THE PREVALENCE OF SHISHA AND ELECTRONIC CIGARETTE SMOKING AMONG HIGH SCHOOL STUDENTS IN JAKARTA, INDONESIA

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Public Health
College of Public Health Sciences
Chulalongkorn University
Academic Year 2014

ความชุกของการสูบบุหรี่ไฟฟ้า และชิชาร์ในกลุ่มนักเรียนมัธยมศึกษาในจาการ์ตา ประเทศอินโดนีเซีย

นายไรดวันฮ์ เฟาว์ซิ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2557

Thesis Title	THE PREVALENCE OF SHISHA AND ELECTRONIC CIGARETTE SMOKING AMONG HIGH SCHOOL STUDENTS IN JAKARTA, INDONESIA
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Field of Study	Public Health
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ไรดวันฮ์ เฟาว์ซิ : ความชุกของการสูบบุหรี่ไฟฟ้า และชิชาร์ในกลุ่มนักเรียนมัธยมศึกษาในจาการ์ตา ประเทศอินโดนีเซีย (THE PREVALENCE OF SHISHA AND ELECTRONIC CIGARETTE SMOKING AMONG HIGH SCHOOL STUDENTS IN JAKARTA, INDONESIA) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: จิตรลดา อารีย์สันติชัย, 106 หน้า.

ชิชาร์ และบุหรี่ไฟฟ้า เป็นผลิตภัณฑ์ใหม่ที่แพร่หลายในทั่วโลก โดยเฉพาะอย่างยิ่งกลุ่มวัยรุ่นที่ถือเป็นกลุ่มเสี่ยงของการใช้บุหรี่ไฟฟ้า และชิชาร์ วัตถุประสงค์ของการศึกษาวิจัย เพื่อสำรวจความชุก รวมทั้งปัจจัยกำหนดทางสังคมสำหรับการเลือกใช้สูบบุหรี่บุหรี่ไฟฟ้า และชิชาร์ของกลุ่มนักเรียนในระดับมัธยมปลายของกรุงจาร์กาต้า ประเทศอินโดนีเซีย

วิธีการวิจัย เป็นแบบภาคตัดขวาง ใช้การสุ่มแบบหลายขั้นตอน กลุ่มตัวอย่างสำหรับงานวิจัย จำนวน 1,318 คน อายุระหว่าง 15 – 19 ปี จากโรงเรียนระดับมัธยมศึกษา 14 แห่ง (โรงเรียนกึ่งเมือง 8 แห่ง และในเขตเมือง 6 แห่ง)

ผลการศึกษาพบว่าพฤติกรรมการสูบชิชาร์ของกลุ่มนักเรียนร้อยละ 20.6% เคยลองสูบชิชาร์ ร้อยละ 15.5% เคยสูบชิชาร์ใน 1 ปีที่ผ่านมา และร้อยละ 5.2% เป็นผู้สูบปัจจุบัน สำหรับพฤติกรรมการ สูบบุหรี่ไฟฟ้าพบว่า นักเรียนที่เคยสูบ คิดเป็นร้อยละ 14.6% ผู้ที่สูบในช่วงปีที่ผ่านมา คิดเป็นร้อยละ 12.5% และเพิ่งเริ่มสูบคิดเป็นร้อยละ 3.4% นอกจากนี้กลุ่มนักเรียนที่สูบทั้งชิชาร์และบุหรี่ไฟฟ้า คิดเป็นร้อยละ 10.5% โดยร้อยละ 7.6% สูบบุหรี่ทั้งสองแบบมาแล้ว 1 ปี ที่ผ่านมา และมีเพียงร้อยละ 1.1% ที่สูบบุหรี่ทั้งสองแบบในช่วง 30 วันที่ผ่านมา การวิเคราะห์ด้วยการถดถอยโลจิสติกพบว่า เพศ สถานที่ตั้งของโรงเรียน การศึกษาของบิดา พฤติกรรมการสูบบุหรี่ของบิดาและกลุ่มเพื่อนสนิท พฤติกรรมการสูบบุหรี่ที่ผ่านมา พฤติกรรมการสูบบุหรี่เมื่อปีที่แล้ว รวมทั้งศักยภาพในการจัดหาบุหรี่เพื่อการสูบ มีความสัมพันธ์กับการสูบชิชาร์และบุหรี่ไฟฟ้า อย่างไรก็ตามตัวแปรที่สำคัญที่จัดเป็นตัวชี้วัดพฤติกรรมการเลือกสูบบุหรี่ไฟฟ้าและชิชาร์คือพฤติกรรมการสูบบุหรี่แบบต่อเนื่องเป็นเวลานาน โดยกลุ่มนักเรียนที่มีพฤติกรรมสูบบุหรี่มานาน มีโอกาสเสี่ยงต่อการเลือกทดลองสูบชิชาร์ประมาณ 4 เท่า (AOR = 4.252, 95%CI = 2.683 – 6.734) และมีโอกาสเสี่ยงต่อการเลือกทดลองสูบบุหรี่ไฟฟ้า (AOR = 4.496, 95%CI = 2.520 – 8.022) เมื่อเทียบกับกลุ่มนักเรียนที่ไม่สูบบุหรี่

ความชุกในการสูบชิชาร์และบุหรี่ไฟฟ้า อยู่ในระดับสูง ดังนั้นควรมีการจัดโปรแกรมเพื่อป้องกันการใช้ชิชาร์และบุหรี่ไฟฟ้าในกลุ่มนักเรียนอย่างเร่งด่วน

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2557 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

5778822553 : MAJOR PUBLIC HEALTH
KEYWORDS: ELECTRONIC CIGARETTE / SHISHA / SMOKING / HIGH SCHOOL STUDENT

RIDHWAN FAUZI: THE PREVALENCE OF SHISHA AND ELECTRONIC CIGARETTE SMOKING AMONG HIGH SCHOOL STUDENTS IN JAKARTA, INDONESIA. ADVISOR: ASST. PROF. CHITLADA AREESANTICHAI, Ph.D., 106 pp.

Shisha and electronic cigarette smoking become new global epidemic. Youth were the most vulnerable group to be attracted using this product. The study aims to find out prevalence and significant predictors of shisha electronic cigarette smoking among high school students in Jakarta Indonesia.

The study design was cross-sectional with multistage cluster random sampling. A total of 1,318 students aged 15-19 from 14 schools (suburban: 8 and downtown: 6) participated.

The prevalence of shisha smoking were 20.6% in lifetime, 15.5% in past year, and 5.2% in current. For electronic cigarette, the prevalence of lifetime, past year, and current smoker reached to 14.6%, 12.5%, and 3.4% respectively. About 10.5% of respondents ever tried both of shisha and electronic cigarette, 7.6% used in past year, and 1.1% in past 30 days. Multiple logistic regression found gender, school location, father education, smoking status of father and close friends, lifetime cigarette smoking, past year cigarette smoking, and availability were predictors for electronic cigarette and shisha use. Furthermore, lifetime cigarette smoking was the strongest predictor which were 4 times more likely to tried shisha (AOR: 4.251 95% CI: 2.683-6.734) and electronic cigarette (AOR: 4.496, 95% CI: 2.52-8.022) than nonsmoker.

The prevalence of shisha and electronic cigarette smoking was considerably high in this study. Thus, health promotion program with emphasize to prevent shisha and electronic cigarette smoking were urgently needed.

Field of Study: Public Health Student's Signature .....

Academic Year: 2014 Advisor's Signature .....

ACKNOWLEDGEMENTS

The highest praise to the Almighty God, Allah Subhanahu Wataala, for His blessing, I can complete this thesis. Shalawat and greeting devotes to the Prophet Muhammad Sallallahu Alaihi Wassalam.

I would like to express my gratitude to my thesis advisor Asst. Prof. Chitlada Areesantichai, Ph.D for her assistance and motivation in the entire process of thesis writing. Many thanks also extended to Assoc. Prof. Ratana Somrongthong, Ph.D, Asst. Prof. Usaneya Perngparn, Ph.D, and Assoc. Prof. Sompoch Iamsupasit, Ph.D for valuable contribution to improve my thesis.

Gratitude to Chulalongkorn University for giving opportunity as a recipient of ASEAN and the 90th Anniversary of Chulalongkorn University Scholarship. It was an honor for me. In addition, I would like to thanks the family of College of Public Health Sciences including all the Ajarn, classmate MPH 2014, and all staffs for supporting during my study.

Finally, I express my deepest thanks to my parents, brothers, Indonesian Public Health Association, Indonesian CU I House, and Ngajikok family. They were my biggest motivator in pursuing master degree.

Hopefully, this study can give valuable contribution to the public health in Indonesia, especially for tobacco control program.

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
ASEAN	Association of South East Asia Nation
BAT	British American Tobacco
CI	Confidence Interval
CO	Carbon monoxide
CVD	Cardiovascular Diseases
DEFF	Design Effect
Ecig	Electronic Cigarette
ENDS	Electronic Nicotine Delivery System
FCTC	Framework Convention on Tobacco Control
FDA	Food and Drugs Administration
GATS	Global Adult Tobacco Survey
GYTS	Global Youth Tobacco Survey
HIV	Human Immunodeficiency Virus
IDR	Indonesian Rupiah
KT&G	Korea Tobacco and Ginseng Corporation
NCD	Non Communicable Diseases
NIHRD	National Institute for Health Research and Development
OR	Odds Ratio
PAHs	Polycyclic Aromatic Hydrocarbons
SCT	Social Cognitive Theory
TPB	Theory Planed Behavior
TRA	Theory of Reason Action
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background and Rational

Tobacco epidemic is major global public health threat nowadays (World Health Organization, 2008). It killed 100 million people worldwide in 20th century, and projected to reach 1 billion people in 21st century (World Health Organization, 2008). During last decade, tobacco related death grasped 50 million lives which were greater than HIV/AIDS, Malaria, and Tuberculosis combine (Eriksen, Mackay, & Ross, 2012; World Health Organization, 2008). Moreover, tobacco use is a leading risk factors of Non Communicable Diseases (NCD) (World Health Organization, 2008). Half of those who die due to NCD occurred during the prime productive age of 35-69 years old (World Health Organization, 2005). Thus, The World Economic Forum 2011 was considered NCD as global economic burden (Bloom et al., 2011).

Indonesia denoted as the world's third largest tobacco market (Tobacco Control Support Center, 2014; World Health Organization, 2013). More than one-third (36.3%) of Indonesian people were considered as current smoker. The prevalence among male were 68.8 % while in female reached to 6.9% in 2013 (Kementerian Kesehatan (Kemenkes - MOH) of Republik of Indonesia, 2013). The prevalence of male adult smoker in Indonesia was recognized as the world highest (World Health Organization, 2013). Likewise, prevalence of female smoker has been increasing by 400% in the past 20 years (Aditama, 2014; Kementerian Kesehatan (Kemenkes - MOH) of Republik of Indonesia, 2013). Furthermore, tobacco was responsible for 235,000 people death annually (Tobacco Control Support Center, 2012). The healthcare costs attributed to tobacco related diseases and death were amount to 11 trillion Rupiah each year (1.2 billion USD) (Kossen, 2012).

Tobacco use in any form mostly begins at onset adolescent and young adulthood period (US Department of Health and Human Services, 2012). Immature of thinking, impulsivity, lack of decision-making skills, desire to imitate adult behavior, and peer group pressure are driven factors that influence to initiate smoking (US Department of Health and Human Services, 2012). In Indonesia, smoking prevalence among adolescent was 18.3%. The prevalence among male adolescent reached to 37.3% and 3.1 % in female (WHO Regional Office For South East Asia, 2009). A total of 80% current smokers experimented first puff of tobacco before age of 19 years (Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia, 2011; Tobacco Control Support Center, 2014).

At the same time, world is facing emerging non-cigarette smoking product (Camenga et al., 2014; Maziak et al., 2014). The most phenomenon is probably waterpipe smoking or shisha or Hookah and Electronic Nicotine Delivery System (ENDS) or electronic cigarette (Maziak et al., 2014; O'Connor, 2012). People usually have miss perception in safety issue of shisha and electronic cigarette which considered harmless and more socially acceptable than regular cigarette (Caponnetto, Campagna, Papale, Russo, & Polosa, 2012; Kakodkar & Bansal, 2013).

In fact, shisha smoking had many similarity toxicants with conventional cigarette smoke (Pepper & Eissenberg, 2014). It contained nicotine, polycyclic aromatic hydrocarbons (PAHs), carbon monoxide (CO), volatile aldehydes, and lots of heavy metals compound (Pepper & Eissenberg, 2014). These toxicant well known related with adverse health problem including heart diseases, cancer, and dependence like cigarette smoking (Pepper & Eissenberg, 2014). Shisha tended associated with Psychiatric Problem, Pulmonary Diseases, Cancer, Cardiovascular Diseases (CVD), and disposed negative impact to pregnancy (Blachman-Braun, Lira Del Mazo-Rodriguez, Lopez-Samano, & Buendia-Roldan, 2014; Maziak, 2013). Furthermore, another study revealed that there was sufficient evidence to consider shisha as harmful element for both smoking and passive smoking (Blachman-Braun et al., 2014).

Electronic cigarette received large attention among public health advocate due to its vague role on tobacco control either as tools to assist smoking cessation or new gateway to initiate tobacco smoking (International Union Againsts Tuberculosis and Lung Diseases, 2013). There is no sufficient scientific evidence of its safety and benefit to health (International Union Againsts Tuberculosis and Lung Diseases, 2013). Electronic cigarette could act as a starter product for cigarette smoking, particularly among adolescent who may be attracted by technological advance image, and its flavor (Henningfield & Zaatari, 2010). Moreover, electronic cigarette may lure former smokers return to nicotine dependence, and delay cessation among current smokers (International Union Againsts Tuberculosis and Lung Diseases, 2013). An online forum in US reported potential short and long term of electronic cigarette use including dizziness, hypertension, pneumonia, congestive heart failure, anemia, and cardiac rhythm change (M, M, & Talbot, 2013). Therefore, World Health Organization (WHO) recommended electronic cigarette to be strictly regulated similar as medical product (World Health Organization - Tobacco Free Initiative, 2014). WHO also prohibited electronic cigarette manufactures making health claim including aid to smoking cessation until they could provide strong scientific evidence based on clinical trial and well-controlled, and obtained regulatory approval (International Union Againsts Tuberculosis and Lung Diseases, 2013).

At the beginning, shisha smoking gained popularity from Middle-East countries and then quickly widespread globally since last decade (Maziak, Ward, Soweid, & Eissenberg, 2004). Global Adult Tobacco Survey (GATS) provided data on shisha use in 13 countries, the highest prevalence of shisha smoking among male was in Vietnam (13%) and Egypt (6.2%) whilst among female was in Russia (3.2%) and Ukraine (1.1%) (Morton et al., 2014). Multicounty study among Gulf Cooperation Council member states concluded that shisha use almost replaced cigarette as the most popular method of tobacco smoking among 13-15 years old student (Mulla et al., 2008). In Indonesia, Global Youth Tobacco Survey (GYTS) 2009 recorded that a total 6.5% of adolescent 13-15 years old in Indonesia were currently use other tobacco products (Boy 10.3%, Girl 3.1%) (WHO Regional Office For South East

Asia, 2009). There is no further information regarding what specific form of non-cigarette smoking.

The prevalence of electronic cigarette use among youth was increasing recently (Ahern & Mechling, 2014). A school based survey (high school and university) in Poland for the year 2012 estimated that 23.5% of students aged 15-19 years had ever-used e-cigarettes, and 8.2% of students had used e-cigarettes in the past 30 days (Goniewicz & Zielinska-Danch, 2012). Similar survey was conducted in Canada revealed 16.1% of respondents ever reported trying an e-cigarette (Czoli, Hammond, Reid, Cole, & Leatherdale, 2015). Another evidence to conclude electronic cigarette as global epidemic was arising of the demand. The Euromonitor International estimated that e-cigarette market was worth in excess of 2 billion USD globally by the end of 2012 (Euromonitor International, 2012).

Shisha and electronic cigarette seems getting popularity among young generation in Indonesia particularly in big city according to some anecdotal report (Gatra, 2014; Suara Merdeka, 2006). People could easily find shisha and electronic cigarette seller in shopping mall, online shop, and even small kiosk in Jakarta (Gatra, 2014; Suara Merdeka, 2006). In addition, shisha café is usually located in favorite hangout place for adolescent (Harian Terbit, 2014). Unfortunately, there is no regulation specific for preventing shisha and electronic cigarette use. Without any concrete measure to control shisha and electronic cigarette smoking, Indonesia would bear multiple burden of tobacco use in the near future.

