural and urban areas (36). To support prevention and smoking cessation, Indonesia should consider introducing a national program to strengthen and support the toll-free quit line such as m-cessation program.

5.3.3.3. Tobacco cessation support in primary care facility, hospital and specialized services

Brief advice

Brief advice by HPs is proven to be effective (36). A systematic review study showed that brief advice by the physicians increased smoking cessation rates: relative risk (RR) 1.66, 95% CI 1.42-1.94 (55).

Our quantitative study showed that physicians were willing to help and advice patients to stop smoking, but not all gave brief advice during their face-to-face consultations with them. Our study showed that HPs lack confidence in doing

this because of having limited knowledge on smoking cessation. Thus, saying they should do intervention is not enough. To ensure that HPs deliver brief advice to their patients there should be guidance documents issued by the Indonesia Department of health as a part of central information resources for the smoking cessation program.

Behavioural therapy

Apart from the availability of the quit line service, smoking cessation support in Indonesia is still limited (255). Currently, based on information from the Indonesian National Tobacco Control Committee, there are around 17 smoking cessation clinics available in Indonesia. These clinics are in Yogyakarta, Jakarta, and East Nusa Tenggara. Several hospitals in Jakarta, such the Sahid Sahirman memorial hospital, Gatot Subroto hospital and Persahabatan hospital (256, 257), are using a combination of behavioural therapy and pharmacotherapy by specialists doctors. However, other than in Jakarta, most smoking cessation clinics in Indonesia are using EFT (the Emotional freedom technique). This method is an alternative medicine method of quitting smoking that was invented by Gary Craig in 1990s. EFT is a therapy that combines both cognitive and somatic stimulation of acupressure points on the face and body. A Systematic review and meta-analysis have demonstrated its efficacy for both physiological and psychological symptoms such as anxiety, depression, and phobia. (258-262). Thus, EFT methods show promise and usefulness for smoking behaviour cessation. EFT may assist smokers to decrease the urge and cravings associated with their habit, as well as address underlying concerns related to their patterns (262).

Although smoking cessation has been integrated with primary health facilities in Surabaya and Yogyakarta, not many smokers visit the clinics (263-265). Based on the WHO guidelines for implementing cessation programmes, tobacco cessation and tobacco dependent strategies should be based on the best available evidence (36).

The need for smoking cessation training in Indonesia

All ex-smokers in our qualitative study reported having stopped smoking without any help from health professionals, and our quantitative study showed

that Indonesian HPs lacked confidence to assist patients to quit. This highlights specific training needs for health professionals to understand smoking cessation and to increase their awareness.

Our study showed that a low percentage of HPs received smoking cessation training in medical schools (28% for physicians and 18% for dentists). Smoking cessation training should be part of mandatory subjects in the medical school curriculum to ensure that HPs have access to the information and training they need to provide effective help for smokers to quit. It is very important given the high prevalence of Indonesian HPs who are themselves smokers and the cost-efficiency of smoking cessation intervention (250).

National tobacco cessation guidelines

Around 82 countries or around 42% of countries worldwide have national tobacco cessation guidelines (36). To facilitate the development of national tobacco cessation guidelines, programs can be integrated with other clinical guidelines for treating tuberculosis, cancer, cardiovascular disease, diabetes, etc.(36). Guidelines for delivery of health services have been established in some countries and delivery of tobacco cessation treatment should be one of them.

Smoking cessation guidelines need to be culturally specific, and that culturally specific cessation program has been shown to be more effective in other country. A study in the U.S suggested that higher abstinence was reported among Latino smokers after intervention using culturally modified smoking cessation program (CT) compared with those using standard cessation (SC) (266). Similar results were reported from a study of African-American smokers, with biochemically confirmed 63% quit rates for the CT group compared to 36% in the SC group (267). HPs working in different areas should appreciate local cultural influences on smoking and quitting. For example, using appropriate language, involving traditional local leaders, being mindful of specific barriers to addiction treatment, and other strategies to communicate with people can help them to become independent from their smoking addiction. This study recommends that local and national governments as well

as health and care system across Indonesia develop a tobacco cessation plan and continue to monitor the effectiveness of stop smoking support services.

5.3.4. Warn about the dangers of tobacco

5.3.4.1. Pictorial health warnings

Our qualitative study has highlighted that knowledge about the harms of tobacco use is still lacking. Pictorial health warning labels (PHWLs) have been proven to be effective to communicate the risks of tobacco use as well as the risks and the dangers of second-hand smoke (268).

There is a lack of awareness of health risks. Health warnings on cigarette packets, especially large and graphic warnings have been shown to be effective. FCTC article 11 requires members to design effective messages to communicate health risks and reduce tobacco use. To be most effective health warnings should have larger warnings with pictures and should be located at the top and both the front and back of each unit packet and package. The health warnings and message on tobacco packaging should be 50% or more, but no less than 30% of the principal display areas. In addition, article 11 of the convention also specifies that health warnings and messages should be rotated to maximise effectiveness. This can be done by setting a date after which health warnings and message content will change (269-272). Indonesian law requires that pictorial health warnings cover 40% of the two biggest sides of the packaging of all combustible tobacco products (kretek and non-kretek). Indonesia has implemented PHWLs on cigarette packages since 2014 (36, 273). Based on the WHO report on implementing the MPOWER measures in Indonesia, Indonesia has met the minimal requirement of PHWLs but could be improved (36).

Furthermore, several countries are starting to adopt plain cigarette packaging (standardized packaging) (5). Plain packaging has been proven to be effective in reducing the attractiveness of cigarette products and eliminating the misleading information on the packaging by tobacco companies (274).

All ASEAN member countries are among the countries achieving the requirements for effective tobacco health warning labels, except for Indonesia

(36). The Indonesian government needs to develop strong graphic health warnings based on WHO best-practice criteria and should consider adopting plain packaging measures.

5.3.4.2. Anti-tobacco mass media campaigns

Mass media plays an important role in changing behaviour, and media campaigns that figure smoking-related diseases have been proven to help in the prevention of smoking uptake among young people (36). Mass media campaigns are a cost-effective public health intervention to increase public awareness of health issues (275). Mass media campaigns can reach a large population, and are an important part of a comprehensive tobacco control strategy (36).

To increase awareness of the health harms of tobacco use in Indonesia, the ministry of health aired a national anti-tobacco mass media campaign entitled “Smoker’s cough” from 11-30 August 2017. The campaign was aired on four TV stations, billboards and in cinemas. While there were around 62 million smokers in Indonesia, the campaign only reached 21.5 million people via broadcast media and social media (276). Sustained campaigns with national coverage are needed to have a greater and longer-term impact on smoking behaviour (36).

Raising awareness of the dangers of smoking will increase the critical resilience of Indonesian people when they encounter misleading cigarette advertising and promotion, which is still aired on TV stations. As discussed below because surely this is one of the most important things. The Indonesian Ministry of Health and Ministry of Information should set up a sustained evidence-based mass media campaign strategy to create a maximum impact at the national level. Public education is urgently required to make sure that everyone knows that any form of cigarettes is dangerous to smokers and second-hand smokers (277).

5.3.4.3. Public education targeting young people

Our qualitative study suggested that participants started their smoking behaviour when they were young and continued their behaviour into their adult

life. Furthermore, among its neighbouring countries, Indonesia has the highest rates of smoking among young smokers aged 13-15 years, with around 35% smoking prevalence among this age group (27). There is clearly a need to educate young people to avoid uptake of smoking, and this in other contexts, school-based programmes have been shown to be effective and should be tried (278, 279).