After considering all finding, there is knowledge gap on shisha and electronic cigarette in Indonesia. Despite GYTS reported non-cigarette use but didn't specifically explain what type of other tobacco use. In addition, it only involved age group of 13-15 years old. In other word, Indonesia doesn't have adequate data on shisha and electronic cigarette use particularly among adolescent. Therefore, this study aims to find out prevalence of shisha and electronic cigarette use among high school student age of 15-19 years old in Jakarta. The finding of study can be evidence based for government to develop new regulation and prevention program to control any kind of tobacco use in future.

1.2 Research Questions

1. What is prevalence of shisha use among high school student in Jakarta?
2. What is prevalence of electronic cigarette use among high school student in Jakarta?
3. What is prevalence of both shisha and electronic cigarette use among high school student in Jakarta?
4. How is association between socio-demographic, social influence, accessibility, knowledge, and cigarette smoking status with shisha and electronic cigarette smoking among high school student in Jakarta?

1.3 Objectives

1. To describe prevalence of shisha use among high school student in Jakarta.
2. To describe prevalence of electronic cigarette use among high school student in Jakarta.
3. To describe prevalence of both shisha and electronic cigarette use among high school student in Jakarta.
4. To examine association between socio-demographic, social influence, accessibility, knowledge, and cigarette smoking status to electronic cigarette and shisha smoking among high school student in Jakarta.

1.4 Operational Definitions

1. School referred to general type school run by government.
2. Electronic cigarette smoking referred to smoking behavior or intentional inhalations of electronic cigarette smoke at least one puff in lifetime.
3. Shisha smoking referred to smoking behavior or intentional inhalations of shisha smoke at least one puff in lifetime.
4. Social influence referred to smoking behavior of important persons surrounding respondents such as father, mother, brother, sister, close friend, classmate, and teacher.
5. Accessibility referred to perceive availability, affordability, and always have enough money to buy shisha and electronic cigarette.

6. Knowledge toward Electronic Cigarette and Shisha Smoking referred to respondent's knowledge on harmful effect of smoking shisha and electronic cigarette.
7. Cigarette Smoking Status means to tobacco smoking status of respondents whether they are smoke or intentionally inhale tobacco smoke at least one puff in lifetime.

1.5 Conceptual Framework

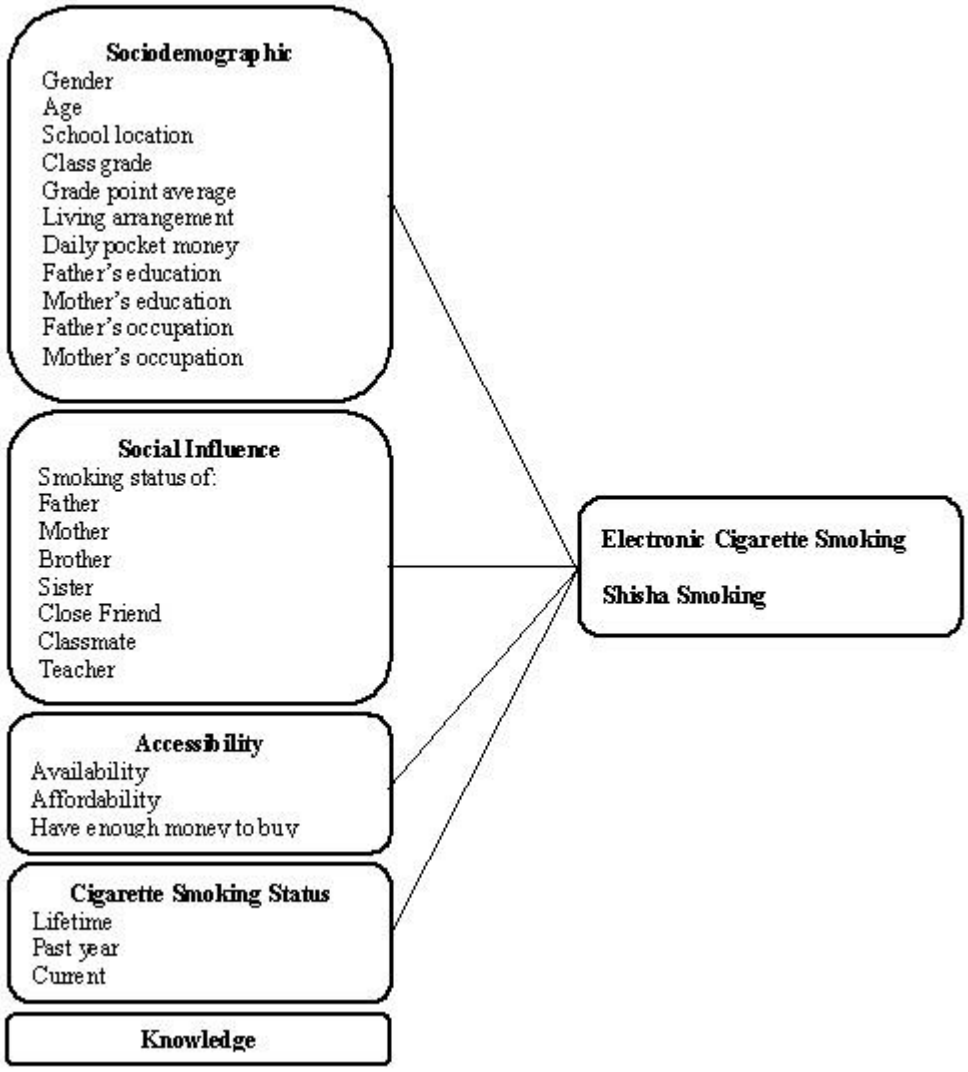

Figure 1: Conceptual Framework

CHAPTER II

LITERATURE REVIEW

This literature review of prevalence of electronic cigarette and shisha smoking among adolescent in Jakarta will be presented in nine parts as follows:

1. Tobacco Epidemic in Indonesia
2. Smoking Problem among Adolescent in Indonesia
3. Shisha Smoking Behavior Among Adolescent
4. Health Effect of Shisha Smoking
5. Electronic Cigarette Smoking Behavior Among Adolescent
6. Health Effect of Electronic Cigarette Smoking
7. Theoretical
8. Tobacco Control Policy in Indonesia
9. Related Research on Shisha and electronic cigarette smoking among Adolescent.

2.1 Tobacco Epidemic in Indonesia

Thabrany (2012) expressed that Indonesia was the heaven for cigarette companies and the hell for the people (Thabrany, 2012). This bombastic statement was backed by the situation of tobacco epidemic in Indonesia (Thabrany, 2012). The prevalence of tobacco use was in alarming situation, a total of 36.3% of Indonesian people were actively smoking tobacco in any form (Kementerian Kesehatan (Kemenkes - MOH) of Republik of Indonesia, 2013). The prevalence of tobacco use among man reached 68.8% which considered as the highest worldwide (National Institute of Health Research and Development, 2012). In woman, the prevalence was very low (6.9%) compare to the man (Kementerian Kesehatan (Kemenkes - MOH) of Republik of Indonesia, 2013). However, this prevalence has been increased fourfold since 1995 (Kementerian Kesehatan (Kemenkes - MOH) of Republik of Indonesia, 2013).

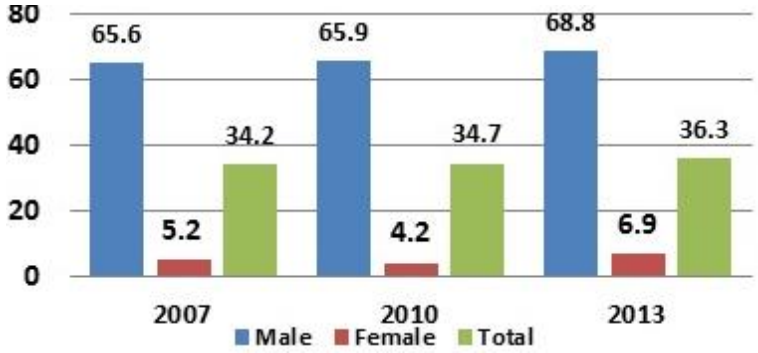

Figure 2: Prevalence of Tobacco Use in Indonesia

Source: Basic Health Research 2007, 2010, 2013 (Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia, 2013; Tobacco Control Support Center, 2012)

The most worrying fact of tobacco epidemic isn't only for the smoker but also for nonsmoker who exposed by tobacco smoking. A total of 51.3% of Indonesian people exposed by tobacco smoke in workplace, and other 85,4% in restaurant (National Institute of Health Research and Development, 2012). Moreover, Adolescent age of 15-19 who exposed by tobacco smoke reach to 78.1% in public places every day (WHO Regional Office For South East Asia, 2009).

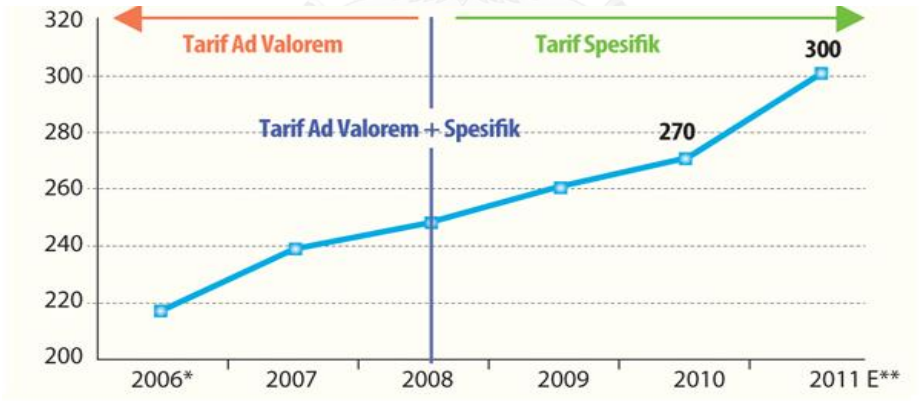

Figure 3: Indonesian Cigarette Production (Billion Sticks)

Source: Indonesian Tobacco Fact 2012 (Tobacco Control Support Center, 2012)

A total of 302 billion cigarette stick were consumed by 70 million smokers a year in 2013 including children (Markus et al., 2013). The total cigarette tax revenue was about 7 billion US$ while the government allocation for ministry of health only 3 billion US$ (Thabrany, 2012). The tobacco industry was fully aware with such a promising market. Hence, the transnational tobacco industry including Phillip

Morris, British American Tobacco (BAT), and Korea Tobacco and Ginseng Corporation (KT&G) massively took over the national tobacco industry since early 2000 that controlled more than 37% market share now (Tobacco Control Support Center, 2012).

Tobacco use was major risk factor of non-communicable diseases that had led to epidemiological changing worldwide including Indonesia (World Health Organization, 2008). More than half of death was caused by non-communicable diseases (Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia, 2008). Cardiovascular Diseases and Cancer were the leading cause of morbidity and mortality in Indonesia (Kementerian Kesehatan (Kemenkes - MOH) of Republik of Indonesia, 2013). Non-communicable diseases also induced the catastrophic event due to expensive medical treatment and disability (Tobacco Control Support Center, 2012). The situation was more terrifying because no less than 120 million Indonesian people posed health care inequity (Thabrany, 2012). In addition, Indonesian people have to pay by out of pocket for clinical service fee (Thabrany, 2012). The National Institute for Health Research and Development (NIHRD) revealed that total economic loss from tobacco related diseases was amounts to 1.2 billion USD (Tobacco Control Support Center, 2012, 2014).

Tobacco doesn't only kill smoker himself but also those who don't and even never smoke (Eriksen et al., 2012). Exposure to secondhand smoke contributed to 600,000 individual die annually worldwide (Eriksen et al., 2012). Secondhand smoke was considered as the world's critical environmental health hazard (Eriksen et al., 2012). In Indonesia, 78.4% of adult (>15 years old) were exposed by secondhand smoke at home, 85.4% in restaurant, and 51.3% at workplace (National Institute of Health Research and Development, 2012). Among teenagers (13-15 years old), 68.8% were exposed by secondhand smoke at home, and 78.1% outside their home (WHO Regional Office For South East Asia, 2009). Women and child are the most vulnerable group from environmental tobacco smoke threat (Eriksen et al., 2012).

In summary, tobacco use considered as leading public health problem nowadays due to cause many diseases and death. The tobacco use magnitude of problem doesn't only span public health sphere but also socio-economic. In addition, tobacco use also causes adverse health effect for those who never smoked.

2.2 Smoking Problem among Adolescent in Indonesia

Adolescent is the most vulnerable group to be trapped in long term smoking dependence (US Department of Health and Human Services, 2012). Smoking behavior among adolescent were determined by combination of biological, psychosocial, and environmental factors (Tobacco Control Support Center, 2014; US Department of Health and Human Services, 2012). Adolescent period are in sensitive stage of life course development (US Department of Health and Human Services, 2012). In this period, the brain was extraordinary change which generates high levels of emotion, impulsivity, and risk-taking (US Department of Health and Human Services, 2012). The changing was accompanied by immature cognitive control system (Steinberg, 2007; US Department of Health and Human Services, 2012). Therefore, many high risk behaviors such as smoking, alcohol consumption, illicit drugs use, and unsafe sex firstly occurred in this period (Steinberg, 2007; US Department of Health and Human Services, 2012).

US Surgeon general reported that more than 88% of establish adult smokers initiated of smoking before age of 18 years (US Department of Health and Human Services, 2012). Approximately, 40,000 to 50,000 children in Asia start smoking every day (Lian & Dorotheo, 2013). In Indonesia, smoking habit tend to increase in the younger generation. Eventhough there is a decrease of smoking prevalence among adolescence compare to 2010, the data indicated prevalence of adolescent smoker (aged 15 to 19 years) from 1995 to 2010 increased by 3 times ranging from 7.1% to 20.3% (Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia, 2013; Tobacco Control Support Center, 2012). In addition, the smoker is getting younger, current adult smoker who started smoking at age of 10-14 years old increased from 8.9% in 1995 to 17.5% in 2010 (Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia, 2013; Tobacco Control Support Center, 2012).

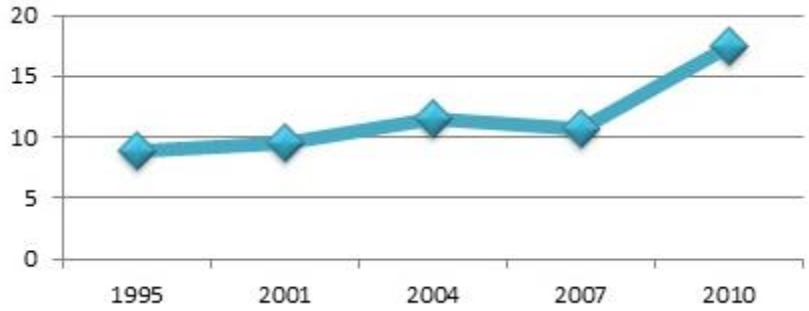

Figure 4: Proportion of Current Adult Smokers who start smoke at age of 10-14 years old

Source: National Socio Economic Survey 1995, 2001, 2004 (Statistics Indonesia (Badan Pusat Statistik-BPS), 1995, 2001, 2004), Basic Health Research 2007 & 2010 (Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia, 2008, 2011).

Indonesia is also known as baby smoker country because of the many kids who already smoke tobacco at under five age (Aditama, 2014). There was several cases report of toddler smoking, among others: in Malang, East Java, Sandi Adi Susanto, (age 4 years) who was already addicted to smoking since the age of 1.5 years. (Aditama, 2014) Another case, In Betung Musi, South Sumatra, Ardi Rizal, (age 2 years) (Aditama, 2014; Lian & Dorotheo, 2013).

In conclusion, the smoker is getting younger over years. The rapid physiological changing formed curious mentality during adolescent period droved to experiment tobacco smoking. In addition, tobacco industry is deliberately targeted young people to replace the older one who died prematurely. Thus, among all age group, adolescent is the most vulnerable group to be addicted by tobacco smoking in any form. The huge number of underage smoking will not only in impacting on young generation who are not healthy, but also threathening to the quality of the nation.