5.3.4.4. Public education targeting women

In most developed countries women began smoking several decades after men, due to social taboos and a relative lack of personal spending power (280). This trend is similar to the current situation in Indonesia, which has recently seen a rise in female smoking rates (34, 103). The results of the qualitative study showed that males are overwhelmingly more likely to smoke cigarettes, but the low prevalence of female smokers should not be viewed with complacency. Policymakers should organize actions immediately to prevent the spread of the tobacco epidemic to the female population. Furthermore, our study showed that women do not like men smoking, this fact could be used to greater advantage to persuade men not to smoke, e.g., if women were in positions of greater power.

5.3.4.5. Public education by religious leaders

Studies conducted in neighbouring countries such as Malaysia and Thailand suggested that religion can play an important role as part of an integrated set of programmes and policies for tobacco control (281). Religious festivals and gatherings can be used as a facility to educate faith groups about the harm of smoking and encourage those who want to quit (59). Our qualitative study indicated that religion has a unique role to play in smoking behaviour in Indonesia, and Islamic organizations could shift public opinion by issuing fatwa (a formal ruling on a point of Islamic given by qualified legal scholar) on the smoking law and raising awareness that smoking is prohibited in Islam. So finally, one possibility to better education about health would be enforced bans on TAPS (Tobacco advertising, promotion, and sponsorship).

5.3.5. Enforced bans on tobacco advertising, promotion, and sponsorship

Exposure to TAPS increases the likelihood that young people initiate smoking cigarettes, which may lead to higher adult smoking rates (282, 283). A systematic review study conducted in 2011 suggested that youth non-smokers who were more aware of cigarette promotion or receptive to it, were more likely to become smokers at follow up (282).

The tobacco industry spends billions of dollars on TAPS (283). In LMICs, there has been poor regulation to protect people from TAPS, this has led to more people exposed to TAPS (242). To counter the negative effect of TAPS activities, comprehensive bans are needed as a key tobacco strategy (36).

5.3.5.1. Comprehensive bans on TAPS

Comprehensive bans on TAPS decrease tobacco use (36). Several studies have been undertaken to tackle tobacco industry tactics in Western countries with a long history of smoking. The results can be of great value for countries that are at an early stage of the tobacco epidemic, such as Indonesia. There is currently plenty of experience of how to introduce advertising bans, and how tobacco companies try to circumvent them, by creating a fear of loss of revenue in newspapers and magazines, and by scaremongering about potential negative aspects of banning cigarette advertisements.

The results of our study suggested that smoking is still very much part of normative Indonesian culture, and even many health professionals, who know the risks, nevertheless smoke. The lack of restriction on cigarette advertising in Indonesia is probably an important contributor. A study in 2009 about tobacco promotions in Indonesia suggested that tobacco industry advertising uses themes such as masculinity for adolescents (e.g. Sampoerna Hijau kretek), and culture and modernity for young adults (e.g. Djarum Black kretek) to promote their products (126) which reflects the findings of our qualitative study. Research about the economic impact of smoking suggests that the tobacco industry advertise and promote to encourage children and young adults to try tobacco, reduce the willingness of smokers to quit, increase

smokers' daily consumption, and draw ex-smokers to go back to their smoking behaviour (284).

Our study showed that men perceive smoking as being attractive to women, and it boosts their confidence, presumably because of the advertising they are exposed to. Eradicating that exposure to advertising is key. The banning of all forms of advertisements and promotions is necessary, including direct and indirect advertising, including sponsorship, whether targeted at children or at adults, and this should be a major part of the Indonesian national program. Experiences in Norway and elsewhere show that income from tobacco advertisements could be replaced by advertising other products (285).

The most persuasive argument to present to Indonesian governments for a ban on tobacco advertisements is to protect children, based on extensive evidence. Countries that ban tobacco advertising tend to show a significant fall in the rate of children smoking (270). To successfully implement effective tobacco control, the Indonesian government needs to develop national laws to enforce bans on TAPS.

5.3.6. Raising taxation

Significant results have been achieved in cutting tobacco consumption worldwide by continuously increasing the price of cigarettes through increased taxation (36). Tobacco taxation is the most inexpensive tobacco control measure that has a broad impact on reducing the number of smokers. Raising taxes by 10% will reduce consumption by 5% in low-and-middle income countries, and by 4% in high income countries (286).

Indonesian Ministry of Finance has issued Ministry of Finance Regulation (PMK) number 152/2019 about tobacco product excise tariff. This regulation took effect from January 2019. The regulation increases the average cigarette excise tariff by 23 percent for machine-made kretek cigarettes (SKM), machine-made regular cigarettes (SPM) and hand-rolled kretek cigarettes (SKT) (287).

Tobacco product excise tariffs are divided into 8 categories based on the cigarette production capacity per year, type of cigarette (machine/hand-rolled,

kretek/regular cigarette, and other tobacco products e.g klembak menyan) Kretek in general has lower excise tax compared to domestically and imported regular cigarettes, and machine-made cigarettes have higher excise tax than hand-rolled tobacco products (287). Currently, kretek and other traditional cigarettes have a lower excise tax than regular cigarettes, because the former are considered to be an indigenous Indonesian product, similar to traditional medicines (126).

Imported and domestically produced regular cigarettes that have a retail price of Rp. 1790 (USD 0.13) have an excise tax of Rp. 790 (USD 0.056) per cigarette (tax increased 26.4 % from Rp. 625 in 2018). Cigarettes group one (cigarette that produce in Indonesia and the production is more than 3 billion cigarettes per year) that has retail price of 1700 has excise tax of Rp. 740 per cigarette (the tax excise increased 25.42% from Rp.590 in 2018). The lower excise tax is subject to kretek cigarette hand rolled that produced less than 10 million cigarette per year or Rp. 110 (USD 0.0079) per cigarette and lastly, cigarette *klembak menyan* and that has retail price of Rp. 200 (USD 0.014) has an excise tax of Rp. 25 (USD 0.0018) per cigarette (287). Increasing tax should increase the price of cigarettes but it depends on whether smokers are able to access cheaper brands. Price differentials need to be eradicated to reduce opportunities for downtrading.

Kretek cigarettes are essentially inexpensive, depending on the brand, the price of a packet of 12 or 16 cigarettes ranges from Rp. 13,000 to Rp. 30,800 (approximately USD 0.85-2.02). Kretek cigarettes can also be bought individually; a single cigarette can be purchased for around Rp. 1000 (USD 0.066), and approximately 30 percent of sales by Sampoerna companies are in single cigarette sales. (288-290) In addition to raising tobacco taxation, the government should prohibit warungs (small supermarkets) from selling individual cigarettes, only allowing sale in packages. Currently, even primary-school children aged 7-12 years can afford to buy cigarettes, as the daily allowance of those students averages at Rp. 10,000 (USD 0.66), which is sufficient to buy seven to ten cigarettes (289).

Indonesia's tax revenue for tobacco excise in 2019 was Rp. 165.5 billion (USD 10.9 million) (111) and there were 6.1 million workers directly and indirectly working for the tobacco industry, including 2 million tobacco farmers, 1.5 million clove farmers, 600,000 workers at cigarette factories, 1 million cigarette retailers, and 1 million workers in printing and cigarette advertising (87). However, the loss due to smoking-related diseases in total, in 2013 was Rp. 378.75 trillion (USD 24.9 billion). This significantly exceeds the tax income from cigarettes, which is Rp. 103.02 trillion (USD 6,7 billion) (88).

Our qualitative study showed that participants were willing to quit smoking if the price of cigarettes was higher than they could afford. The Indonesian government needs to increase their excise taxes further to minimise the price differential between kretek and regular cigarettes, and keep pace with increases in per capita income, which will have the effect of making cigarettes less affordable.

5.3.7. Measures relating to the reduction of the supply of tobacco

5.3.7.1. Restriction on cigarette sales to minors

The association between a ban on sales to minors and youth smokers has been explored in many research studies. A systematic review study suggested that when a ban on sales to minors is strongly enforced, minors faced difficulties in accessing cigarettes, which may reduce cigarette consumption (291).

Indonesia government regulation number 109/2012 controls the distribution of tobacco cigarettes; for example, it is prohibited to sell cigarettes using a vending machine, or to sell tobacco cigarettes to minors (aged 18 years old or under) and pregnant women (105). However, a recent study by Astuti et al showed that this regulation was not fully implemented. This study, conducted in Bali in 2019, investigated cigarette retailers' density and retailer proximity to schools based on geographical mapping. The results showed that 57% of retailers within a 250 m radius of a school admitted selling cigarettes to young people. The study concluded that unregulated retailer settings in Indonesia enable commonplace selling by cigarette retailers to young people (109). The qualitative research presented in this thesis found that most smokers began

smoking cigarettes when they were school aged and maintained such behaviours into adult life. Participants in the study admitted that when they were young, they bought individual cigarettes, due to the small pocket money they had.

Fines for selling cigarettes to minors should be implemented. A minimum age of 18 years should be in place for the sale of tobacco, and vendors should have warning signs to show that tobacco will not be sold to minors. There are clearly areas of implementation and enforcement of FCTC which are needed urgently to start to impact on smoking prevalence and to reduce the harm.

5.3.7.2. Application of policy context

As discussed above concerning the smoking situation in Indonesia, based on our findings, it is clear that there is a need to have urgent intervention to address the prolific smoking behaviour amongst Indonesian people. Smoking cessation interventions are commonly influenced by theories of behavioural change, including the Trans-Theoretical Model (often referred to the Stages of Change model) (292), the Health Belief Model (293). and/ or Social Cognitive/ Learning Theory (294). Key aspects of the various models include a focus on the importance of motivation, self-efficacy, consideration of barriers and benefits to change, subjective norms and attitudes, and cues to action (292-294).

There are many theoretical paradigms that can be used to discuss smoking cessation behaviour (295), but none of those theories has thoroughly discussed the causes by which people quit smoking, and quitting smoking behaviour patterns, other than the PRIME theory of motivation (293). This has been widely used to discuss addictive behaviour and smoking cessation (296), but in Indonesia there has not been much research on smoking cessation in any form (297). PRIME theory considers cigarette addiction to be a disorder of motivation, and it seeks, through a conceptualization of smokers' plans, responses, impulses, motives, and evaluations, to help practitioners understand what they can do to help patients/ clients overcome their addiction (298), therefore PRIME theory is considered appropriate as a basis for research and analysis to discuss the motivation to quit smoking.

Based on this study's findings, Indonesian HPs are latently willing to help smokers to quit, and advice from HPs is likely to increase the chance of smokers to quit. Linked to the above, it is important to have behavioural interventions that take the form of advice, discussion, encouragement, and other activities designed to help quit attempts succeed (299, 300). Interventions generally employ behavioural change techniques, addressing factors such as self-efficacy and motivation (often using motivational interviewing techniques) (300, 301). Our study showed that socio-cultural factors in Indonesia create a milieu whereby men predominantly smoke, while women want men to quit smoking; this in itself can be an important source of motivation and support for men who want to quit. Enhancing motivation is an important part of the overall treatment for tobacco addiction as it increases smokers' enthusiasm, sense of purpose, and will to quit (302) Interventions may also seek to maximize self-regulatory capacity and skills (e.g. strategies for reducing exposure to smoking cues), and include adjuvant activities, such as giving advice on pharmacotherapy and encouraging social support (e.g. among group members or from family). Interventions should be tailored to individual need, where feasible (300).

5.4. Recommendations for future study

This research undertook a systematic review to investigate the health risks of kretek, but the results are limited by the low availability of pertinent high-quality studies to review. This study proposes more empirical studies of the particular health risks of kretek, using large and representative study populations; this would shed light on the specific health concerns of kretek for individuals, and on kretek-related illnesses affecting society.

The qualitative study suggested that male participants thought that smoking cigarettes has social benefits such as attracting women and the social construction of masculinity. The tobacco industry has managed to establish identity for its products and to normalize smoking kretek as part of Indonesian culture (126).

Research is needed to design a comprehensive tobacco counter marketing program that is suitable for the Indonesian culture, such as our study result that showed the fact that women do not like men smoking.

Our study suggested that Indonesian physicians still commonly smoke; HPs and influential community figures such as teachers and religious leaders are likely to be important in setting a positive social example, but the ongoing presence of tobacco advertising and a lack of restrictions is likely to continue to propagate positive messages about smoking, particularly to young people. There was limited availability of tobacco control research in Indonesia, and more research is needed to try to implement evidence-based policies and initiatives and to evaluate how well they have been implemented and how effective each has been, overall and in specific groups.

Our study found evidence of a lack of training regarding smoking cessation among physicians and dentists. Smoking-related training is only offered for physicians in some medical schools in Indonesia, and the curriculum is not as comprehensive as equivalent provision in developed countries (303)

The quantitative study in this thesis showed that HPs do not have adequate tools or training to help their patients to stop smoking. For that reason, this study recommends further cross-sectional studies with large populations of midwives, nurses, physiotherapists, physicians, dentists, and other Indonesian health professionals to understand the specific smoking cessation training needed for HPs in Indonesia. Training needs to be added to curriculum of all health professional training and there needs to be research to ensure that is happening and that is effective in meeting the training needs.

This study showed that there is limited support available for physicians to help their patients to stop smoking, and some investment and subsidy (e.g., of NRTs) is required to address this. More clear direction is needed in the attitudes and priorities of government and public health figureheads regarding smoking.

5.5. Conclusion

The results of the studies contained in this thesis indicate that Indonesia is in the early phase of a smoking epidemic, with a large number of male smokers. People believe that smoking kretek or regular cigarettes has many benefits and continue to smoke. For those seeking to quit, there is a lack of facilitation for smoking cessation (e.g., pharmacological and behavioural support). Many HPs who should be role models are smoking themselves, while others are not confident to deliver smoking cessation support and advice to their patients because of a lack of knowledge and facilities.

There is a need for improved training to increase confidence and skill among HPs, and need for better technologies to support cessation, along with improved access to evidence-based pharmacotherapies. Regulation should be implemented to limit people's access to cigarettes. Through better regulation, tobacco advertising and the selling of tobacco to youth should be banned. The most important issue is to cut the initiation of cigarette use among young people.

Indonesia is the only ASEAN country that has yet to ratify the WHO Framework Convention on Tobacco Control (FCTC). This is mainly because of economic factors expressed as strong opposition from its agriculture, trade, and finance ministries, as the tobacco industry is a major source of national employment and revenue, aside from actual lobbying by the industry itself (30, 86).

Indonesia has minimal smoke-free policy, cessation programs, health warnings, and advertising bans, and cigarettes remain relatively affordable. There is a need to have regulation on advertising bans, providing support for smokers who want to stop smoking, as well as support for health professionals smoking cessation training. Indonesia needs a comprehensive tobacco policy, and it must enforce that policy, compliant with the MPOWER measures proposed by the WHO.

Smoking is very common in Indonesia. Our study has added considerably to what previously known. Smoking is a major problem in Indonesia and there is clearly a need for government action and more research.