2.3 Shisha Smoking among Adolescent

Waterpipe (Shisha, Hookah, or Narghile) smoking is probably one of global phenomenon during this decade (Maziak et al., 2014; Maziak, Ward, et al., 2004). This tobacco use form is firstly famed in Persia and India, then widespread globally one decade later particularly in Middle East (American Lung Association, 2007b; Maziak et al., 2014). The prevalence of shisha smoker is appeared increasing

particularly among adolescent (American Lung Association, 2007b). In Gulf Cooperation Council Countries, The shisha smoking had replaced cigarette smoking popularity among boy and girl age of 13-15 years (Mulla et al., 2008). For instance, the prevalence of current cigarette smoker in Bahrain was 17.5%, while other tobacco use is 15.3% (Mulla et al., 2008). The pattern was pretty similar in all countries (Mulla et al., 2008).

A cross country (13 countries) comparison from GATS data revealed Vietnam has highest prevalence of shisha use among man (13%) and Russia (3.2%) among woman (Morton et al., 2014). A survey carried out in the US University students showed a total of 40.5% from 647 respondents reported ever tried shisha smoking, 30.6% used within past year, and 9.5% smoked in past 30 days (Primack et al., 2008). Another study among secondary school student in Montreal, Canada revealed about 52% of the participants (n=777) reported lifetime shisha smoker in 2011-2012 (Dugas, O'Loughlin, Low, Wellman, & O'Loughlin, 2014). Among lifetime user, 15% initiated shisha smoking before 16 years old, 29% initiated between age of 16-17 years old, 41% initiated between age 18-20, and the last 15% initiated after 20 years old (Dugas et al., 2014).

In conclusion, the shisha smoking seems to be more appeal to adolescent. The research showed that more than half shisha smoker firstly tried during the age of high school period. Despite no data on shisha smoker in Indonesia, the researcher assumes the situation in Indonesia is similar. According to media and some anecdotal reports the shisha café was flourished particularly in big city of Indonesia.

2.4 Health Effect of Shisha Smoking

Shisha compose by four main parts that are bowl, body, head, hose/mouthpiece (American Lung Association, 2007a). The tobacco mixture is usually placed in the head wrapped by aluminum foil while burning charcoal is placed above it (American Lung Association, 2007a, 2007b). There is a hollow conduit under the head which transmit heat in the head to the water in the bowl (American Lung Association, 2007a, 2007b). The water is mixed with other liquid sometimes (American Lung Association, 2007a, 2007b). A hose/mouthpiece is installed above

the waterline to drawn the smoke exit. Thus, the shisha smoker inhales both charcoal and tobacco smoke (Pepper & Eissenberg, 2014). In addition, shisha user usually come to the shisha café with his friend and share the mouthpiece/hose together (Blachman-Braun et al., 2014). This behavior increased risk transmission of combinable diseases (Maziak, 2008).

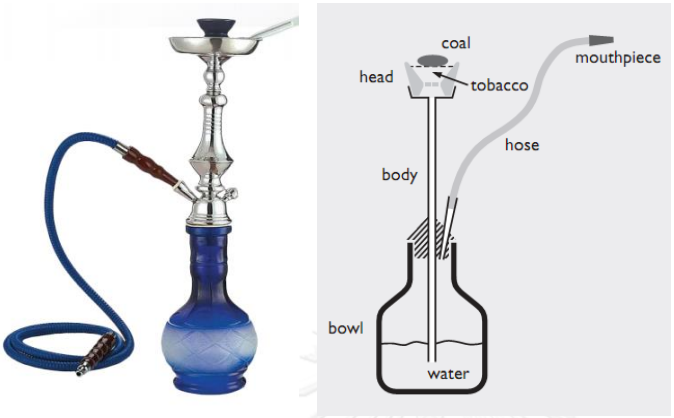

Figure 5: Shisha Smoking

Source: American Lung Association (American Lung Association, 2007a, 2007b)

Most of the shisha smoking users were not aware with its potential health risk. In facts, a systematic review from previous studies found that shisha smoke contained similar toxicants as the cigarette smoke such as nicotine, carbon monoxide, polycyclic aromatic hydrocarbons, volatile aldehydes, and Tar (Pepper & Eissenberg, 2014). These chemical compounds were related to some health problem (Pepper & Eissenberg, 2014). For instance, CO linked to the cardiovascular diseases, PAHs contributed to cancer, aldehyde damaged lung function, and nicotine level in shisha smoker was equivalent to 10 cigarette sticks (Stepanov et al., 2014). Thus, this amount was sufficient to conclude shisha lead to addiction (Stepanov et al., 2014). In addition, shisha smoker were exposed to the risk of infectious diseases since they usually share the mouthpiece and some of individual don't change the water in the bowl each session (Blachman-Braun et al., 2014).

In summary, despite research on long term health effect of shisha smoking is remain scarce, we already have sufficient evidence to underline that shisha have bad health effect to health. The previous research found chemical compound in

shisha was quite similar with regular cigarette. Unfortunately, many people were in misperception regarding harm effect of shisha. They considered shisha was safer compare to regular cigarette.

2.5 Electronic Cigarette Smoking among Adolescent

Electronic Nicotine Delivery System or electronic cigarette is a new emerging tobacco smoking form (International Union Againsts Tuberculosis and Lung Diseases, 2013). It was firstly fabricated in China year 2003, and rapidly marketed around the world (World Health Organization, 2014). US Center for Diseases Control reported high school student who ever tried an electronic cigarette was doubled from 4.7% in 2011 to 10.1% in 2012. Among those who ever used electronic cigarette, 9.3% said never smoked regular cigarette (US Center for Disease Control and Prevention, 2013). In UK, an adult panel survey revealed nonsmoker who classified as ever and current user of ENDS was 0.4% and 0.1% respectively (Dockrell, Morrison, Bauld, & McNeill, 2013).

A Prospective study among high school students from two suburban areas in New York and Connecticut revealed trend of electronic cigarette use among students increased over the years (Camenga et al., 2014). At the baseline in February 2010, a total of 0.9% students recorded ever used electronic cigarette during past 30 days then increased to 1.7%, and 2.3% in October 2010, and June 2011 respectively (Camenga et al., 2014). A survey in Korea found that 0.5% adolescent had ever used electronic cigarette at least one time in life (Lee, Grana, & Glantz, 2014). Similar study conducted in Poland found among 23.5% of high school student age of 15-19 had ever tried electronic cigarette, and 8.2% used in past 30 days (Goniewicz & Zielinska-Danch, 2012).

In conclusion, electronic cigarette is more attracted for adolescent. The previous studies uttered increasing trend of electronic cigarette use among adolescent. Electronic cigarette is already popular not only in developed world but also widespread low and middle income country.

2.6 Health Effect of Electronic Cigarette Smoking

Electronic cigarette is a device to vaporize or deliver chemical compound composed by nicotine to the lung without burning tobacco (International Union Againsts Tuberculosis and Lung Diseases, 2013; Pepper & Eissenberg, 2014). electronic cigarette is typically in flavor that may attract adolescent (International Union Againsts Tuberculosis and Lung Diseases, 2013). The anatomy of electronic cigarette is consisted by vaporization system, rechargeable battery, and cartridge contained by different liquid humectant, flavor, and nicotine although some products claimed don't contain nicotine (International Union Againsts Tuberculosis and Lung Diseases, 2013; Pepper & Eissenberg, 2014). When the power is switched on, a metal in vaporization system will heat a liquid inside the cartridge. This process will form a mist or aerosol which looks like similar with conventional cigarette (Caponnetto et al., 2012).

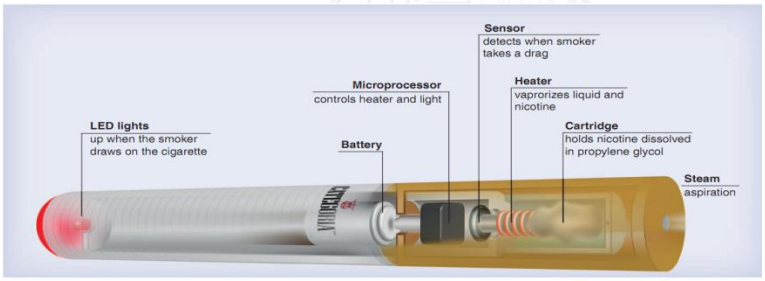

Figure 6: Electronic Nicotine Delivery System or Electronic Cigarette

Source: The emerging phenomenon of electronic cigarette (Caponnetto et al., 2012)

Until now, safety issue of electronic cigarette hasn't been scientifically proven (International Union Againsts Tuberculosis and Lung Diseases, 2013). in addition, the literatures on potential health risk remain scarce. Most of previous researches only focused examining the liquid on the cartridge instead of aerosol as a product of vaporization process (Pepper & Eissenberg, 2014). US Food and Drugs Administration (FDA) found the liquid from electronic cigarette's cartridge typically contained low level of carcinogenic. However, the dose of nicotine was diverse depending upon brand. There was also presence of diethylene glycol, a chemical compound that responsible for mass poisoning accident and death in many countries (Pepper & Eissenberg, 2014). Despite the carcinogenic consternation was considerable low compared to cigarette but one of most hazardous carcinogenic

compound (formaldehyde) could reach same level as cigarette if the electronic cigarette use high voltage battery to heat the liquid in the cartridge (Pepper & Eissenberg, 2014).

In general, any product containing nicotine might pose risk of nicotine poisoning for smoker (Callahan-Lyon, 2014). The nicotine of electronic cigarette aerosol inhaled by smoker would easily reach to bloodstream (Callahan-Lyon, 2014). A prior study found concentration of nicotine in electronic cigarette smoker was quite similar with those who smoked conventional cigarette in some circumstances (Callahan-Lyon, 2014). In addition, nicotine exertion (inhaled or ingestion) and direct contact with the skin in any level of concentration was hazardous to the health and safety particularly for vulnerable group including children, pregnant woman, elderly, people with CVD (Callahan-Lyon, 2014). According to existing report, health effect of electronic cigarette smoking were classified in low severity level such as cough, dry mouth, and headache (Pepper & Eissenberg, 2014). However, there was a case report of unexpected effect of electronic cigarette which caused serious illness like lipid pneumonia (McCauley, Markin, & Hosmer, 2012).

In summary, electronic cigarette attracts attention from public health community because of status quo in tobacco control. I can be tools for smoking cessation aid or a new gateway to smoking tobacco. Until now, long-term health effect of electronic cigarette remains unresolved. At the same time, evidence of efficacy of electronic cigarette as harm reduction or cessation aid isn't scientifically proven. However, electronic cigarette can potentially undermine the WHO Framework Convention on Tobacco Control (FCTC) and other existing tobacco control measure.

2.7 Theoretical

The following review will explore some major theories as a background of this research. As explained in chapter I, this research is going to seek how both individual and environment aspect interact and influence each other generating certain behavior. Social Cognitive Theory (SCT) (Tim Liputan6 SCTV) is a model

which probably the most commonly used by health educator to construct individual and social change (K. Glanz & Bishop, 2010).

2.7.1 Social Cognitive Theory

Social Cognitive Theory was coined by American Prominent Psychologist Albert Bandura (National Cancer Institute, 2005). Social Cognitive Theory describes the dynamic process of interaction between personal factors, environmental factors, and human behavior (Bandura & McClleland, 1977). The keys concept of SCT is grouped into five categories such as psychological determinant behavior, observational learning, environmental determinant of behavior, self-regulation, and moral disengagement (Karen Glanz, Rimer, & Visawanath, 2005).

The most powerful determinant in individual-level psychological is outcome expectation. It defines as the belief about the likelihood of the result an individual expect from the behavior that a person might act (National Cancer Institute, 2005). The basic idea comes from economic theory, people's acts tend to minimize cost and maximize benefit. The people behave aren't purely from their objective assessment but on their preference on it (Karen Glanz et al., 2005).

The superiority of human being compare to other animals is the capacity to perform learning skills. In SCT, observational learning is the center of model. It means that the behavior shaped by the process whereby people exposure to other individual or social experience rather than own experience (Karen Glanz et al., 2005). Human wouldn't change behavior unless there is environment to support new behavior. There are two approach to make new behavior easily adopt include incentive motivation and facilitation (Karen Glanz et al., 2005).

The endurance of human capacity to protect against negative behavior in can be achieved through self-regulation. The capacity of the people to control himself doesn't solely depend on will power but instead on possession of substantial skill to manage himself (Karen Glanz et al., 2005). Bandura indicate the idea of self-regulation defines as the skill to organize our own behavior

through self-monitoring, goal setting, feedback, self-reward, self-instruction, and enlistment of social support (Bandura & McClleland, 1977; Karen Glanz et al., 2005). SCT denoted that a certain moral standard for self-regulation will lead the people to avoid valance act to other. This moral standard could be violated through mechanism of moral disengagement (Karen Glanz et al., 2005). The figure bellow illustrated how individual and environmental factors interacts each other to form a certain behavior.

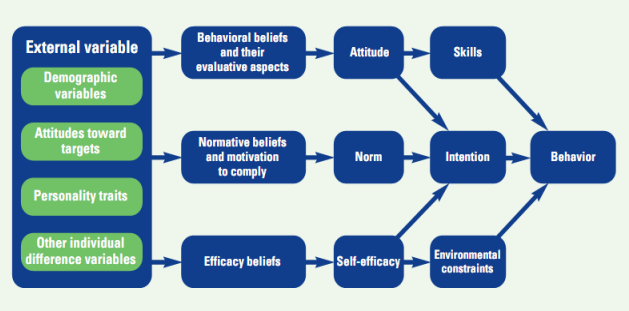

Figure 7: An Integrative Model of Social Cognitive Theory

Source: National Cancer Institute. 2005 (National Cancer Institute, 2005)

2.7.2 Theory Planed Behavior

The Theory Planed Behavior (TPB) or Theory of Reason Action (TRA) emphasizes on individual intention as the most important factors of the likelihood for someone performing a specific behavior. According to this model, behavior is produced by interaction between belief, attitude, and intention (National Cancer Institute, 2005). The intention is influenced by attitude toward performing behavior, and social normative perception regarding it. The distinction between TPB and TRA was TPB include one additional component perceived behavioral control (Karen Glanz et al., 2005).

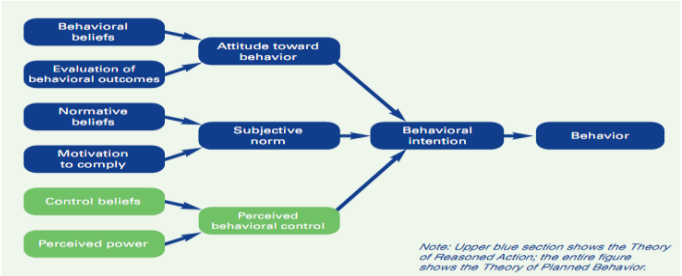

Figure 8: Theory of Planned Behavior and Theory of Reasoned Action

Source: National Cancer Institute. 2005 (National Cancer Institute, 2005)

The figure showed that behavioral intention shaped by attitude toward performing behavior, and subjective norm regarding the behavior. TPB adds one perceived control over behavior into the box into account in case behavior intention or behavior influenced by factors beyond people's control (Karen Glanz et al., 2005).

Attitude defines as personal own evaluation of the behavior. It is determined by individual belief upon outcome of performing a specific behavior, reinforced by evaluation of those outcomes. The subjective norm means the belief whether the key people approve or disapprove of the behavior, weighted by his motivation satisfy those reference people. Ultimately, perceived control is a person's perception of his ability to control over performing the behavior (Karen Glanz et al., 2005; National Cancer Institute, 2005).

2.8 Tobacco Control Policy in Indonesia

Tobacco control situation in Indonesia is still far from being satisfied. It never became priority agenda of public health before late 1990s (Achadi, Soerojo, & Barber, 2005). The first regulation on tobacco control in Indonesia was issued under the interim President BJ Habibie after people power step down President Soeharto (Thabrany, 2012). The government regulation number 81 years 1999 banned tobacco advertising in television, require written health warning, and limited nicotine and tar. This regulation seems the positive progress of tobacco control in Indonesia (Thabrany, 2012). However, the president only holds in power one and half year (Thabrany, 2012). President Abdurrahman Wahid as successor revised the regulation with weaker measure. He issued government regulation number 38 years 2000 which only banned tobacco ads in television from 5 am to 9.30 pm (Thabrany, 2012; Tobacco Control Support Center, 2012).

After 13 years with less restricted tobacco control regulation, President Susulo Bambang Yudhoyono issued new government regulation number 109 year 2012 (Tandilittin & Luetge, 2013). Despite it still didn't accordant with The FCTC, there were some progress in this regulations, such as prohibition sell cigarette to children under 18 years and pregnant woman, obligation to put on 40% pictorial health

warning on tobacco pack, and strengthen the smoke free regulation (Tandilittin & Luetge, 2013; Tobacco Control Support Center, 2013).