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APPENDIX 1: PECOS STUDY DESIGN)

| | |
|---|---|
| P: Population | Human |
| E: Exposure | Did the study look at the following exposure: kretek, specific kretek use, kretek risk factors: smoking-related disease, passive smoking affect (pregnancy, children, etc.) More specifically, does the study include toxicity of kretek cigarette? |
| C: Comparison, control, or comparator | Current kretek smokers with non-smokers, current kretek smokers with regular cigarettes smokers, non-smokers who are passively exposed to kretek cigarettes, non-smokers who are not exposed or non-smokers exposed to regular cigarettes. |
| O: Outcome (health outcome/ risk/ toxicity) | Long term effects Short term effects Benefits for health of the use and exposure of kretek cigarettes Physical and mental health or health related outcome |
| S: Study design | We included (if any) current systematic review studies, comparative longitudinal or cohort studies which have assessed the health risk associated with kretek cigarettes. We also included case control and cross-sectional studies. We excluded animal research. |

APPENDIX 2: SEARCH TERMS

EMBASE and ASSIA: Kretek* OR rokok*OR Merokok* OR (Clove OR Eugnoi* adj2 (cigar* OR smok* OR Inhal*)).mp

PubMED : Kretek* OR rokok*OR Merokok* OR (Clove OR Eugnoi* adj2 (cigar* OR smok* OR Inhal*))

Scopus: Kretek OR Clove cigar* OR Rokok

Google scholar : “kretek OR Clove cigar OR Rokok*” to fill in the field “with all of the words”, “kretek OR Clove cigarette OR Rokok OR Merokok OR Asap Rokok to fill in the field “with at least one of the words”.

National Library of Indonesia: Rokok, Kretek, Rokok kretek, Merokok, Asap rokok, paparan rokok, rokok Indonesia, Rokok tradisional.

WHO, ASH UK, ASH US, NIH, CDC: Kretek OR Clove cigarette(s)

Medical journals in Indonesia: Rokok, Rokok kretek, Merokok, Asap rokok, paparan rokok, rokok Indonesia, Rokok tradisional.

APPENDIX 3: NEWCASTLE-OTTAWA QUALITY ASSESSMENT SCALE

Newcastle-Ottawa quality assessment scale for case control studies

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Exposure categories. A maximum of two stars can be given for Comparability.

Selection

1) Is the case definition adequate?

a) yes, with independent validation *

b) yes, e.g. record linkage or based on self-reports *

c) no description

2) Representativeness of the cases

a) consecutive or obviously representative series of cases *

b) potential for selection biases or not stated

3) Selection of Controls

a) community controls *

b) hospital controls

c) no description

4) Definition of Controls

a) no history of disease (endpoint) *

b) no description of source

Comparability

1) Comparability of cases and controls on the basis of the design or analysis

a) study controls for (Select the most important factor) *

b) study controls for any additional factor *

(This criterion could be modified to indicate specific control for a second important factor)

Exposure

1). Ascertainment

a) secure record (e.g. surgical records) *

b) structured interview where blind to case/control status *

c) interview not blinded to case/control status

d) written self-report or medical record only

e) no description

2) Same method of ascertainment for cases and controls

a) yes *

b) no

3) Non-Response rate

a) same rate for both groups *

b) non respondents described

c) rate different and no designation

APPENDIX 4: NEWCASTLE-OTTAWA QUALITY ASSESSMENT SCALE (ADAPTED FOR CROSS-SECTIONAL STUDIES)

PA Modesti et al.

Panethnic differences in blood pressure in europe: a systematic review and meta-analysis.

S1 Text

Selection: (Maximum 5 stars)

1) Representativeness of the sample:

- a) Truly representative of the average in the target population. * (all subjects or random sampling)
- b) Somewhat representative of the average in the target population. * (non-random sampling)
- c) Selected group of users.
- d) No description of the sampling strategy.

2) Sample size:

- a) Justified and satisfactory. *
- b) Not justified.

3) Non-respondents:

- a) Comparability between respondents and non-respondents' characteristics is established, and the response rate is satisfactory. *
- b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory.

c) No description of the response rate or the characteristics of responders and non-responders.

4) Ascertainment of the exposure (risk factor):

a) Validated measurement tool. **

b) Non-validated measurement tool, but the tool is available or described. *

c) No description of the measurement tool.

Comparability: (Maximum 2 stars)

1) The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled.

a) The study controls for the most important factor (select one). *

b) The study control for any additional factor. *

Outcome: (Maximum 3 stars)

1) Assessment of the outcome:

a) Independent blind assessment. **

b) Record linkage. **

c) Self report. *

d) No description.

2) Statistical test:

a) The statistical test used to analyse the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). *

b) The statistical test is not appropriate, not described, or incomplete.

APPENDIX 5: QUALITY ASSESSMENT TABLE

| Quality Aspects | Study | | |
|--|-------|---|---|
| | A | B | C |
| Selection criteria | | | |
| Adequate case definition | | | |
| Consecutive or obviously representativeness | | | |
| Selection of controls | | | |
| Definition control | | | |
| Comparability | | | |
| Adjusted for other controlled factors (i.e. alcohol consumption) | | | |
| Adjusted for age | | | |
| Exposure | | | |
| Ascertainment of exposure | | | |
| Same method for cases and control | | | |
| Response rate $\geq 70\%$ | | | |

APPENDIX 6: QUALITATIVE INTERVIEWS - SMOKERS

Telephone Interview Questions for Smokers

Introduction

- Explain to participant that they are being contacted as they previously spoke to me in the municipal office and gave informed consent allowing me to contact them to speak about smoking.
- Ask the participant if it is convenient to conduct the interview at present or would they prefer a call back at a more suitable time.
- Before the interview, ask the participant if they have read/been verbally informed of the information sheet provided at the time of recruitment and ask if they understand why they have been contacted and what their role in this study is.
- Check participant is still willing to take a part and obtain verbal consent
- Opportunity for the participant to ask any questions
- Explain the interview is expected to last approximately 30 minutes.
- Explain the participant does not have to answer any question they may find distressing.
- Reconfirm confidentiality process and how the information will be used.

I would like to reassure you that all information about you will be handled in confidence. The audio recording will be stored safely, all the data will be anonymous and given a research code, known only to the researcher. Your participation is entirely voluntary, and you are free to withdraw at any stage without giving a reason. Thank you for agreeing to take part in this study.

Background/ smoking history

To understand cigarette smoker's use

Can you tell me a little bit about your smoking history?

At what age did you start smoking cigarette?

What kind of cigarette did you try the first time?

Why did you choose that type of cigarette?

Do you currently smoke kretek cigarettes or regular cigarettes or both?

Why do you smoke that product?

How many cigarettes do you smoke per day/per week?

Cigarette smokers' knowledge and attitudes about the benefits and harms of kretek/ regular cigarettes

Do you feel like you experience any benefits as a result of your smoking? Do you think the benefits are the same for all types of cigarettes? (Probe if needed: Ask about kretek vs. regular cigarette)

Can you tell me a bit about any drawbacks of smoking that you have experienced or that you are aware of? Do you think the drawbacks are the same for all types of cigarettes? (Probe if needed: Ask about kretek vs. regular cigarette)

When you decided to smoke your current type of cigarette, did you think about the harms or benefits of that type of cigarette? Which harms/benefits did you consider?

Can you tell me a bit about what your family/friends think about your smoking habits? Are they a smoker themselves? Do they smoke the same type of cigarettes?

Can you tell me a bit about anything that influences you to smoke cigarette? (Probes if needed: somebody (your family/friends) or something (advertisements, price of cigarette, availability)?)

Can you please tell me a bit about your favourite place to smoke? Do you mostly smoke indoors or outdoors?

In your opinion, should people worry about exposing their children to cigarette smoke? Why? Do you think that is the case for all types of cigarettes? (Probe if needed: Ask about kretek vs. regular cigarette)

To understand smoker's attempts to quit

Have you ever tried to quit smoking cigarette?

Why did you try to quit smoking?

Did you find it difficult to stop smoking?

How did you try to stop smoking? Did anyone help you and if so who?

How long did you stop smoking for?

Why did you start smoking again?

Do you think you will try to stop smoking again?

When and why?

If not, why not?

If not, would anything make you consider quitting?