2.8.1 Smoke Free Area

Health Act number 36 year 2009 mentioned that smoke free area include health, education, child care, and religious facilities, public transportation, workplace, and public place as well (Tobacco Control Support Center, 2012). The fine would be levied to both building manager, and individual who violated the regulation (Tobacco Control Support Center, 2013). However this act would not be effective unless the local government enact the smoke free area bylaw (Tobacco Control Support Center, 2012).

Since 2009 after the regulation passed by parliament, some local government have enacted smoke free area bylaw (Tobacco Control Support Center, 2012). Fifteen cities have already protected by 100% smoke free regulation whose population was about 30 million, and 98 others at different stage of their own regulation (Aditama, 2014). In some city the regulation was beyond smoke free area (Tobacco Control Support Center, 2012). It also includes banning tobacco advertisement on billboard and others outdoor media (Tobacco Control Support Center, 2012, 2013). In some cities, the regulation was even weaker than WHO FCTC provision (Tobacco Control Support Center, 2012). It allowed the building manager to have smoking area inside the smoke free area (Tobacco Control Support Center, 2012, 2013).

2.8.2 Tobacco Advertising, Promotion, and Sponsorship

Currently, no policy totally banned tobacco advertising, promotion and sponsorship in Indonesia (Tobacco Control Support Center, 2012). Press Act number 40 year 199 only restricted advertising agency not to create tobacco ads which show off tobacco smoking activity (Tobacco Control Support Center, 2012, 2013). Similarity, Broadcasting Act number 32 year 2002 also prohibited broadcast commercial advertising to demonstrate smoking behavior on the content (Tobacco Control Support Center, 2012, 2013). Furthermore, the film act number 33 year 2009 didn’t clearly mention banning form of smoking

(Tobacco Control Support Center, 2012, 2013). It only prohibited the film encourage public to use addictive substance (Tobacco Control Support Center, 2012, 2013). Thus, the tobacco industry almost could freely use all channels promoting their deadly product to Indonesian people (Thabrany, 2012).

2.8.3 Graphical Health Warning

Health Minister Decree No. 28 Year 2013 was required Pictorial Health Warning on all tobacco product labels that have implemented on June 2014 (Tobacco Control Support Center, 2013). The size of the label was 40% in top of front and back of the package (Tobacco Control Support Center, 2013). There were be 5 pictures with full color rotated every 5 years (Tobacco Control Support Center, 2013). In addition, the massage on the warning should be delivered in Indonesian language, specific and clear for customer (Lian & Dorotheo, 2013; Tobacco Control Support Center, 2013). It prohibited making impression that some product can reduce harm (Tobacco Control Support Center, 2013). The law of graphic health warnings applied to products including manufactured domestically, imported, and for duty-free sale (Lian & Dorotheo, 2013; Tobacco Control Support Center, 2013).

2.8.4 Cigarette Tax and Price

Compare to other neighborhood country in ASEAN (Association of South East Asia Nation), cigarette price in Indonesia was relatively cheap. For instance, the price of an international cigarette brand in Indonesia was about 1.24 USD per pack while it costed 3.32 USD in Malaysia, 2.36 USD In Thailand, and 8.3 USD in Singapore (Lian & Dorotheo, 2013). The design of tobacco excises system contributed to make cigarette price cheaper (Barber & Ahsan, 2009). There was wide gap tax rate which generated variability of cigarette price. Therefore, consumer could change to cheaper product in response to increment of price (Barber & Ahsan, 2009).

In summary, there is absent of regulation on electronic cigarette and shisha product in Indonesia. The purpose of existing regulation still attempt to reduce

regular cigarette use instead of non-cigarette smoking. Thus, the electronic cigarette and shisha haven't belonged to public health agenda.

2.9 Related Research on Factors Associated to Shisha and Electronic Cigarette Smoking Behavior

Actually, it was difficult to generalize any phenomenon in one place to another place particularly when the socio-cultural was totally different. Unfortunately, the related research on shisha and electronic cigarette smoking were mostly taken place in western country. In addition, literatures of factors associated with shisha and electronic cigarette use are quite scarce. The literature review would help the researcher to build up theoretical framework and to justify independent variables. These were below some previous study related to factor associated with shisha and electronic cigarette smoking behavior:

Social influence: In Poland, High School and undergraduate student who ever used electronic cigarette smoker ware more likely to have parents and partners who smoked cigarette (Goniewicz & Zielinska-Danch, 2012). The result is quite similar with the survey in the US, adolescent who perceived positive image of electronic cigarette was associated with having parent smoking (P=0.02), and more friends smoked electronic cigarette (P=0.04) (Berg et al., 2015). For Shisha smoking, a national survey at large urban university found that past year shisha smoker were associated with perception of high social acceptance (OR=20.00, 95% CI=6.03, 66.30) and popularity image (OR=4.72, 95% CI=2.85, 7.82) (Primack et al., 2008).

Knowledge: a survey conducted in the US found that the university students who smoked shisha belief that it is less harmful compared to regular cigarette (Primack et al., 2008). The odds ratio of smoking shisha with low perceived harm opinion on shisha was 2.54 (Primack et al., 2008). For electronic cigarette, a survey in Great Britain reported that more than half of electronic cigarette smoker belief that electronic cigarette would help to cut down and even give up cigarette smoking entirely (P< 0.01) (Dockrell et al., 2013). About 40% of smokers said that electronic cigarette might be good for health by the smokers himself and secondhand smokers (Dockrell et al., 2013). Shisha smoking was obtained positive perception among

adolescent related to its taste and smell (Maziak, Eissenberg, et al., 2004). Similar with electronic cigarette, a survey among university student in Pakistan revealed a total of 59.8% from 450 respondent belief that shisha smoking is less hazardous effect compare to normal cigarette ($P < 0.05$) (Jawaid et al., 2008).

Cigarette smoking: a research in five high schools in Korea found the student who experienced smoking cigarette had significantly associated to electronic cigarette use ($P< 0.01$) with odds ratio 11.2 (CL 95%: 3.9-32.3) (Lee et al., 2014). A larger study in Poland also found that cigarette smoking status is associated with ever used and current used of electronic cigarette ($P< 0.05$) with odds ratio 29.5 (28.5–30.4), and 9.7 (9.1–10.3) respectively (Goniewicz & Zielinska-Danch, 2012). For shisha smoking, an online survey in Britain reported shisha smoke were significantly associated with cigarette smoking status ($P<0.01$). Ex-smoker and current cigarette smoker had higher odds of shisha smoke compare to people who never smoked cigarette (Grant, Morrison, & Dockrell, 2014).

Actually, no adequate study explained the accessibility of shisha and electronic cigarette. However, the researcher assumed that these variables also influence shisha and electronic cigarette smoking since factors associated with tobacco use in any forms among adolescent were relatively similar (US Department of Health and Human Services, 2012). These following paragraphs revealed previous finding to support the researcher's assumptions:

Accessibility: a 4-year longitudinal study of 1246 sixth grade student in The United States showed that the perceive availability of cigarette increased over 4 years cohort study with $P<0.001$ (Doubeni, Li, Fouayzi, & DiFranza, 2009). Moreover, 201% of students who had never smoked perceived easily to get cigarette (Doubeni et al., 2009). A cross cultural survey among 5870 eighth grade student in California and 6992 seventh to ninth grade student in Wuhan China also revealed that availability of cigarette was associated with smoking behavior among adolescent (Unger et al., 2002). The Californian adolescents were more likely to perceive easy to obtain cigarette (Unger et al., 2002). Then, the smoking prevalence

was significantly higher among Californian student that their counterpart in Wuhan (Unger et al., 2002).

A nationally representative survey of 8th, 10th, 12th grade student in various sub urban in America found that the real cigarette price was strong determinant of youth smoking (Tauras, Huang, & Chaloupka, 2013). The increment of cigarette would reduce smoking prevalence particularly among ethnic minority group, female, and lower socio economic status of youth population (Tauras et al., 2013). In addition, the study the study among teenagers in East Java Province Indonesia year 2004 showed that nearly half of the students who current smoker perceived that cigarette price were affordable (Sulistiowati & Martini, 2004). Among current smoker, 80% had always enough money to buy cigarette. The study also concluded that cigarette price was the enabling factors for smoking among adolescent (Sulistiowati & Martini, 2004).

From these literature reviewed, we could gain some lesson learned about factors associated with shisha and electronic cigarette smoking among adolescent. The decision of adolescent to uptake shisha and electronic cigarette may be affected by multiple factors including individual, family, peer group, and accessibility. Actually, these independent variables have not completed because the researcher didn't include the exposure of advertising, promotion and sponsorship into independent variable. In fact, tobacco advertising was the most effective tools to attract adolescent by delivering the exotic image of wealth and luxury (McCall, 2014). However, shisha and electronic cigarette are new emerging of tobacco smoking in Indonesia and still consumed by a limited group in big city. Thus, the researcher doesn't consider them as important factors influence shisha and cigarette smoking.

CHAPTER III

RESEARCH METHODOLOGY

The study aims to find out the prevalence of electronic cigarette and shisha smoking among high school student in Jakarta. The detail explanation of the research methodology will be presented into 14 parts as follow:

1. Study design
2. Study area
3. Study population
4. Sampling technique
5. Inclusion and exclusion criteria
6. Sample and sample size
7. Measurement tool
8. Validity and reliability
9. Data analysis
10. Ethical consideration

3.1 Study Design

This study was a school based survey with cross sectional descriptive design. Data was collected from April to May 2015.

3.2 Study Area

The study was conducted in Jakarta Province, capital city of Indonesia. Jakarta has 1 municipality or “Kabupaten” (Thousand Island Municipality), and 5 cities (East Jakarta City, Central Jakarta City, West Jakarta City, South Jakarta City, and North Jakarta City). The data was obtained from 14 schools all over Jakarta except Kepulauan Seribu Municipality.

3.3 Study Population

The population target was high school student in Jakarta. According to Ministry of Education and Culture, an estimated of 377,216 students are studying in 1,263 high schools; 627 are general & religious, and 636 are vocational school. A total 141 high school are located in Central Jakarta, 180 in North Jakarta, 276 in West Jakarta, 279 in South Jakarta, 384 in East Jakarta, and 3 in Thousand Island Municipality (Ministry of Education and Culture).

3.4 Sampling Technique

The sampling technique was multistage cluster random sampling. The sampling frame procedures were as follow:

1. All schools were categorized into geographical basis, downtown and suburban.
2. From each category, the researcher randomly selected eight schools. However, two schools from downtown area refused to participate.
3. Then, the researcher randomly took three classes from each selected school, one class from grade X, XII, and XII. However, School principals didn't allow collecting data from grade XII. Therefore, the researcher picked two classes from grade XI.
4. All of student from the selected class were invited to participate in this study.

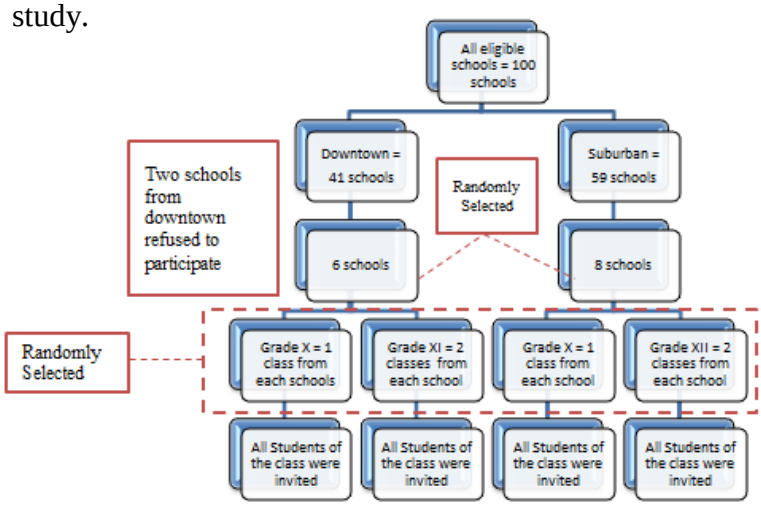

Figure 9: Sampling Frame

Total student in a class was about 20-36 person. In this case, the minimum estimation of respondent for this research was 36 classes x 25 = 900 persons and the maximum would reach 36 classes x 40 = 1,440 persons.

3.5 Inclusion Criteria

1. Both male and female students were invited to participate in this study
2. The students were from grad X to XII
3. Only student (15-19 years old) who were willing to participate included.

3.6 Exclusion Criteria

1. The students from private, vocational, religious, and International school.
2. The students who didn't attend at the class during data collection.
3. The students who admitted in school located in Thousand Island Municipality.
4. The students who enrolled in acceleration class.

3.7 Sample and Sample Size

Lemeshow formula was used to calculate sample size for estimating the proportion of sample (Lemeshow, Jr, Klar, & Lwanga, 1990). The detail formula was below:

$$n = \frac{N Z^2_{1-\alpha/2} P (1-P)}{(N-1) d^2 + Z^2_{1-\alpha/2} P (1-P)} X DEFF$$

n = Minimum number of sample size

N = total population = 377,516

Z score 95% = 1.96

d = Acceptable error = 0.05

P = Proportion of electronic and shisha smoking assumption = 0.05 (Lemeshow et al., 1990)

DEFF= Design Effect Assumption = 2 (Lemeshow et al., 1990)

$$n = \frac{377{,}516 \times 1.96^2 \times 0.065 \times (1-0.065)}{(377{,}516 - 1) \times 0.05^2 + 1.96^2 \times 0.065 \times (1-0.065)} \times 2 = 768$$

Since data collection used self-report method, there might be incomplete answer. In order to prevent shortage of sample, the researcher would add up the sample size by 10%. Thus, the total sample size would be at least 768+77 = 845.

3.8 Measurement Tools

The structure questionnaire was developed to collect the data. It was adapted from The WHO Global Youth Tobacco Survey version 1.0 July 2012, and other previous study related to tobacco use (Bigwanto, 2014; Brown et al., 2014; Jawaid et al., 2008). The core question questionnaire was consisted by eight parts as follow:

1. Socio-demographic:

The first part of questionnaire identified personal background of respondents including age, gender, class grade, school location, school performance by measuring grade point average, living arrangement, parent's education, parent's occupation, daily stipend (pocket money) obtain from respondent's parent. Detail explanation of each item as follows:

- Age was collected by providing the blank space (opened answer) for student to fill out his age.
- Gender classified into male and female.
- Grade classified into three options: 10^{th}, 11^{th} and 12^{th}.
- Grade point were collected by providing the blank space (opened answer)
- Living arrangement classified by 5 options; house with parents, living in relative's house, rent house, and an open question.
- Parent's highest education attainment separated into two questions for father and mother. Both question used 6 multiple choices answer from no education to graduate college.
- Parents' occupations were classified into nine options: no work, government worker, army or police, private sector, retirement, farmer, labor, entrepreneur, and other choice ended with open questions.
- Daily stipend referred to the amount of respondent's pocket money from his parent.

2. Electronic Cigarette Smoking

The electronic cigarette smoking was classified into four categories; Non-Smokers was those who never try smoke electronic cigarette in their life time, lifetime smoker was those whoever used at least one puff of electronic cigarette, past year smoker was those who smoked electronic cigarette in past year, and current smokers is those who smoke electronic cigarette during the past 30 days. In addition, the researcher also measured the frequency, quantity, age start smoking, and reason to start smoking. The questionnaire was adopted from the GYTS core question.

3. Shisha Smoking

This measurement tools to assess shisha smoking was taken from shisha module of GYTS core question. Shisha smoking behavior were divided four three groups among others; (1) Non-smokers for those who never tried shisha in their life even one puff, (2) lifetime smoker were those whoever tried shisha smoking, (4) past year smoker were those whoever smoked shisha in past year, and (3) current smoker were those whoever smoked shisha during past 30 days. In addition, the researcher also assessed the frequency, quantity, age initiating, reason initiating, and sharing shisha smoke with others.

4 Social Influence

The researcher adopted a questionnaire from GYTS and Bigwanto's (2014) to assess smoking behavior among influential person for respondents including father; mother, brother, sister, best friend, classmates, and teachers (Bigwanto, 2014).