APPENDIX 7: QUALITATIVE INTERVIEWS - NON-SMOKERS

Telephone Interview Questions for Smokers

Introduction

- Explain to participant they are being contacted as they previously spoke to me in the municipal office and gave informed consent allowing me to contact them to speak about their perceptions as a friend/relative of current kretek and non-kretek smokers.
- Ask the participant if it is convenient to conduct the interview at present or would they prefer a call back at a more suitable time.
- Before the interview ask the participant if they have read/been verbally informed of the information sheet provided at the time of recruitment to the study and ask if they understand why they have been contacted and what their role in this study is.
- Ensure consent form has been signed and check participant is still willing to take a part and obtain verbal consent.
- Opportunity for the participant to ask any questions
- Explain the interview is expected to last approximately 30 minutes.
- Explain the participant does not have to answer any question they may find distressing.
- Reconfirm confidentiality process and how the information will be used.

I would like to reassure you that all information about you will be handled in confidence. The audio recording will be stored safely, all the data will be anonymous and given a research code, known only to the researcher. Your participation is entirely voluntary, and you are free to withdraw at any stage without giving a reason.

The attitudes of non-smokers to the use of kretek or non-kretek cigarettes by family or friends

1. Could you please tell me how many friends/relatives you have who are current smokers? What is your relationship to them? Friends or family?
2. What do they (friends/family) usually smoke - kretek or regular cigarettes?
3. From what you can remember, have they ever tried to quit? Why do you think they want/wanted to quit? How did they try to quit? (Probe if needed – with professional support, NRT etc)
4. What are the barriers, if any, that your friend/family encountered during their quit attempt? If they stopped smoking, are they happy about their success?
5. Have you ever discussed smoking with your family/friend who is a current smoking? (probe what did you talk about?)

The concerns of non-smokers to the use of kretek cigarettes by family or friends

Non-smokers' opinion about their family/friends' perception of smoking behaviours

6. Why do you think your family/friends smoke cigarettes? Is it fair to say that those reasons also apply to kretek and regular cigarettes? Or is there any difference? (Probe: Please explain)
7. Do you think your family/friends think there are any benefits to smoking cigarette? Is it fair to say your friend/family think that both kretek and regular cigarette have the same benefits? (Probe: Please explain)
8. Do you think your friends/family who smoke are aware of any negative consequences? Is it fair to say that applies to both kretek and regular cigarettes?

Non-smokers' opinions about smoking cigarette behaviours

9. Do you think your family/friends who are smokers get any benefits from smoking? Do you think there is any difference between different types of cigarettes?
10. Do you think smoking has any harmful effects on the smoker? Are you concerned about your family/friend's smoking? Do you think there is any difference between different types of cigarettes?

The concerns of non-smokers to the health risks or benefits associated with passive smokers

11. Are you aware of any harmful effects of smoking non-smokers?
12. Have you ever experienced any health effects/illness as a result of your family/friend's smoking? Do you think that's true for all types of cigarettes (kretek/regular cigarettes)?
13. Can you tell me a bit about where your friends and family tend to smoke? Do they mostly smoke indoors or outdoors? (probe: Could you say some more about the reason why they choose indoors or outdoors, is it true for both kretek and regular cigarettes?)
14. Do they have children? Do you think they worry about exposure of their children? Why? (probe about kretek and regular cigarettes)
15. What do they (your friends / family) think should be done to protect non-smokers around them? (probe if they think there is any difference between kretek and regular cigarettes)

APPENDIX 8: CONSENT FORM - QUALITATIVE INTERVIEWS

Title of Study: A mixed methods investigation into the behaviours, attitudes and health risk perceptions of the Indonesian population regarding kretek cigarettes

Researcher's Name : Desy Nuryunarsih, DDS, MPH

Supervisor's Name : Prof. Sarah Lewis

Supervisor's Name : DR. Tessa Langley

REC ref: (to be added after approval given)

I, the undersigned, confirm that (please tick box as appropriate):

| | | |
|----|---|--------------------------|
| 1. | I confirm that I have read and understood the information about the project, as provided in the information sheet dated | <input type="checkbox"/> |
| 2. | I have given the opportunity to ask questions about the project and my participation. | <input type="checkbox"/> |
| 3. | I understand that my participation is voluntary, and I am free to withdraw at any time, without giving any reason. The information collected so far can be erased if I wish. | <input type="checkbox"/> |
| 4. | The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymization of data, etc.) to me | <input type="checkbox"/> |
| 5. | I understand that relevant sections of my data collected in the study may be looked at by the other researchers only if they agree to preserve the confidentiality of the data. I give permission for these individuals to have access to these records and to collect, store, analyses and publish information obtained from my participation in this study. | <input type="checkbox"/> |

| | | |
|----|---|--------------------------|
| 6. | I understand that the interview will be audio recorded using a digital recorder and the anonymous direct quotes from the interview may be used in the study reports. | <input type="checkbox"/> |
| 7. | I understand that information about me recorded during study will kept in a secure database. If data is transferred it will be made anonymous. Data will be kept for 4 years after the study has ended and then securely destroyed. | <input type="checkbox"/> |
| 8. | I agree to take part in the above study. | <input type="checkbox"/> |

Participant:

Name of participant

Signature

Date

Contact detail researcher:

Email: Desy.nuryunarsih@nottingham.ac.uk

The contact details of the Research Ethics Coordinator should participants wish to make a complaint on ethical grounds are:
louise.sabir@nottingham.ac.uk

APPENDIX 9: PARTICIPANT INFORMATION SHEET - QUALITATIVE INTERVIEWS

Study Title: A mixed methods investigation into the behaviours, attitudes and health risk perceptions of the Indonesian population regarding kretek cigarettes

Name of Researcher: Desy Nuryunarsih

I would like to invite you to take part in a research study. Before you decide whether to take part, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or you would like more information. Take some time to decide whether or not to take part.

What is the purpose of the study?

In Indonesia, 36% of people smoke, and 90% of current smokers or around 50 million people smoke kretek cigarettes. Little is known about why people smoke and why they smoke kretek cigarettes in particular. The aim of this study is to gain a better understanding of the role of kretek cigarettes in the lives of Indonesian people, including their perceptions of the health risks and benefits in smokers and non-smokers. This research is part of a PhD study conducted and supervised at The University of Nottingham, UK.

Why have I been invited?

You are being invited to take part because you are current smoker, or you have family or a friend who is a current smoker. In this study, I am inviting current smokers and non-smokers in Bandung, Jakarta, and Bekasi to take part.

Do I have to take a part?

It is up to you to decide. I will describe the study and I will ask you to sign a consent form to show you agree to take part, and you are still free to withdraw at any time, without giving a reason.

What will happen to me if I take a part?

If you agree to take a part, I will ask you to sign a consent form. I will then contact you by telephone at an agreed time. Then I will ask you if you are still willing to take a part. The interview will take no more than 30 minutes over the telephone. If that time is no longer convenient, we can rearrange the interview for another time. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals.

What are the possible disadvantages and risks of taking part?

There are no foreseeable disadvantages or risks of taking part in this study.

What are the possible benefits of taking part?

I cannot promise the study will help you but the information I get from the study will help to increase our understanding of the perception of health risks among current smokers and people who have family or friends who are current smokers. This will help in ensuring smokers know about the health risks and in finding ways to help them to stop smoking if they want to do so. If you complete an interview you will receive a 160,000 IDR (around 10 GBP) mobile voucher, which we will send directly to your mobile phone.

What if there is a problem?

If you have a concern about any aspect of this study, please contact me and I will do my best to answer your questions. If you remain unhappy and wish to complain formally you can do this through email to:

louis.sabir@nottingham.ac.uk.

Will my taking part in the study be kept confidential?

All information about you will be handled in confidence. The recording of the interview will be stored safely, and when it is transcribed any information that identifies you will be removed. A master list identifying participants to the research codes data will be held on a password protected computer accessed only by me.