5 Accessibility of Shisha and Electronic Cigarette Smoking

The researcher adopted GYTS questionnaire to assess the accessibility of shisha and electronic cigarette. The respondents were asked whether they could easily get shisha and electronic cigarette anytime and anywhere (availability). In addition, the researcher assessed affordability of shisha and electronic

cigarette by asking whether respondent perceived the price of shisha and electronic cigarette was affordable, and always had enough money to get those products.

6 Knowledge on health effect of shisha and electronic cigarette smoking

This variable was separated into two parts: electronic cigarette and shisha smoking. Six questions adopted from (Jawaid et al., 2008) were used to measure knowledge toward shisha smoking. The answers were formed by three Likert scale including true, false and don't know. The scoring method was false = 3, don't know =2, and true =1.

To determine the level of knowledge, the researcher use Bloom cut off point. The classification was <60% or 6-10 points = Low, 60-80% or 11-13 points = Moderate, and >80% or 14-18 points = High

For measuring knowledge on electronic cigarette, five questions adopted from (Brown et al., 2014) were asked to respondents. The answers were formed by three Likert scale including true, false and don't know. The scoring method was false = 3, don't know =2, and true =1.

To determine the level of knowledge, the researcher use Bloom cut off point. The classification was <60% or 6-9 points = Low, 60-80% or 10-12 points = Moderate, and >80% or 13-15 points = High.

7. Cigarette smoking use

Three questions adopted from Global Youth Tobacco Survey was used to measure cigarette smoking behavior (Global Youth Tobacco Survey Collaborative Group, 2012). Similar with shisha and electronic cigarette, cigarette smoking behavior were categorized into four categories; non-smokers for those who never tried cigarette in their life, lifetime smoker were those whoever tried at least one puff of cigarette, past year smoker were those who ever smoked cigarette in past year, and current smoker were those whoever smokes cigarette during past 30 days. In addition, this study looked for the

frequency and quantity of cigarette smoking; age and reason start smoking cigarette.

3.9 Validity and Reliability

The content validity was assessed by three experts from tobacco control field. The Item Objective Congruence score of this questionnaire were 0.858. For reliability of knowledge session on electronic cigarette and shisha, the researcher was conducting pilot to 36 high school students in Tangerang City prior the real data collection. The Cronbach's Alpha test was 0.794 for electronic cigarette and 0.828 for shisha.

3.10 Data Collection

The data was collected through self-report. It took place in Jakarta from April-May 2015. The procedure of data collection as follow:

1. A formal letter from College of Public Health Sciences sent to all school principle to seek permission for collecting the data.
2. The researchers hold training for research assistance. The research assistances were last year undergraduate student from faculty of public health.
3. The researcher and research assistance visited the school to collect data. To prevent interference learning activities, the data collection carried out during break time, free, or after class.
4. The researcher explained content of questionnaire and informs consent to the student. After that, research assistances disseminated inform consent form to all students who agreed to participate. Then, student filled the inform consent form and sent back to research assistance. One teacher attend in the class during obtaining inform consent process as a witness.
5. After signing informs concern, the researcher let teacher leave the room in order to prevent any pressure for student.
6. The research assistance disseminated questionnaire to all students then, the student completed all of the questions which approximately took 15 minutes.

7. After completing the questionnaire, the student sent back questionnaire to the research assistance. The research assistance kept and briefly checked to ensure all students fill the questionnaire completely before leaving the room.

3.11 Data Analysis

The data were analyzed by IBM SPSS version 21 software program. Univariate analysis was used to describe central tendency (mean, median), variability of the data (standard deviation), maximum and minimum, and mode of each variable by percentage.

Chi Square Test was used to measure association between shisha and electronic cigarette smoking behavior and each independent variable. In case, the data doesn't comply with Chi Square minimum assumption, the Fisher Exact test will be performed. The significant association was define as p value less than 0.05.

Multivariate analysis used by binary logistic regression with forward conditional mode to determine the strongest predictors of dependent variables.

3.12 Ethical Consideration

The study has minimal risk to the subjects. However, the smoking behavior was somewhat stigmatized behavior in school setting. Therefore, the researcher let the teacher stay outside class during the data collection in order to prevent students from any sanction because of their smoking behavior. In addition, the questionnaire were in anonymous format hence all information were surely confidential. The study obtained ethical approval from Institute of Research and Community Service, Atma Jaya Catholic University of Indonesia No: 404/III/LPPM-PM. 10. 05/04/2015.

CHAPTER IV

RESULT

This chapter is going to describe the frequency and percentage of respondent's demographic characteristic, social influence, accessibility, knowledge, pattern of cigarette smoking, pattern of shisha smoking, and pattern of electronic cigarette smoking, assess association between sociodemographic, social influence, accessibility, cigarette smoking status, and knowledge with shisha and electronic cigarette smoking, and find out predictors of shisha and electronic cigarette as well.

4.1 Characteristic of Respondent

Table 1. Characteristic of respondents

Demographic	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Age			
14-16	596 (71.9)	324 (66.1)	919 (69.7)
17-19	233 (28.1)	166 (33.9)	399 (30.3)
School location			
Suburban	491 (59.3)	287 (58.6)	778 (59)
Downtown	337 (40.7)	203 (41.4)	540 (41)
Grade (year)			
1st	281 (33.9)	40 (28.6)	421 (31.9)
2nd	547 (66.1)	350 (71.4)	897 (68.1)
GPA*			
≤ 7.9	157 (39.3)	114 (43.4)	271 (40.9)
≥ 8.0	242 (60.7)	149 (56.7)	391 (59.1)
Daily pocket money (IDR)**			
≤ 20,000	540 (71.4)	320 (70.6)	860 (71.1)
≥ 20,001	216 (28.6)	133 (29.4)	449 (28.9)

Table 1 Continued

Demographic	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Living arrangement			
None	37 (4.5)	27 (5.5)	64 (4.9)
Either	98 (11.8)	49 (10)	147 (11.2)
Both	693 (83.7)	414 (84.5)	1,107 (84)
Father's education			
≤ Primary	51 (6.2)	27 (5.5)	78 (5.9)
Secondary	462 (55.8)	253 (51.6)	715 (54.2)
Higher	315 (38)	210 (42.9)	525 (39.8)
Mother's education			
≤ Primary	86 (10.4)	30 (6.1)	116 (8.8)
Secondary	490 (59.2)	286 (58.9)	776 (58.9)
Higher	252 (30.4)	174 (35.5)	426 (32.3)
Father's occupation			
Not Working	57 (6.9)	43 (8.8)	100 (7.6)
Private Sector	645 (77.9)	360 (73.5)	1,005 (76.3)
Public Sector	126 (15.2)	87 (17.8)	213 (16.2)
Mother's occupation			
Not Working	539 (65.1)	290 (59.2)	829 (62.9)
Private Sector	211 (25.5)	151 (30.8)	362 (27.5)
Public Sector	78 (9.4)	49 (10)	127 (9.6)

**Missing data: 109, mean: 20,999, SD: 1,172, min: 4,000, max: 100,000*
*** Missing data: 656, mean: 7.9, SD: 0.055, min: 5, max: 9.8*

The table 1 showed sociodemographic characteristic of respondent by gender. Over half (62.8%) of respondents were woman and only 37.2% were man. A total of 62.7% students were categorized as under-age (<17 years old) according to national jurisdiction of Indonesia. The proportion of female under age students were slightly higher than male (71.9% vs 66.1%). The proportions of respondents from downtown school were not highly different from those who studying in suburban

regardless gender different, 41%, and 59% respectively. One third of respondents (31.9%) were sitting in the first year. The proportion of male respondent who enrolled in 2nd year grade were 71.4% which higher than female (66.1%). In terms of school achievement, over than half (59.1%) of student obtained good mark. Despite female tended to have higher GPA score compare to male but the proportion was not far different, 60.7% in female and 56.7% in male.

With regards to family background, the vast majority (84%) of respondents were under supervision both of the parents in home regardless gender different. The respondents generally came from moderate education family. Over half of parent finished secondary school, which were 54.2% for fathers and 58.9% of mothers. The proportion of male student who were from higher education parents were marginally higher than female. For parent's occupation, about three quarter (76.3%) of students had father who worked in private sector. More than half (62.9%) of mother were not currently working in any sector. Lastly, two third (71.1%) of respondents received daily pocket money about 1 USD (1 USD= 13,200 IDR).

Table 2. Characteristic of respondent by gender and school location

Demographic	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Age (Years)								
14-16	340	(69.2)	255	(75.7)	183	(63.8)	141	(69.5)
17-19	151	(30.8)	82	(24.3)	104	(36.2)	62	(30.5)
Grade (Year)								
1st	157	(32)	124	(36.8)	86	(30)	54	(26.6)
2nd	334	(68)	213	(63.2)	201	(70)	149	(73.4)
GPA*								
≤ 7.9	96	(44.9)	61	(33)	80	(55.2)	34	(28.8)
≥ 8.0	118	(55.1)	124	(67)	65	(44.8)	84	(71.2)

Table 2 Continued

Demographic	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Daily Pocket Money (IDR)*								
≤ 20,000	349	(77.4)	191	(62.6)	210	(78.9)	110	(58.8)
≥ 20,001	102	(22.6)	114	(37.4)	56	(21.1)	77	(41.2)
Living Arrangement (with parent)								
None	24	(4.9)	13	(3.8)	16	(5.6)	11	(5.4)
Either	54	(11)	44	(13.1)	28	(9.7)	21	(10.3)
Both	413	(84.11	280	(83.1)	243	(84.7)	171	(84.3)
Father's Education								
≤ Primary	32	(6.5)	19	(5.6)	15	(5.2)	12	(5.9)
Secondary	307	(62.5)	155	(45)	162	(56.5)	91	(44.8)
Higher	152	(31)	163	(48.4)	110	(38.3)	100	(49.3)
Mother's Education								
≤ Primary	64	(13)	22	(6.5)	16	(5.6)	14	(6)
Secondary	308	(62.7)	182	(54)	185	(65.4)	101	(49.7)
Higher	119	(24.3)	133	(39.5)	86	(30)	88	(43.3)
Father's Occupation								
Not Working	32	(6.5)	25	(7.4)	24	(8.4)	19	(9.3)
Private Sector	382	(77.8)	263	(78.1)	208	(72.5)	152	(74.9)
Public Sector	77	(15.7)	49	(14.5)	55	(19.1)	32	(15.8)
Mother's Occupation								
Not Working	318	(64.8)	221	(65.6)	171	(59.6)	119	(58.6)
Private Sector	123	(25)	88	(26.1)	80	(27.9)	71	(35)
Public Sector	50	(10.2)	28	(8.3)	36	(12.5)	13	(6.4)

**Missing data: 109 **Missing data: 656*

The table 2 reported sociodemographic characteristic of respondent by gender and school location. Students from downtown school were slightly younger than suburban. For instance, the proportion of underage female students in downtown

area was about 75.7% while in suburban reached to 69.2%. In terms of class grade, the proportion of male students who enrolled at second year was higher than freshman both in downtown and suburban area, 70.3% and 73.4% respectively. For school achievement, student from downtown school tended to have higher score compare to suburban area. About 71.2% of male students from downtown area obtained good marks while in suburban was only 44.8%.

Majority of respondents (> 80%) were living with parent regardless gender and school location. About 40% of student from downtown were having parents with higher education background. Afterwards, more than 90% of fathers were working. Among father who have job, about 70% were working in private sector. For mother occupation, there were over half (60%) not working in any institution currently. In respect to school location different, the proportions of receiving high pocket money were higher among downtown student (male: 37.9%, female 33.8%) while among suburban students were 20.7% in female and 19.5% in male.

4.2 Social Influence

Table 3. Smoking status among influential figures for respondents by gender

Smoking Status	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Father			
No	406 (49)	235 (48)	641 (48.6)
Yes	422 (51)	255 (52)	677 (51.4)
Mother			
No	788 (95)	471 (96.7)	1,262 (95.8)
Yes	40 (4.8)	16 (3.3)	56 (4.2)
Brother			
No	695 (83.9)	420 (85.7)	1,115 (84.6)
Yes	133 (16.1)	70 (14.3)	79 (15.4)
Sister			
No	807 (97.5)	481 (98.2)	1,288 (97.7)
Yes	21 (2.5)	9 (1.8)	30 (2.3)

Table 3 Continued

Smoking Status	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Close Friend			
No	276 (33.3)	61 (12.4)	337 (25.6)
Yes	552 (66.7)	429 (87.6)	981 (74.4)
Classmate			
No	162 (19.6)	93 (19)	255 (19.3)
Yes	666 (80.4)	397 (81)	1,063 (80.7)
Teacher			
No	82 (9.9)	44 (9)	126 (9.6)
Yes	746 (90.1)	446 (91)	1,192 (90.4)

Table 3 showed tobacco smoking status among most influential person of respondents by gender. Majority of students received negative influence from close friend, classmate and teacher. A total of 74.4% students reported having close friend who actively smoke tobacco. The vast majority (87.6%) of male respondents had close friend with smoking tobacco history while in female the proportion reached to 66.7%. In addition, only less than one fifth students had no classmate and teacher smoke tobacco, 18.2 and 7.4 respectively. In family setting, the subjects who revealed having father as a smoker (51.4%) were quite similar with non-smoker (48.6%). About 15.5% of students received bad smoking influence from brother. Ultimately, students obtained bad social influence from mother and sister were pretty small, 4.2% of mother and 2.3% of sister.

Table 4. Smoking status among influential figures for respondents by gender and school location

Smoking Status	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Father								
No	234	(47.7)	172	(51)	146	(50.9)	89	(43.8)
Yes	257	(52.3)	165	(49)	141	(49.1)	114	(56.2)
Mother								
No	472	(96.1)	316	(93.8)	279	(97.2)	195	(96.1)
Yes	19	(3.9)	21	(6.2)	8	(2.8)	8	(3.9)
Brother								
No	412	(83.9)	283	(84)	251	(87.5)	169	(83.3)
Yes	79	(16.1)	54	(16)	36	(12.5)	34	(16.7)
Sister								
No	480	(97.8)	327	(97)	283	(98.6)	198	(97.5)
Yes	11	(2.2)	10	(3)	4	(1.4)	5	(2.3)
Close Friend								
No	181	(36.9)	95	(28.2)	48	(16.7)	13	(6.4)
Yes	310	(63.1)	242	(71.8)	239	(83.3)	190	(93.6)
Classmate								
No	117	(23.8)	45	(13.4)	71	(24.7)	22	(10.8)
Yes	374	(76.2)	292	(86.6)	216	(75.3)	181	(89.2)
Teacher								
No	43	(8.8)	39	(11.6)	20	(7)	24	(11.8)
Yes	448	(91.2)	298	(88.4)	267	(93)	179	(88.2)

Table 4 showed smoking status among influential person for respondents by gender and school location. A total of 6.2% female students from downtown school were possessed to smoking influence by mother. The proportion of having active smoker brother was nearly same for all categories except in male student from

suburban school (12.5%). Generally, the exposures of tobacco smoking from close friend were higher in male students than female. More than 80% of male students were reported have close friend who actively smoke tobacco. However, the pattern was slightly different in classmate smoking variables. Students from downtown area tended to have more classmate smoking tobacco than suburban (about 75% vs 85%). For the teacher smoking influence, the proportion of student who have teacher smoker was higher in suburban than downtown, about 90%, and 88% respectively.

4.3 Pattern of Cigarette Smoking

Table 5. Prevalence of cigarette smoking by gender

Smoking Status	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Lifetime			
No	643 (77.7)	179 (36.5)	882 (62.4)
Yes	185 (22.3)	311 (63.5)	496 (37.6)
Past year			
No	718 (86.7)	304 (62)	1,022 (77.5)
Yes	110 (13.3)	186 (38)	296 (22.5)
Current			
No	758 (91.5)	347 (70.8)	1,105 (83.8)
Yes	70 (8.5)	143 (29.2)	213 (16.2)

Table 5 showed the prevalence of cigarette smoking by gender different. A total of 37.6% of students reported ever tried cigarette smoking at least one or two puffs in lifetime. The prevalence of lifetime cigarette smoking among male gender respondents were very high compare to female (63.5% vs 22.3%). Likewise, the overall prevalence of past year smoker was 22.5%. In terms of gender different, the prevalence of past year smoker among male were double compare to female, 13.3% and 38% respectively. The prevalence of past 30 days cigarette smoking (current) smoking) were 16.2%. Among male the proportion of current cigarette smoking were 29.2% while among female reached to 8.5%.

Table 6. Prevalence cigarette smoking by gender and school location

Cigarette Smoking	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Lifetime								
No	395	(80.4)	248	(73.6)	111	(38.7)	68	(33.5)
Yes	96	(19.6)	89	(26.4)	176	(61.3)	135	(66.5)
Past year								
No	440	(89.6)	278	(82.5)	188	(65.5)	116	(57.1)
Yes	51	(10.4)	59	(17.5)	99	(34.5)	87	(42.9)
Current								
No	452	(92.1)	306	(90.8)	212	(73.9)	135	(66.5)
Yes	39	(7.9)	31	(9.2)	75	(26.1)	68	(33.5)

Table 6 showed prevalence of cigarette smoking by gender and school location different. Male gender and studying in downtown school tended to have higher prevalence of cigarette smoking. About two third male students in Jakarta ever tried cigarette at least one time in a life, 61.3% of suburban and 66.5% of downtown. Among female, the prevalence was also higher in downtown than suburban school, 26.4% and 19.6% respectively. Likewise, a total of 42.9% of male student from downtown school reported ever used cigarette within past year, while in suburban reached to 34.5%. Among female, the prevalence of suburban students whoever smoked cigarette in past year were 10.4% and 17.5% in downtown. For current smoker (past 30 days user), the prevalence of cigarette smoking among male student reached to 33.5% in downtown and 26.1% in suburban school. Among female, the prevalence of was 9.2% and 7.9% in downtown and suburban school respectively.

Table 7. Amount and frequency of cigarette smoking among current user

Smoking Status	Female	Male	Total
	n (%)	n (%)	n(%)
Amount*	27	127	93
≤ 6 sticks	25 (92.6)	105 (82.7)	57 (61.3)
≥7 sticks	2 (7.4)	22 (17.3)	36 (38.7)
Frequency**	54	39	154
≤ 7 days	31 (57.4)	26 (66.7)	130 (84.4)
≥8 days	23 (42.6)	13 (33.3)	24 (15.6)

**Missing data: 99, mean: 4.89 **Missing data: 12*

Table 7 showed amount and frequency of cigarette smoking among past current cigarette user by gender. Over half (61.3%) of students reported used cigarette smoking more than 7 sticks in a day during previous 30 days. The vast majority (84.4%) of respondent revealed smoked cigarette in 7 days or less during past month. A total of 17.3% of male current cigarette user smoked more than 6 Packs in a day while in female were 7.4%. In contrary, about 52.6% of female past 30 days cigarette user smoked more than 8 days during previous month while in male reached 33.3%.

Table 8. Age and reason start smoking among lifetime user

Smoking Status	Female	Male	Total
	n (%)	n (%)	n(%)
Age start*	110	268	378
≤12 years old	39 (35.5)	98 (36.6)	137 (36.2)
13-15 years old	54 (49.1)	143 (53.3)	197 (52.1)
≥ 16 years old	17 (15.4)	27 (10.1)	44 (11.7)

Table 8 Continued

Smoking Status	Female	Male	Total
	n (%)	n (%)	n(%)
Reason start**	123	280	154
Persuaded by friend	5 (4.1)	47 (16.8)	53 (13.1)
Releasing stress	11 (8.9)	26 (9.3)	37 (9.2)
Curious	95 (77.2)	179 (63.9)	274 (67.8)
Other	12 (9.8)	28 (10)	40 (9.9)

** Missing data: 118, median:13 **Missing data: 92*

Table 8 showed age and reason start smoking among lifetime smoker by gender. Over half of respondent (52.1%) firstly tried cigarette during age of middle school. Furthermore, there was 36.2% started smoked at elementary school period (≤12 years old). Most of the respondents (67.8%) expressed reason start trying cigarette smoking because of curious. Male tended to start smoking earlier than female. However, the proportion of respondent who were firstly experimented cigarette during age of primary school was not largely different, 35.5% in female and 36.6% in male respectively. Friend appeared play more important role for influencing male student tried cigarette smoking than in female. A total of 16.8% male lifetime cigarette smoker reported initially smoked cigarette because of persuaded by friend. Afterwards, the proportion among female was only 4.8%.

4.4 Accessibility of Shisha and Electronic Cigarette Smoking

Table 9. Accessibility of shisha smoking

Accessibility	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Availability			
No	362 (43.7)	255 (45.9)	587 (44.5)
Yes	466 (56.3)	265 (54.1)	731 (55.5)
Affordability			
No	474 (57.2)	277 (56.5)	751 (57)
Yes	354 (42.8)	213 (43.5)	567 (43)

Table 9 Continued

Smoking Status	Female	Male	Total
	n (%)	n (%)	n(%)
Have enough money to buy			
No	558 (67.4)	324 (66.1)	882 (66.9)
Yes	270 (32.6)	166 (33.9)	436 (33.1)

Table 9 showed accessibility of shisha smoking by gender. Over half of respondents (55.5%) perceived easily to get shisha anywhere and anytime they want. Moreover, almost half of subjects (43%) thought the price was affordable but only 33.1% reported always have enough money to buy. There was no largely different of proportion in terms of all accessibility variables between gender (male vs female)

Table 10. Accessibility of electronic cigarette smoking

Accessibility	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Availability			
No	506 (61.1)	300 (61.2)	806 (61.2)
Yes	322 (38.9)	190 (38.8)	512 (38.8)
Affordability			
No	608 (73.4)	347 (70.8)	955 (72.5)
Yes	220 (26.6)	143 (29.2)	363 (27.5)
Have enough money to buy			
No	649 (78.4)	372 (75.9)	1,021 (77.5)
Yes	179 (21.6)	118 (24.1)	297 (22.5)

Table 9 showed accessibility of electronic cigarette smoking by gender. About one third (38.8%) respondents thought electronic cigarette smoking were easily available anytime and anywhere. About quarter of respondents believed that the electronic cigarette price is affordable and have always enough money to buy,

27.5% and 22.5% respectively. In regards to gender different, male tended to have more access to buy electronic cigarette. Among male, 29.2% of respondent believed electronic cigarette is affordable and 24.1% of them tough have always enough money to buy. However, the proportions of perceived availability were quite similar, 38.9% in female and 38.8% in male.

Table 11. Accessibility of shisha smoking by gender and school location

Access	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Availability								
No	239	(48.7)	123	(36.5)	148	(51.6)	77	(37.9)
Yes	252	(51.3)	214	(63.5)	139	(48.4)	126	(62.1)
Affordability								
No	302	(61.5)	172	(51)	177	(61.7)	100	(49.3)
Yes	189	(38.5)	165	(49)	110	(38.3)	103	(50.7)
Have Enough Money to Buy								
No	355	(72.3)	203	(60.2)	202	(70.4)	122	(60.1)
Yes	136	(27.7)	134	(39.8)	85	(29.6)	81	(39.9)

Table 11 showed accessibility of shisha smoking by gender and school location. Among downtown student, 63.5% of female and 62.1% of male student perceived shisha smoking was easily available anywhere and anytime. Interestingly, female student perceived easier access to get shisha instead of male. In suburban school, the proportion of easy access to buy shisha was 51.3% in female and 48.4% in male from suburban school respectively. However, perceived affordability of shisha smoking was nearly similar For instance, about one third (38.3%) of male student from downtown school though it was affordable while in female was 38.5%. The pattern was also found in perceived having enough money to buy. The proportion of student who thought always have enough money to buy shisha was 39.9% in male, and 39.8% in female student from downtown school respectively.

Table 12. Accessibility of electronic cigarette smoking by gender and school location

Access	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Availability								
No	312	(63.5)	194	(57.6)	177	(61.7)	123	(60.6)
Yes	179	(36.6)	143	(42.4)	110	(38.3)	80	(39.4)
Affordability								
No	365	(74.3)	243	(72.1)	208	(72.5)	139	(68.6)
Yes	126	(25.7)	94	(27.9)	79	(27.5)	64	(31.5)
Have Enough Money to Buy								
No	394	(80.2)	255	(75.7)	229	(79.8)	143	70.4)
Yes	97	(19.8)	82	(24.3)	58	(20.2)	60	(29.6)

Table 11 showed accessibility of electronic cigarette smoking by gender and school location. About 63.5% of female student from suburban school perceived electronic cigarette were not available anytime and anywhere. In contrary, female downtown student perceived having highest access (42.4%). In terms of affordability, about one third (31.5%) of Downton male students school thought electronic cigarette was affordable and 29.56% of them perceived always enough money to buy. Similarly, electronic cigarette was more affordable for female student from downtown than suburban school, 27.9% and 25.7% respectively. The gap was even greater in perceiving have money to buy variable. A total of 24.33% of downtown female students reported always have money to buy electronic cigarette while among were suburban male students 20.2%.

4.5 Knowledge on Health Effect of Shisha and Electronic Cigarette Smoking

Table 13. Knowledge on health effect of shisha smoking

Knowledge on Shisha	True n(%)	Don't Know n(%)	False n(%)
Shisha is harmless than cigarette	174 (13.2)	797 (60.5)	347 (26.3)
Fruit flavor in shisha detoxifies the smoke.	105 (8)	980 (74.4)	233 (17.7)
Shisha contains less nicotine than cigarettes.	246 (18.7)	927 (70.3)	145 (11)
Less frequency of use limits the side effect of shisha.	229 (17.4)	985 (74.7)	104 (7.9)
Shisha is less irritating to the respiratory tract than cigarettes.	167 (12.7)	1,014 (76.9)	137 (10.4)
Shisha contains less carcinogenic than cigarette	128 (9.7)	1,050 (79.7)	140 (10.6)

Table 12 shows the knowledge of Shisha Smoking. There were 13.2% of students believed shisha was harmless compare to cigarette. A total of 18.7% students agreed that shisha contained less nicotine than cigarette. In addition, a total of 17.4% of student thought that less frequency of use limited the side effect of shisha, and 12.7 % hold that shisha was less irritation to the tract than cigarette. Furthermore, 17.7 % of subjects stated that fruit flavor of shisha doesn't detoxified the smoke, and 10.6% were sure that shisha contained higher carcinogenic than cigarette.

Table 14. Knowledge on health effect of shisha smoking by gender and school location

Knowledge	Female (n=828)		Male (n=490)	
	Suburban	Downtown	Suburban	Downtown
	n=491 (%)	n=337 (%)	n=287 (%)	n=203 (%)
Shisha is harmless than cigarette				
True	59 (12)	50 (14.8)	31 (10.8)	34 (16.7)

Table 14 Continued

Knowledge	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Fruit flavor in shisha detoxifies the smoke								
True	29	(5.9)	25	(7.4)	28	(9.8)	23	(11.3)
Shisha contains less nicotine than cigarette								
True	64	(13)	68	(20.2)	54	(18.8)	60	(29.6)
Less frequency of shisha use limits the side effects								
True	69	(14)	67	(19.9)	49	(17.1)	44	(21.7)
Shisha is less irritating to the respiratory tract than cigarette								
True	44	(9)	43	(12.8)	33	(11.5)	46	(22.7)
Shisha contains less carcinogenic than cigarette								
True	41	(8.3)	31	(9.2)	23	(8)	33	(16.3)

Table 14 showed the knowledge on harmful effect of shisha smoking by gender and school location. There were 16.7% of male students from downtown school believed shisha was safer than cigarette. Likewise, about 5.9% of female students from suburban school perceived fruit flavor in shisha can detoxified the smoke. A total of 29.6% of male students from downtown school students agreed shisha contains less nicotine than combustible cigarette. In addition, about 19.9% of female students from downtown school thought less frequency of use would limit the side effect of shisha, and 12.8% hold that shisha was less irritating to the tract compare to regular cigarette. Furthermore, a total of 16.26% of male student from downtown school perceived that that shisha contained higher carcinogenic compound than regular cigarette.

Table 15. Knowledge on health effect of electronic cigarette smoking

Knowledge on Ecig	True n(%)	Don't Know n(%)	False n(%)
Electronic cigarette make easier to cut down amount of cigarette smoking.	163 (12.4)	796 (60.4)	359 (27.2)
Electronic cigarette might help to quit smoking cigarette.	125 (9.5)	769 (58.4)	424 (32.2)
Electronic cigarette do not contain any of the toxic chemicals like in combustible cigarettes.	112 (8.5)	941 (71.4)	265 (20.1)
Electronic cigarette is less harmful than regular cigarette.	141 (10.7)	885 (67.1)	292 (22.2)
Electronic cigarette is less addictive than regular cigarette.	142 (10.8)	1,040 (78.9)	136 (10.3)

Table 15 showed knowledge on health effect of electronic cigarette smoking. Similar with Shisha, most of students didn't have any idea about side effect of electronic cigarette. One third of respondents (32.2%) believed that electronic cigarette wouldn't be helpful to quit cigarette smoking however 12.6% of them confident electronic cigarette would make easier to cut down amount of cigarette smoking. More than one fifth (20.1%) respondents agreed electronic cigarette contains similar toxicants. A total of 22.2% students weren't convinced electronic cigarette is less harmful than cigarette. Ultimately, students who perceived electronic cigarette less addictive than regular cigarette were 10.8%.

Table 16. Knowledge on health effect of electronic cigarette smoking by gender and school location

Knowledge	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Electronic cigarette make easier to cut down amount of cigarette smoking.								
True	45	(9.2)	44	(13.1)	31	(10.9)	43	(21.2)
Electronic cigarette might help you quit smoking cigarette								
True	30	(6.1)	36	(10.7)	26	(9.1)	33	(16.3)
Electronic cigarette doesn't contain any of the toxic chemicals like in combustible cigarettes								
True	35	(7.1)	24	(7.1)	28	(9.8)	25	(12.3)
Electronic cigarette is less harmful than regular cigarette								
True	38	(7.7)	45	(13.3)	25	(8.7)	33	(16.3)
Electronic cigarette is less addictive than regular cigarette								
True	25	(5.1)	43	(12.8)	36	(12.5)	38	(18.7)

Table 16 showed knowledge on health effect of electronic cigarette smoking by gender and school location. Over half of students were not sure efficacy of electronic cigarette to aid cut down amount of cigarette smoking and smoking cessation. However, there were 21.2% of male students from downtown school confident that electronic cigarette make easier to cut down amount of cigarette smoking. This statement was also supported by 10.8% male student from suburban, 13.1% female students from downtown, and 9.2% suburban female students. In addition, there were 16.26% of male students from downtown school, 9.1% of male suburban, 10.7% of female from downtown, and 6.1% of suburban female students confidence electronic cigarette would be helpful to quit cigarette smoking. A total of 23.4% female student from downtown school convinced that electronic cigarette contain any of the toxic chemical that can be found in combustible cigarette. Likewise, the proportion of student who disagree that electronic cigarette is less harmful than regular cigarette is very small (7.7%) in female students from suburban schools, but most of them (87.8%) were not sure with harmful effect of

electronic cigarette. Moreover, the proportions of male student who believe addictiveness of electronic cigarette were less than combustible cigarette, 18.7% in downtown and 12.5% in suburban school respectively. Among female, 12.8% students from downtown school agree electronic cigarette is less addictive than regular cigarette.

4.6 Pattern of Shisha Smoking

Table 17. Prevalence of shisha smoking

Smoking Status	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Lifetime			
No	713 (86.1)	334 (68.2)	1,047 (79.4)
Yes	115 (13.9)	156 (31.8)	271 (20.6)
Past year			
No	738 (89.1)	376 (76.7)	1,114 (84.5)
Yes	90 (10.9)	114 (23.3)	204 (15.5)
Current			
No	801 (96.7)	449 (91.6)	1,250 (94.8)
Yes	27 (3.3)	41 (8.4)	68 (5.2)

Table 17 showed prevalence of shisha smoking by gender. One fifth (20.6%) of students reported ever tried shisha at least one times in life. There were 15.5% of responded smoking shisha within past year. However, the prevalence of past 30 days smoker considerably decreased. A total of 5.2% students reported ever experimented shisha smoking during past month. The prevalence of male smoker were always double than female in all categories. The prevalence of lifetime, past year and past 30 days shisha smoker among male were 31.8%, 23.3%, and 13.9% respectively. About 13.9% of female respondent reported ever tried shisha smoking at least one time in life. Afterwards, the prevalence of past year smoker were slightly decrease, 10.9%. Furthermore, the prevalence of past 30 days shisha user were very small which were 3.3%.