What will happen if I don't carry on with the study?

You can withdraw from the study at any time. Information previously collected may still be used. However, any stored taped interviews that can still be identified as yours will be destroyed if you wish.

What will happen to the results of the research study?

The information obtained from the study will be written up in my thesis and for publication in a peer reviewed journal. You will not be identified in any report/publication.

Who is organizing and funding the research?

This research is being organized by the University of Nottingham and is fully self-funded by me.

Further information and contact details:

Desy Nuryunarsih Email: Desy.nuryunarsih@nottingham.ac.uk

Phone: +44 07599688972, +62 85781989697

APPENDIX 10: DRAFT THEMES QUALITATIVE STUDY SAMPLE

Themes 1

Incentives and pressures Patterns and influences on uptake.

This theme reflects the motivation of Indonesian smokers to take up cigarettes.

Subtheme 1: Influence of other smokers

- Pressure from friends
- Share cigarettes
- Get cigarettes from family
- Tends to start smoking when they are in high school

Themes 2: Patterns of smoking behaviour.

Pattern of smoking cigarette in Indonesia

This theme reflects the pattern of smoking behaviour in Indonesia: who (gender, age), why, what, how much and where they usually smoke cigarette.

Subtheme 1: Pattern of smoking behaviour in Indonesia

- Who smokes cigarette (Gender, age) – male dominated
- Mix of preferences for kretek vs white cigarettes
- Location of smoking
- Availability of kretek in the past
- How many cigarette they consumed

Themes 3: Perceived benefits of smoking

This theme refers to the benefit that people get from cigarette use, it is not only smokers experience use but also about the general thought about the benefits of tobacco use.

Subtheme 1: Emotional benefits

- Socializing
- Relieves boredom
- Improves alertness
- Calm/relaxation
- Smoking slowly likened to prayer
- A need/ routine
- Improve confidence

Subtheme 2: Perceived influence on masculinity/attractiveness

- Masculinity and attractive girls

LS

Lewis Sarah

Not sure incentives is the right word – I'd go for patterns and influences on uptake?

LS

Lewis Sarah

Not sure you need a subtheme for this – I would only use subthemes where there is more than 1 theme under a heading.

LS

Lewis Sarah

Again, subtheme not needed.

LS

Lewis Sarah

I think this would improve if it said a little more about what the data says – eg male dominated mix of preferences for kretek vs white cigarettes

T

TLangley

Need to be clear about whether it's tobacco in general or only cigarettes

T

TLangley

Not sure 'emotional' is the right word.

LS

Lewis Sarah

this is important and I wonder if it deserves a different subtheme – perceived influence on

APPENDIX 11: DRAFT THEMES WITH QUOTES - QUALITATIVE STUDY SAMPLE

| Themes 1 | |
|--|---|
| <p>Incentives and pressures for uptake</p> <p>This theme reflects the motivation of Indonesian smokers to start smoking cigarette, how, why, where and when they get cigarettes for the first time, appeal of taking cigarette and the reason for them to choose their first cigarette type or change them.</p> | |
| Subtheme 1: Influence of other smokers | |
| <ul style="list-style-type: none"> Pressure from friends | <ul style="list-style-type: none"> <i>If I go out with my friends, I always want to smoke cigarette. A2B 23 female smoker</i> <i>I just got influenced by my friends, when we hang out together outdoors <u>usually</u> we smoke cigarettes. A3B 42 female non-smoker</i> <i>I don't smoke cigarette except if I go out with my friends A6B 19 Male Smoker</i> <i>I was only following my friends, because I don't want to feel left out, so I started to smoke cigarette A10B 40 Male smoker</i> <i>I want to quit smoking cigarette, but I don't think I will be able to do so, because I am still live with my friends who are smokers A10B 40 male smoker</i> |
| <ul style="list-style-type: none"> Share cigarettes | <ul style="list-style-type: none"> <i>At first, I asked my friends for cigarettes, but later, I bought cigarettes myself A6B 19 Male Smoker</i> <i>I feel weak if I <u>don't</u> smoke cigarette, and then I always ask my friend to give me cigarette if I <u>don't</u> have money for buying cigarette. A17B 70 male smoker</i> <i>What type of cigarette did you first consume? I smoke Gudang Garam cigarette, because of my friend, he always brought Gudang Garam with him, and he share his cigarette with me. It was when we were a high school student, but then when I was a university student I didn't meet him anymore, and then I changed to <u>other</u> cigarette brand, it was <u>Djarum Super</u>. A16D 53 male smoker</i> <i>When I first try smoking cigarettes, I never buy cigarettes, because my friends offer me cigarettes, but then I got headache because I keep on changing my cigarettes types and brands then I bought cigarette for myself, one of my friend smoke <u>Sampoerna Mild</u>, I tried that and I like it, then I bought it and I smoke that cigarette till now. A2J 75 male smoker</i> <i>I never using my monthly salary for buying cigarette, I buy cigarette using money from my side job, or get from my friends. God will give us money depend on our need, so even the cigarette price is increasing but we will still afford to buy cigarette because God will give us the money. A7J 52 male smoker</i> |

LS

Lewis Sarah

Overall important messages here but currently a bit fragmented – need to work out what the important messages are and possibly restructure so less repetitive and more focusses on novel themes which seem to be:

Men smoke because they believe attracts girls
 Women are very aware of health effects eg on children and don't like smoking
 Religion is an important part of life and if religious leaders were opponents smoke would stop
 Decisions on kretek versus white – generational / style / perceived differences in risk
 Tobacco and economy
 There is policy eg smokefree but not well enforced

LS

Lewis Sarah

This theme is important but I guess not that novel. People take up smoking in the teenage years because of peer pressure and role model of family.

APPENDIX 12: LIST OF IDI AND UDI SECRETARIES' CONTACT EMAIL ADDRESSES

IDI cabang 1

Aceh, Sumatera Utara, Sumatera Barat. Riau dan Jambi

<http://www.idionline.org/acxbout/daftar-idi-cabang/daftar-cabang-1/>

IDI cabang 2

Wilayah Sulawesi Selatan, Lampung, Bengkulu, Bangka Belitung

<http://www.idionline.org/about/daftar-idi-cabang/daftar-cabang-2/>

Cabang 3

DKI Jakarta, Jawa Barat, Jawa Tengah, Yogyakarta, Jawa Timur

<http://www.idionline.org/about/daftar-idi-cabang/daftar-cabang-3/>

Cabang 4

Banten, Kalimantan Barat, Kalimantan Tengah, Kalimantan Selatan, Kalimantan Timur (Balikpapan)

<http://www.idionline.org/berita-lengkap/daftar-cabang-4/>

Cabang 5

Sulawesi Utara, Sulawesi Tengah, Sulawesi Selatan, Sulawesi Tenggara, Gorontalo

<http://www.idionline.org/about/daftar-idi-cabang/daftar-cabang-5/>

Cabang 6

Bali, Nusa Tenggara Barat, Nusa Tenggara Timur, Maluku, Maluku Utara

<http://www.idionline.org/about/daftar-idi-cabang/daftar-cabang-6/>

Irian Jaya, Papua Barat

<http://www.idionline.org/about/daftar-idi-cabang/daftar-cabang-7/>

PDGI

DKI Jakarta, Jawa Barat, Jawa Tengah, Jawa Timur

http://pdgi.or.id/?page_id=146

http://pdgi.or.id/?page_id=133

http://pdgi.or.id/?page_id=142

http://pdgi.or.id/?page_id=144

PDGI Kalimantan Timur, Kalimantan Tengah

<http://pdgibalikpapan.org/>

http://pdgi.or.id/?page_id=153

PDGI Sulawesi Selatan, Sulawesi Tengah

http://pdgi.or.id/?page_id=201

http://pdgi.or.id/?page_id=551

PDGI Papua/ Irian Jaya

http://pdgi.or.id/?page_id=561

PDGI Sumatera Barat

<https://pdgipadang.or.id/>

PDGI Aceh

http://pdgi.or.id/?page_id=240

APPENDIX 13: QUANTITATIVE WEB-BASED STUDY - EMAIL PARTICIPATION INVITATION TO HEALTH CARE PROVIDERS

Dear Colleague

I am writing to invite you to participate in a research survey entitled: A mixed methods investigation into the behaviour, attitudes and health risk perceptions of the Indonesian population regarding kretek cigarettes. As a health professional, you are in an ideal position to give me valuable first-hand information from your own perspective.

My name is Desy Nuryunarsih, I am conducting a web-based survey as part of my PhD research study in the School of Medicine, Division of Epidemiology and Public Health, University of Nottingham UK. The research study aims to understand the views and perceptions of health professionals in Indonesia in relation to smoking, and in particular to the smoking of kretek cigarettes.

Your participation in the survey is completely voluntary and all of your responses will be kept confidential. The survey takes around 10 minutes to finish. I would be very grateful if you would participate in this study as it will help us to understand the knowledge and attitudes of health professionals with regard to different types of smoking behaviour.

To thank you for doing so, I am offering a chance to take part in a prize draw of 1 Carrefour shopping voucher worth 1.5 million IDR or 100 GBP for 1 lucky participant. The winner of the Carrefour vouchers will be notified by email on 10/10/2017.

The information obtained from the study will be written up in my thesis and for publication in a peer reviewed journal. You will not be identified in any report/publication.

If you are willing to take part, please click on the link below:

[https://www.onlinesurveys.ac.uk/SURVEY_desy ...](https://www.onlinesurveys.ac.uk/SURVEY_desy...)

If you are not able to open the web link, please type

[http://www.onlinesurveys.ac.uk/SURVEY_desy ...](http://www.onlinesurveys.ac.uk/SURVEY_desy...)

If you have any questions, please do not hesitate to contact me:

Email: Desy.nuryunarsih@nottingham.ac.uk

Phone number: +62 85781989697

Thank you!

Email reminders

For “no-response” survey reminder.

Dear Colleague,

Recently I invited you to participate in an on-line survey of attitudes and perceptions with regard to smoking kretek cigarettes.

I would be very grateful if you could spend just a few minutes filling out the survey.

By following the link below, you will directly navigate to the survey.

https://www.onlinesurveys.ac.uk/SURVEY_desy_..

Thank you

APPENDIX 14: EMAIL REMINDER

For “no-response” survey reminder.

Dear Colleague,

Recently I invited you to participate in an on-line survey of attitudes and perceptions with regard to smoking kretek cigarettes.

I would be very grateful if you could spend just a few minutes filling out the survey.

By following the link below, you will directly navigate to the survey.

https://www.onlinesurveys.ac.uk/SURVEY_desy_..

Thank you

APPENDIX 15: ONLINE QUESTIONNAIRE ABOUT SMOKING FOR HEALTH CARE PROFESSIONALS

General Participant Information

Q1) Please Indicate your gender

- Male Female

Q2) Which range includes your age?

- Younger than 25 25-34 35-44 45-54
 55-64 65 or older Prefer not to answer

Q3) Where is your workplace/ practice located?

- Urban Rural Suburban Prefer not to answer

Q4) Are you a doctor or a dentist?

- A doctor A dentist

Q5) Where do you work? (Please tick all that apply)

- Private Clinic Hospital Community Health Centre

Q6) Have you ever smoked at least 100 cigarettes or equivalent amount of tobacco in your lifetime?

- Yes No

Q7) Do you now smoke daily, occasionally, or not at all

- Daily Occasionally Not at all

Q8) At what age did you start smoking?

- Younger than 25 25-34 35-44 45-54
- 55-64 65 or older Prefer not to answer

Q9) If you have stopped smoking completely, how long has it been since you last smoked?

- Less than one month One month or longer but less than six months
- Six months or longer but less than one year One year or longer

Benefits of Smoking kretek and Non-kretek cigarette

Q10) Which of the following do you think are reasons for people to smoke kretek and non-kretek cigarettes?

(please tick all that apply)

| | Kretek | Non-Kretek | Neither |
|-----------------------------------|--------------------------|--------------------------|--------------------------|
| As traditional remedy for illness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| As part of the culture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| To be sociable | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Because of addiction to nicotine | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Habit | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Knowledge and attitude about the harms of smoking cigarette

Q11) Which of the following do you think are potential harms of smoking kretek and non-kretek cigarettes?

please tick all that apply)

| | Kretek | Regular cigarettes | Neither | unsure |
|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Lung cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lower respiratory tract infection | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Diabetes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | |
|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Bladder cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Pancreatic cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hypertension | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Oesophagus cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Kretek | Regular cigarettes | Neither | unsure | |
| Breast Cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Nasopharynx cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Colorectal cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cataract | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Stroke | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| To relieve stress | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Leucoplakia | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Others: | ... | ... | ... | ... |

Q12) What is the role of the health professional in smoking and smoking cessation?

| | Yes | No | Unsure |
|--|--------------------------|--------------------------|--------------------------|
| Health professionals serve as role models for their patients and the public. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Health professionals should set a good example by not smoking. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Patient's chances of quitting smoking are increased if a health professional advises him or her to quit. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Health professional should routinely ask about their patients smoking habit. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Health professional who smoke are less likely to advise their patients to quit smoking. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Health professional should get specific training on cessation methods. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Health professional should routinely advise patients who smoke to avoid smoking around children. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Health professional should provide support to patients in helping them to quit. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Effect of smoking on non-smokers | | | |

Q13) what do you think are the potential harms caused to non-smokers who are around people who smoke

| | Kretek | regular cigarettes | Neither |
|-------------------------------|--------------------------|--------------------------|--------------------------|
| Sudden Infant Death Syndrome. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Chickenpox in children | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Heart disease in adults | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Pneumonia in children | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ear infections in children | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Leukaemia | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Birth defect | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Worksite practice

Q14) Which one describes the smoke free enforcements at your workplace

Yes No

Is smoke-free policy enforced at your workplace?

What sort of smoke-free policy is in place at your workplace?

- No smoking policy in place
- No smoking allowed at all on the premises
- Smoking room available

Q15) Have you had any training in how to advise smokers to stop?

| | Yes | No |
|---|--------------------------|--------------------------|
| I feel well prepared when counselling patients on how to stop cigarette smoking | <input type="checkbox"/> | <input type="checkbox"/> |
| I have received formal training during medical school | <input type="checkbox"/> | <input type="checkbox"/> |
| I have received formal training during post graduate education | <input type="checkbox"/> | <input type="checkbox"/> |
| I have attended conference, symposia, or workshops to receive formal training. | <input type="checkbox"/> | <input type="checkbox"/> |

Q16) Which are the following interventions are AVAILABLE to you to help your patients stop smoking?

(please tick all that apply and filled up text for 'others' option)

- None
- Counselling
- Traditional remedies
- Self-help material
- Medication (Nicotine gum, patch, bupropion)
- Others

Q17) Which are the following interventions do you USE to help your patient stop smoking?

(please tick all that apply and filled up text for 'others' option)

- None
- Counselling
- Traditional remedies
- Self-help material
- Medication (Nicotine gum, patch, bupropion)
- Others

The development of tobacco control policy in the Indonesia

Q18) Which one of the following do you think should be implemented by the Indonesian government (please tick

that apply)

- Prohibited smoking in enclosed public places
- Tobacco tax rises
- Enforcement of under-age sales restrictions
- Big text health warnings on cigarette packages
- Banning sport sponsorship by tobacco Industry
- Introducing smoking cessation services
- Facilitating access to smoking cessation medication
- Complete ban on the advertising of tobacco products

Personal Information

The information obtained from the study will be written up in my thesis and for publication in a peer reviewed journal.