Table 18. Prevalence of shisha smoking by gender and school location

Smoking Status	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Lifetime								
No	445	(90.6)	268	(79.5)	221	(77)	113	(55.7)
Yes	46	(9.4)	69	(20.5)	66	(23)	90	(44.3)
Past year								
No	454	(92.5)	284	(84.3)	234	(81.5)	142	(70)
Yes	37	(7.5)	53	(15.7)	53	(18.5)	61	(30)
Current								
No	479	(97.6)	322	(95.5)	265	(92.3)	184	(90.6)
Yes	12	(2.4)	15	(4.5)	22	(7.7)	19	(9.4)

Table 18 showed the prevalence of shisha smoking. Student who admitted in downtown school tended to have higher prevalence than. For instance, the prevalence of lifetime shisha smoking among female students was 20.5% and 9.4% in downtown and suburban respectively. Among male, students from suburban who reported ever experimented shisha smoking at least one time in life reached to 23% while the prevalence was almost double (44.3%) in downtown students. The prevalence of past year shisha smoking among male students remained higher in downtown than suburban which were 30% and 18.5% respectively. Likewise, the prevalence among female students who smoked shisha during past year from downtown school was also higher than suburban students, 15.7% and 7.5% respectively. For past 30 days user, Despite male students from downtown schools still placed at the highest prevalence, it had extensively decrease to 9.4% which wasn't far from suburban students (7.7%). Among female, the prevalence of students who used shisha within past 30 days were remained doubled different between suburban and downtown school, 2.4% and 4.5% respectively.

Table 19. Amount and frequency of shisha smoking among current user

Shisha Smoking	Female	Male	Total
	n (%)	n (%)	n(%)
Amount*	34	58	92
≤ 1 session	29 (85.3)	39 (67.2)	68 (73.9)
≥2 sessions	5 (14.7)	19 (32.8)	24 (26.1)
Frequency**	13	11	24
≤ 4 days	9 (69.2)	8 (72.7)	17 (70.8)
≥5 days	4 (30.8)	3 (27.3)	7 (29.2)

**Missing data: 44, median: 1, SD: 2.265, min: 1, max: 8*
***Missing data: 33, median: 1.86, SD: 1.115, min: 1, max: 5*

Table 19 showed amount and frequency of shisha smoking among past 30 days user. The average amount of shisha smoking among current shisha smoker was 1 sessions in a day. Nearly three quarter (73.9%) of respondents smoked 1 session in a day during past month. In terms of frequencies, about 70.8% of students spent four days or less in a month to smoke shisha.

Table 20. Age and reason start smoking shisha among lifetime user

Shisha Smoking	Female	Male	Total
	n (%)	n (%)	n(%)
Age start*	92	131	223
≤15 years old	61 (66.3)	101 (77.1)	162 (69.5)
≥ 16 years old	31 (33.7)	30 (22.9)	61 (26.2)
Reason start**	97	141	238
Persuaded by friend	9 (9.3)	16 (11.3)	25 (10.5)
Curious	67 (69.1)	83 (58.9)	150 (63)
Look tasty	8 (8.2)	12 (8.5)	20 (8.4)
Other	13 (13.4)	30 (21.3)	43 (18.1)

**Missing data: 48, median:15 SD: 1.454, min:6, max:17 **Missing data: 92*

Table 19 explained age and reason start shisha smoking among lifetime user. Over half (69.5%) of lifetime users experimented shisha smoking at the first time

was during age of middle school period. More than one third (63%) of student reported trying shisha smoking because of curious.

4.7 Pattern of Electronic Cigarette Smoking

Table 21. Prevalence of electronic cigarette smoking

Smoking Status	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Lifetime			
No	777 (93.8)	348 (71)	1,125 (85.4)
Yes	51 (6.2)	142 (29)	193 (14.6)
Past year			
No	782 (94.4)	371 (75.7)	1,153 (87.5)
Yes	46 (5.6)	119 (24.3)	165 (12.5)
Current			
No	823 (99.4)	450 (91.8)	1,273 (96.6)
Yes	5 (0.6)	40 (8.2)	45 (3.4)

Table 21 showed the prevalence of electronic cigarette smoking. The result revealed a total of 14.6% respondents ever experimented electronic cigarette at least one puff in life. In addition, there were 12.5% of students reported smoked electronic cigarette in past years. For past 30 days user, the prevalence reached to 3.4%. Generally, the prevalence of male electronic cigarette smoker was five times higher than female. For instance, the prevalence of lifetime smoker among male and female were 29% and 6.2% respectively. For the past year smoker, the prevalence were 24.3% in male and 5.6% in female. Ultimately, a total of 8.2% male reported tried electronic cigarettes during previous 30 days while in female were only 0.6%.

Table 22. Prevalence of electronic cigarette smoking by gender and school location

Smoking Status	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Lifetime								
No	445	(90.6)	268	(79.5)	221	(77)	113	(55.7)
Yes	46	(9.4)	69	(20.5)	66	(23)	90	(44.3)
Past year								
No	454	(92.5)	284	(84.3)	234	(81.5)	142	(70)
Yes	37	(7.5)	53	(15.7)	53	(18.5)	61	(30)
Current								
No	479	(97.6)	322	(95.5)	265	(92.3)	184	(90.6)
Yes	12	(2.4)	15	(4.5)	22	(7.7)	19	(9.4)

Table 22 explained the prevalence of electronic cigarette smoking. A total of 36.5% of male students from downtown school were considered as lifetime electronic cigarette smoker. The lowest prevalence was in suburban female students which were 4.3%. For the prevalence of past year smoking, about 3.9% of female student from suburban school and 8% in downtown considered as past year electronic cigarette smoker. For male students, the prevalence of past year electronic cigarette smoker experienced 4% decreased with the total prevalence reached to 32.5% in downtown and 18.5% in suburban students respectively. Prevalence of current smoker was small in all categories except male from downtown schools that reached to double digits (11.3%). Prevalence of male suburban were nearly half (5.9%) from male student from downtown school. For female student, prevalence was considerably low (less than 1%) in both downtown and suburban school, 0.4% and 0.9% respectively.

Table 23. Amount and frequency of electronic cigarette smoking among current user

Smoking Status	Female	Male	Total
	n (%)	n (%)	n(%)
Amount*	6	51	92
≤ 9 milliliters	3 (50)	32 (62.7)	68 (73.9)
≥10 milliliters	3 (50)	19 (37.3)	24 (26.1)
Frequency**	2	19	21
≤ 4 days	1 (50)	13 (68.4)	14 (66.7)
≥5 days	1 (50)	6 (31.6)	7 (33.3)

** Missing data: 22, mean:9, SD: 12,61, min:5, max:30*

***Missing data: 28, median: 3, SD: 10.362, min: 1, max: 30*

Table 23 indicated the amount and frequency of electronic cigarette smoking among current user. The average amount of shisha smoking among current shisha smoker was 9 milliliters in a day during past month. Nearly three quarter (73.0%) of current user smoked 9 milliliters or less in a day during past 30 days. There were 33.3% of current electronic cigarette smoker used it more than 5 days within previous month. Interestingly, the amount and frequency of electronic cigarette use among female were larger than male. However, it is surely doesn't explain the real situation in the field because the proportion may relate with inadequate cases found.

Table 24. Age and reason start electronic cigarette smoking among lifetime user

Smoking Status	Female	Male	Total
	n (%)	n (%)	n(%)
Age start*	48	131	179
≤15 years old	17 (35.4)	65 (49.6)	82 (45.8)
≥ 16 years old	31 (64.6)	66 (50.4)	97 (54.2)

Table 24 Continued

Smoking Status	Female	Male	Total
	n (%)	n (%)	n(%)
Reason start**	50	133	183
Persuaded by friend	4 (8)	13 (9.8)	17 (9.3)
Curious	38 (76)	95 (71.4)	133 (72.7)
Look tasty	5 (10)	4 (3)	9 (4.9)
Other	3 (6)	21 (15.8)	24 (13.1)

**Missing data: 14, median: 16, SD: 1.143, min: 9, max: 18 **Missing data: 19*

Table 24 showed age and reason start smoking electronic cigarette among lifetime user. Unlike shisha smoking, the proportion of those who start smoking at the age of middle school and high school were nearly same similar. Similar with shisha smoking, male tended to start smoking electronic cigarette earlier than female. The proportion of those who started trying electronic cigarette at the aged 16 years or more reached to 54.2%. There were 72.7% of respondents reported curious as the main factor trying electronic cigarette. The main of reason start smoking electronic cigarette were same between male and female.

4.8 Prevalence of Dual Use Electronic Cigarette and Shisha

Table 25. Prevalence of dual use shisha and electronic cigarette

Smoking Status	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Lifetime			
No	794 (95.9)	385 (78.6)	1,179 (89.5)
Yes	34 (4.1)	105 (21.4)	139 (10.5)
Past year			
No	801 (96.7)	417 (85.1)	1,218 (92.6)
Yes	27 (3.3)	73 (14.9)	100 (7.4)

Table 25 Continued

Smoking Status	Female (n=828)	Male (n=490)	Total (n=1,318)
	n (%)	n (%)	n(%)
Current			
No	825 (99.6)	478 (97.6)	1,303 (98.9)
Yes	3 (0.4)	12 (2.4)	15 (1.1)

Table 25 showed the prevalence of dual use shisha and electronic cigarette. A total of 10.5% respondents reported ever experimented both shisha and electronic cigarette at least one time. There are 7.6% student tried it within past year. In addition, about 1.1% used both shisha and electronic cigarette during past 30 days. Generally, the prevalence of dual use shisha and electronic cigarette were 5 times higher in male than female regardless categories

Table 26. Prevalence of dual use shisha and electronic cigarette by gender and school location

Smoking Status	Female (n=828)				Male (n=490)			
	Suburban		Downtown		Suburban		Downtown	
	n=491	(%)	n=337	(%)	n=287	(%)	n=203	(%)
Lifetime								
No	476	(96.9)	318	(94.4)	242	(84.3)	143	(70.4)
Yes	15	(3.1)	19	(5.6)	45	(15.7)	60	(29.6)
Past year								
No	477	(97.1)	324	(96.1)	254	(88.5)	163	(80.3)
Yes	14	(2.9)	13	(3.9)	33	(11.5)	40	(19.7)
Current								
No	489	(99.6)	336	(99.7)	278	(98.5)	200	(97.6)
Yes	2	(0.4)	1	(0.3)	9	(1.5)	3	(2.4)

Table 26 indicated prevalence of dual use shisha and electronic cigarette by gender and school location. Among female, the prevalence of lifetime both use of

shisha and electronic cigarette were nearly double between downtown and suburban, 5.6% and 3.1% respectively. The prevalence of past year dual use of electronic cigarette and shisha decreased by half among female student from downtown, male suburban and downtown, 3.9%, 11.5%, and 19.7% respectively. The prevalence among female in suburban was little bit more than downtown school, 0.4% and 0.3% respectively. Among male, the prevalence in downtown students were 2.4% while in suburban reached to 1.5%.

4.9 Association between Sociodemographic Characteristic with Shisha and Electronic Cigarette Smoking

Table 27. Association between sociodemographic with shisha smoking

Demographic Characteristic	Shisha Smoker			
	n=271	(%)	Crude OR (CI=95 %)	P value
Gender				**<0.001**
Female	115	(13.9)	1	
Male	156	(31.8)	2.896 (2.202-3.808)	
Age (years)				0.462
15-16	184	(20)	1	
≥ 17	87	(21.8)	1.114 (0.836-1.485)	
School Location				**<0.001**
Suburban	112	(13.8)	1	
Downtown	159	(28.9)	2.482 (1.889-3.259)	
Class Grades (year)				0.211
First	78	(18.5)	1	
Second	193	(21.5)	1.206 (0.899-1.616)	
GPA				0.603
5.0-7.9	60	(22.1)	1	
> 8.0	80	(20.5)	0.905 (0.62-1.32)	
Daily Pocket Money (IDR)				**<0.001**
≤ 20,000	144	(16.7)	1	
≥ 20,001	100	(28.7)	1.997 (1.49-2.677)	

Table 28 *(Continued)*

Sociodemographic	Shisha Smoker			
	n=271	(%)	Crude OR (CI=95 %)	p value
Living Arrangement (with parent)				
None	14	(21.9)	1	0.888
Either	32	(21.8)	0.878 (0.428-1.801)	
Both	225	(20.3)	0.886 (0.481-1.631)	
Father's Education				**0.002**
≤ Primary	16	(20.5)	1	
Secondary	122	(17.1)	0.797 (0.445-1.428)	
Higher	133	(25.3)	1.315 (0.733-2.357)	
Mother's Education				
≤ Primary	18	(15.5)	1	**0.027**
Secondary	148	(19.1)	1.283 (0.753-2.188)	
Higher	105	(24.6)	1.781 (1.029-3.083)	
Father's Occupation				
Not working	19	(19)	1	0.486
Private Sector	214	(21.3)	1.153 (0.684-1.944)	
Public Sector	38	(17.8)	0.926 (0.503-1.704	
Mother's Occupation				0.852
Not working	168	(20.3)	1	
Private Sector	78	(21.5)	1.081 (0.799-1.462)	
Public Sector	25	(19.7)	0.964 (0.603-1.514)	

In regards to individual characteristic, male gender student were more likely to smoke shisha (OR: 2.896, 95% CI: 2.202-3.808) while no significant association was found with the age of respondent (p >462). The respondents who study at downtown area were 2.482 times higher odds to smoke shisha than those in suburban area (95% CI: 1.889-3.259). School grade and latest GPA score didn't have significant association with shisha smoking (P> 0.05). In terms of family background, there was no significant association found between living arrangements with shisha smoking (P> 0.05).

Generally, the odds of being shisha smoker increased in accordance with father's and mother's education. The students who had parents graduated from higher education institution were more likely to tried electronic cigarette than who graduated from elementary school or no education with odds ratio 1.315 (95% CI: 0.733-2.357)and 1.781 (95% CI: 1.029-3.083) respectively. In addition, there was different result found for those whose father graduated from secondary school. Student with having father graduated from secondary school was less likelihood to become shisha smoker (OR: 0.797, 95% CI: 0.445-1.428) than less educated father. In contrary, the odds of mother who pass secondary school were 1.283 (95% CI: 0.753-2.188). There was no statistical significant different between shisha smoking with both father and mother occupation ($p<0.05$). Ultimately, the result shows the odds for being shisha smoker will be higher when the daily pocket money also increases. The subjects which had daily pocket money IDR > 20,000 have 1.997 times more likely to experiment shisha (95% CI: 1.49-2.677).

Table 28. Association between sociodemographic with electronic cigarette smoking

Demographic	**Electronic Cigarette Smoker**			
	n=193	**(%)**	**Crude OR (CI=95 %)**	**p value**
Gender				**<0.001**
Female	51	(6.2)	1	
Male	142	(29)	6.217 (4.407-8.769)	
Age (years old)				**0.05**
15-16	123	(13.4)	1	
≥ 17	70	(17.5)	1.377 (1-1.897)	
School Location				**<0.001**
Suburban	89	(11.4)	1	
Downtown	104	(80.7)	1,847 (1.358-2.511)	
Class Grades				0.542
First Year	58	(13.8)	1	
Second Year	135	(15.1)	1.109 (0.795-1.546)	

Table 28 (Continued)

Sociodemographic	Electronic Cigarette Smoker			
	n=271	(%)	Crude OR (CI=95 %)	p value
GPA				0.16
5.0-7.9	46	(17)	1	
≥ 8.0	51	(13)	0.734 (0.476-1.131)	
Daily Pocket Money (IDR)				**<0.001**
≤ 20,000	103	(12)	1	
≥ 20,001	71	(20.3)	1.877 (1.347-2.616)	
Living Arrangement (with parents)				0.5
None	12	(18.8)	1	
Either	24	(16.3)	0.846 (0.393-1.817)	
Both	157	(14.2)	0.716 (0.374-1.372)	
Father's Education				**0.016**
≤ Primary	7	(9)	1	
Secondary	92	(12.9)	1.498 (0.669-3.356)	
Higher	94	(17.9)	2.212 (0.986-4.962)	
Mother's Education				**0.008**
≤ Primary	9	(7.8)	1	
Secondary	106	(13.7)	1.881 (0.924-3.827)	
Higher	78	(18.3)	2.665 (1.293-5.492)	
Father's Occupation				0.945
Not working	14	(14)	1	
Private Sector	149	(14.8)	1.069 (0.592-1.931)	
Public Sector	30	(14.1)	1.007 (0.508-1.996)	
Mother's Occupation				**0.03**
Not working	107	(12.9)	1	
Private Sector	68	(18.8)	1.561 (1.119-2.177)	
Public Sector	18	(14.2)	1.114 (0.65-1.909)	

Table 28 showed association between electronic cigarette smoking with sociodemographic characteristic. there was significant association between gender

with electronic cigarette smoking (p<0.001). Being male students had 6.217 times higher odds to experiment electronic cigarette than his fellow female (95% CI: 4.407-8.769). Likewise, there is significant relationship between age and electronic cigarette smoke (p=0.05). The odds to be smoker was higher for 17 years old student or more then the younger one (OR: 1.377, 95% CI: 1-1.897). In regards to school determinant, there was significant association between being school location with electronic cigarette smoke (p<0.001). Being student in downtown area is more likely to smoked electronic cigarette (OR: 1,847, 95% CI: 1.358-2.511). Nevertheless, there was not significant association found in class grade and total score of GPA (p>0.05). In terms of family background, there was significant association between father's education (p<0.05), mother's education (p<0.01), and mother's occupation (p<0.05). In other side, no statistically significant different was found between father's occupations, and living arrangement (p>0.05). The odds of being electronic cigarette smoker increased in accordance with education level of father and mother. Those who came from well-educated family are more likely to try electronic cigarette than less educated father (OR: 2.212, 95% CI: 0.986-4.962) and mother (OR: 2.665 95% CI: 1.293-5.492). In addition, the student who had mother as a worker in private sector (OR: 1.561, 95% CI: 1.119-2.177) and public sector (OR: 1.114, 95% CI: 0.65-1.909) tended tends to become electronic cigarette smoker. Ultimately, the student who received daily pocket money more than IDR 20,000 (1 USD= 13,000 IDR) had 1.877 times higher odds (95% CI: 1.347-2.616) for experimenting electronic cigarette.