You will not be identified in any report/publication.

Please enter your email address in the box below if you are willing to take a part in a prize-draw to win one of 1 Carrefour shopping voucher worth 1.5 million IDR or 100 GBP. The winner of the Carrefour vouchers

will be notified by email on 10/10/2017.

Thank you for taking the time to fill out our survey. Your input is greatly appreciated

APPENDIX 16: QUANTITATIVE WEB-BASED STUDY CONSENT FORM

Welcome to a mixed methods investigation into the behaviours, attitudes and health risk perceptions of the Indonesian population regarding Kretek cigarettes.

You are invited to participate in a web-based survey on health professionals' perceptions regarding the health risks of kretek and regular cigarette. This is a research project being conducted by me, Desy Nuryunarsih, a PhD student at the University of Nottingham UK. If you agree to take part below, you will be taken to the online survey which will take approximately 10 minutes to complete.

Participation

Your participation in this survey is voluntary and you are free to refuse to take part in this survey or exit the survey at any time without penalty.

Benefits

I cannot promise the study will help you but the information I get from the study will help to increase the understanding of smoking health risk perceptions among health professional (physicians and dentists) in Indonesia. The results of this will guide interventions geared to support smoking cessation programs in Indonesia. In order to develop effective health prevention programs and health-risks communication strategies, it is essential to have information about the Indonesian health professionals' opinions of smoking and kretek cigarettes in particular.

Risks

There are no foreseeable risks involved in participating in this study.

Confidentiality

Your survey answers will be sent to a link at Bristol online survey tools where data will be stored in a password protected electronic format. The survey will not contain information that will personally identify you. All data will be pooled

and published in aggregate form only. No one except me will know whether or not you participated in the study. Although every reasonable effort has been taken, confidentiality during actual internet communication procedures cannot be guaranteed (i.e. computer hackers).

Contact

If you have a concern about any aspect of this study, please contact me and I will do my best to answer your questions. My contact details are given at the end of this form. If you remain unhappy and wish to complain formally you can do this through email to: louise.sabir@nottingham.ac.uk.

Compensation

Please leave your email address at the end of the survey questions if you would like to take part in a prize draw to win one of 1 shopping voucher worth 1.5 million IDR or 100 GBP. The winner of the Carrefour vouchers will be notified by email on 10/10/2017.

ELECTRONIC CONSENT: Please select your choice below. You may print a copy of this consent form for your records. Clicking on the “Agree” button indicates that

- You have read the above information
- You voluntarily agree to participate
- You are 18 years of age or older

Agree and go to survey

Disagree and exit

My Contact details:

Desy Nuryunarsih: desy.nuryunarsih@nottingham.co.uk

APPENDIX 17: KEMENTERIAN KESEHATAN ETHICAL PERMISSION



KEMENTERIAN KESEHATAN
BADAN PENELITIAN DAN PENGEMBANGAN KESEHATAN
Jalan Percetakan Negara No. 29 Jakarta 10560 Kotak Pos 1226
Telepon: (021) 4261088 Faksimile: (021) 4243933
E-mail: sesban@litbang.depkes.go.id, Website: http://www.litbang.depkes.go.id

PERSETUJUAN ETIK (ETHICAL APPROVAL)

Nomor : LB.02.01/2/KE.165 /2017

Yang bertanda tangan di bawah ini, Ketua Komisi Etik Penelitian Kesehatan Badan Litbang Kesehatan, setelah dilaksanakan pembahasan dan penilaian berdasarkan Deklarasi Helsinki, dengan ini memutuskan protokol penelitian yang berjudul :

"Penelitian Kualitatif Kuantitatif Mengenai Perilaku, Sikap, dan Persepsi Kesehatan Masyarakat Indonesia terhadap Konsumsi Rokok Kretek (A Mixed Methods Investigation into Indonesian Health Risk Perceptions Regarding Kretek Cigarette)"

yang mengikutsertakan manusia sebagai subyek penelitian, dengan Ketua Pelaksana / Peneliti Utama :

Desy Nuryunarsih, Drg., MPH.

dapat disetujui pelaksanaannya. Persetujuan ini berlaku sejak tanggal ditetapkan sampai dengan batas waktu pelaksanaan penelitian seperti tertera dalam protokol dengan masa berlaku maksimum selama 1 (satu) tahun.

Selama penelitian berlangsung, laporan kemajuan (setelah 50% penelitian terlaksana), laporan *Serious Adverse Event/SAE* (bila ada) harus diserahkan kepada KEPK-BPPK. Pada akhir penelitian, laporan pelaksanaan penelitian harus diserahkan kepada KEPK-BPPK. Jika ada perubahan protokol dan/atau perpanjangan penelitian, harus mengajukan kembali permohonan kajian etik penelitian (amandemen protokol).

Jakarta, 4 Mei 2017

Ketua
Komisi Etik Penelitian Kesehatan
Badan Litbang Kesehatan,

Prof. Dr. M. Sudomo

APPENDIX 18: UNIVERSITY OF NOTTINGHAM ETHICAL PERMISSION



University of Nottingham
UK | CHINA | MALAYSIA

Email: FMHS-ResearchEthics@nottingham.ac.uk

**Faculty of Medicine & Health Sciences
Research Ethics Committee**

c/o Faculty PVC Office
School of Medicine Education Centre
B Floor, Medical School
Queen's Medical Centre Campus
Nottingham University Hospitals
[Nottingham, NG7 2UH](http://www.nottingham.ac.uk)

6 July 2017

Desy Nuryunarsih, DDS, MPH
PhD student
c/o Prof. Sarah Lewis
Supervisor, Professor of Medical Statistics
Division Epidemiology and Public Health
Clinical Science Building
City Hospital Campus, Hucknall Road
Nottingham
NG5 1PB

Dear Desy Nuryunarsih

| | |
|---|---|
| Ethics Reference No: 48-1704 – please always quote | |
| Kementerian Kesehatan Ethics ref: LB.02.01/2/KE.165/2017 | |
| Study Title: A mixed methods investigation into the behaviours, attitudes and health risk perceptions of the Indonesian population regarding kretek cigarettes | |
| Chief Investigator/Supervisor: Prof. Sarah Lewis, Professor of Medical Statistics, Dr Tessa Langley, Assistant Professor, Division Epidemiology and Public Health. | |
| Lead Investigators/student: Desy Nuryunarsih, DDS, MPH, PhD student, Division Epidemiology and Public Health. | |
| Type of Study: PG, PhD, qualitative, questionnaire, semi-structured interviews, overseas | |
| Proposed Start Date: 6/7/2017 | Proposed End Date: 10/11/17 4 mths |
| No of Subjects: 1060 | Age: 18+years |
| School: Medicine | |

Thank you for submitting the above application which has been considered by the Committee and the following documents were received:

- FMHS REC Application form and supporting documents version 1.0: 09.03.2017
- Research ethical approval letter from Ministry of Health Republic of Indonesia. 04.05.2017

These have been reviewed and are satisfactory and the study has been given a favourable opinion.

A favourable opinion is given on the understanding that the conditions set out below are followed:

1. A Favourable opinion is given on the understanding that all appropriate ethical and regulatory permissions are respected and followed in accordance with all local laws of the country in which the study is being conducted and those required by the host organisation/s involved.
2. You should follow the protocol agreed and inform the Committee of any changes using a notification of amendment form (please request a form).
3. You must notify the Chair of any serious or unexpected event.
4. An End of Project Progress Report is completed and returned when the study has finished (please request a form).

Yours sincerely

pp *L. Mahajan*

Professor Ravi Mahajan
Chair, Faculty of Medicine & Health Sciences Research Ethics Committee