Table 29. Mother tobacco smoking status by level of education

Mother's Education	**Mother's Tobacco Smoking**	
	No n(%)	**Yes n(%)**
Primary	113 (8.9)	3 (2.6)
Secondary	742 (58.7)	34 (63)
Higher	409 (32.4)	17 (31.5)

Table 29 showed mother tobacco smoking status by level of education. This study found increment of level mother's education tended to increase the proportion of tobacco smoking. Among respondent with mother actively smoke tobacco, about 31.5% were graduated from higher education institution, 63% from secondary school and 2.6% from primary school.

Table 30. Father electronic cigarette Smoking status by level of education

Father's Education	Father's Electronic Cigarette Smoking	
	No n(%)	Yes n(%)
Primary	77 (5.9)	1 (10)
Secondary	712 (54.5)	3 (30)
Higher	518 (39.2)	6 (60)

Table 30 showed father's electronic cigarette smoking status by level of education. The study also revealed electronic cigarette smoking status of father in line with increasing of level of education. Among respondent whose father smoked electronic cigarette, a total 60% were having higher education, 30% of secondary school and 10% of primary school level.

4.10 Association between Social Influence with Shisha and Electronic Cigarette Smoking

Table 31. Association between social influences with shisha smoking

Smoking Status	Shisha Smoker			
	n=271	(%)	Crude OR (CI=95 %)	p value
Father				**0.003**
No	110	(16.7)	1	
Yes	161	(23)	1.506 (1.149-1.975)	
Mother				**0.028**
No	253	(20)	1	
Yes	18	(32.1)	1.889 (1.06-3.366)	

Table 31 (Continued)

Sociodemographic	Shisha Smoker			
	n=271	(%)	Crude OR (CI=95 %)	p value
Brother				**0.001**
No	212	(19)	1	
Yes	59	(29.1)	1.745 (1.245-2.447)	
Sister				0.08
No	261	(20.3)	1	
Yes	10	(33.3)	1.967 (0.91-4.254)	
Close Friend				**<0.001**
No	20	(5.9)	1	
Yes	251	(25.6)	5.45 (3.392-8.755)	
Classmate				**<0.001**
No	24	(9.4)	1	
Yes	247	(23.2)	2.913 (1.869-4.541)	
Teacher				0.628
No	28	(22.2)	1	
Yes	243	(20.4)	0.896 (0.575-1.396)	

The table 31 showed association between social influences with shisha smoking. There was significant association between smoking status of father ($p<0.01$), mother ($p<0.05$), brother ($p<0.01$), close friend ($p<0.001$), classmate ($p<0.001$) and with shisha smoking. Friend played significant contribution to shisha smoking. The student who had close friend tobacco smokers were 5.45 (95% CI: 3.392-8.755) times higher likelihood to be shisha smoker than having no best friend smoke tobacco Despite table 18 found no significant association between sister smoker with being shisha smoker but the odds were higher than having no sister smoked tobacco (OR: 1.967, 95% CI: 0.91-4.254).

Table 32. Association between social influences with electronic cigarette smoking

Smoking Status	Electronic Cigarette Smoker			
	n=193	(%)	Crude OR (CI=95 %)	p value
Father				**<0.001**
No	70	(10.9)	1	
Yes	123	(18.2)	1.811 (1.321-2.484)	
Mother				**0.009**
No	178	(14.1)	1	
Yes	15	(26.8)	2.228 (1.208-4.11)	
Brother				**0.015**
No	152	(13.6)	1	
Yes	41	(20.2)	1603 (1.093-2.352)	
Sister				0.068[+]
No	185	(14.4)	1	
Yes	8	(26.7)	2.168 (0.951-4.943)	
Close Friend				**<0.001**
No	12	(3.6)	1	
Yes	181	(18.5)	6.128 (3.369-11.146)	
Classmate				**0.002**
No	22	(8.6)	1	
Yes	171	(16.1)	2.03 (1.273-3.238)	
Teacher				
No	20	(15.9)	1	0.681
Yes	173	(14.6)	0.9 (0.715-1.673)	

[+]= Fisher Exact Test

Table 32 showed association between social influences with electronic cigarette smoking. There was significant association between father ($p<0.001$), mother, ($p<0.01$), brother ($p<0.05$), close friends ($p<0.001$), and classmate ($p<0.001$) smoking status with electronic cigarette smoking. In addition, sister smoking status were marginally associated with ever use of electronic cigarette ($p=0.068$). The odds of being electronic cigarette smoker were 6.128 (95% CI: 3.369-11.146) times

likely in student who had close friends smoking tobacco compare to none of friend smoking tobacco. Significant association was not also found in sister smoking status and teacher smoking status.

4.11 Association between Cigarette Smoking with Shisha and Electronic Cigarette Smoking

Table 33. Association between cigarette smoking with shisha smoking

Cigarette Smoking Status	Shisha Smoker			
	n=193	(%)	Crude OR (CI=95 %)	p value
Lifetime				**<0.001**
No	58	(7.1)	1	
Yes	213	(42.9)	9.914 (7.194-13.663)	
Past year				**<0.001**
No	114	(11.2)	1	
Yes	139	(53)	8.996 (6.664-12.144)	
Current				**<0.001**
No	167	(15.1)	1	
Yes	104	(48.8)	5.359 (3.911-7.344)	

Table 33 explained association between cigarette smoking with shisha smoking. Statistically significant different was found between lifetime, past year, and current cigarette smoking with shisha and electronic cigarette smoking ($p<0.001$). The strength of association was remarkably high with the odds of being shisha smoking were 9.914 (95% CI: 7.194-13.663) times in lifetime smoker than nonsmoker. Past year cigarette smoker were 8.996 (95% CI: 6.664-12.144) times more likely to become shisha smoker.

Table 34. Association between cigarette smoking to shisha smoking

Cigarette Smoking Status	Shisha Smoker			
	n=193	(%)	Crude OR (CI=95 %)	p value
Lifetime				**<0.001**
No	25	(3)	1	
Yes	168	(33.9)	16.329 (10.523-25.338)	
Past year				**<0.001**
No	61	(6)	1	
Yes	132	(44.6)	12.68 (8.974-17.916)	
Current				**<0.001**
No	99	(9)	1	
Yes	94	44.1)	8.027 (5.712-11.28)	

Table 34 showed association between lifetime cigarette smoking with electronic cigarette use. There were 3% of students who never tried cigarette smoking but already used electronic cigarette. There was significant association between lifetime cigarette used with experimented electronic cigarette ($p<0.001$). The odds of trying electronic cigarette were 16.329 (CI 95%: 10.523-25.338) times more likely in cigarette smoker than nonsmoker. There was significant association between past year cigarette smoking with electronic cigarette smoking ($p<0.001$). Those who smoked cigarette during past year were 12.68 (95% CI: 8.974-17.916) times more likely to smoke electronic cigarette than nonsmoker. Statistically significant different were found between past 30 days cigarette smoker with ever tried electronic cigarette at least one times in life ($p<0.001$). The odds of being electronic cigarette smoker were 8.027 (95%; 5.712-11.28) times greater in current cigarette smoker than nonsmoker.

4.12 Association between Accessibility with Shisha and Electronic Cigarette Smoking

Table 35. Association between accessibility with shisha smoking

Accessibility	Shisha Smoking			
	n=271	(%)	Crude OR (CI=95 %)	p value
Availability				**<0.001**
No	55	(9.4)	1	
Yes	216	(29.5)	4.057 (2.946-5.586)	
Affordability				**<0.001**
No	85	(11.3)	1	
Yes	186	(32.8)	3.825 (2.874-5.091)	
Have Money to Buy				**<0.001**
No	131	(14.9)	1	
Yes	140	(32.1)	2.711 (2.062-3.565)	

Table 35 showed association between accessibility with shisha smoking. There were significant association between availability (p<0.001), affordability (p<0.001), and having enough money to bur with shisha smoking (p<0.001) with ever use of shisha at least one time in life. The odds of being shisha smoking with availability, affordability, and having enough money were 4.057 (95% CI: 2.946-5.586), 3.825 (95% CI: 2.874-5.091), and 2.711 (95% CI: 2.062-3.565) respectively.

Table 36. Association between accessibility with shisha smoking

Accessibility	Electronic Cigarette Smoker			
	n=193	(%)	Crude OR (CI=95 %)	p value
Availability				**<0.001**
No	78	(9.7)	1	
Yes	115	(22.5)	2.704 (1.978-3.695)	

Table 36 Continued

Accessibility	Electronic Cigarette Smoker			
	n=193	**(%)**	**Crude OR (CI=95 %)**	**p value**
Affordability				**<0.001**
No	111	(11.6)	1	
Yes	82	(22.6)	2.219 (1.618-3.043)	
Have Money to Buy				**<0.001**
No	120	11.8	1	
Yes	73	24.6	2.447 (1.767-3.389)	

Table 36 showed association between accessibility with electronic cigarette smoking. Significant association was found between availability (p<0.001), affordability (0<0.001), and have enough money to buy with electronic cigarette smoking (p<0.001). Those who think electronic cigarette available anytime and anywhere were 2.704 (95% CI: 1.978-3.695) times more likelihood to tried electronic cigarette. The odds of being electronic cigarette smoker were also 2.219 (95% CI: 1.618-3.043) times higher for those who think electronic cigarette were affordable. Similarly, student who have enough money to buy were 2.447 (95% CI: 1.767-3.389) times more likely to use electronic cigarette.

4.13 Association between Knowledge with Shisha and Electronic Cigarette Smoking

Table 37. Association between knowledge with shisha smoking

Knowledge	Shisha Smoking			
	n=271	**(%)**	**Crude OR (CI=95 %)**	**p value**
Low	72	(35.5)	1	**<0.001**
Moderate	149	(16.3)	0.355 (0.253-0.497)	
High	50	(24.8)	0.599 (0.389-0.92)	

Table 40 showed association between knowledge with shisha smoking. Significant association was found between levels of knowledge on shisha smoking and shisha smoking (p<0.001). Student who had good knowledge on harmful effect of shisha smoking were less likely to be shisha smoker rather than low knowledge, 0.355 (95% CI: 0.253-0.497) times in moderate knowledge, and 0.599 (95% CI: 0.389-0.92) times in high knowledge respectively

Table 38. Association between knowledge with electronic cigarette smoking

Knowledge	**Shisha Smoking**			
	n=271	**(%)**	**Crude OR (CI=95 %)**	**p value**
Low	72	(35.5)	1	**<0.001**
Moderate	149	(16.3)	0.355 (0.253-0.497)	
High	50	(24.8)	0.599 (0.389-0.92)	

Table 38 indicated association between knowledge with electronic cigarette smoking. There was statistically significant different between levels of knowledge on electronic cigarette smoking with ever tried electronic cigarette (p<0.001). Student with good knowledge on harmful effect of electronic cigarette smoking tended to have fewer odds for being electronic cigarette smoker than low knowledge student. The odds of being electronic cigarette smoker were 0.249 (95% CI: 0.172-0.362) times in moderate knowledge student, 0.489 (0.185-0.435) times in high knowledge student.

4.14 Summary of Association between Independent Variables with Shisha and Electronic Cigarette Smoking

Table 39. Summary of association between all independent variables with shisha and electronic cigarette smoking

Independent Variables	**Shisha**	**Ecig**
	p value	**p value**
Gender	<0.001	<0.001
Age	0.462	0.05

Table 39 Continued

Independent Variables	Shisha	Ecig
	p value	p value
School location	<0.001	<0.001
Daily pocket money	<0.001	<0.001
Father's education	0.002	0.016
Mother's education	0.027	0.008
Mother's occupation	0.852	0.03
Father smoking	0.003	<0.001
Mother smoking	0.028	0.009
Brother smoking	0.001	0.015
Sister smoking	0.08	0.068
Close friend smoking	<0.001	<0.001
Classmate smoking	<0.001	0.002
Availability	<0.001	<0.001
Affordability	<0.001	<0.001
Have money to buy	<0.001	<0.001
Lifetime cigarette smoking	<0.001	<0.001
Past year cigarette smoking	<0.001	<0.001
Current smoking	<0.001	<0.001
Knowledge	<0.001	<0.001

Table 39 explained association between intendents variable with shisha and electronic cigarette smoking. Significant association ($p<0.01$) was found between electronic cigarette, and shisha smoking with gender, school location, daily pocket money. There were statistically significant different was found between father education and mother education with shisha smoking at the p value less than 0.01 and 0.05 respectively. The significant association was also found between father education ($p<0.05$) and mother education ($p<0.01$) with electronic cigarette smoking. In addition, age and mother occupation was not statistically significant different with shisha smoking but significantly associated with electronic cigarette smoking ($p<0.05$). Accessibility, cigarette smoking status, and knowledge

significantly associated to both of shisha and electronic cigarette smoking with p value less than 0.001.

4.14 Shisha and Electronic Cigarette Smoking Predictors

Table 40. Final model multiple logistic regression of shisha smoking

	Shisha smoking		**Ecig smoking**	
	AOR (95% CI)	**p value**	**AOR (95% CI)**	**p value**
Gender				
Female	1		1	
Male	1.454 (1.016-2.082)	**0.041**	3.432 (2.258-5.217)	**<0.001**
School location				
Suburban	1		1	
Downtown	2.012 (1.437-2.816)	**<0.001**	1.535 (1.044-2.257)	**0.029**
Father's education				
Primary	1	**0.008**	**n.s**	
Secondary	0.789 (0.372-1.674)	0.538		
Higher	1.375 (0.643-2.942)	0.412		
Father smoking				
No	1		1	
Yes	1.469 (1.048-2.06)	**0.026**	1.728 (1.173-2.545	**0.006**
Brother smoking				
No	1		**n.s**	
Yes	1.638 (1.056-2.543)	**0.018**		
Close friend smoking				
No	1		1	
Yes	2.547 (1.487-4.362)	**0.001**	2.503 (1.277-4.906)	**0.008**
Lifetime cigarette smoking				
No	1		1	
Yes	4.251 (2.683-6.734)	**<0.001**	4.496 (2.52-8.022)	**<0.001**

Table 40 Continued

	Shisha smoking		Ecig smoking	
	AOR (95% CI)	**p value**	**AOR (95% CI)**	**p value**
Past year cigarette smoking				
No	1		1	
Yes	2.422 (1.58-3.71)	**<0.001**	3.254 (2.038-5.196)	**<0.001**
Availability				
No	1		1	
Yes	2.414 (1.633-3.57)	**<0.001**	2.936 (1.983-4.346)	**<0.001**
Affordability				
No	1			
Yes	2.414 (1.689-3.45)	**<0.001**	**n.s**	
Knowledge				
Low	1	**0.018**	1	**<0.001**
Moderate	0.547 (0.36-0.831)	**0.005**	0.373 (0.233-0.597)	**<0.001**
High	0.657 (0.384-1.122)	0.657	0.284 (0.165-0.49)	**<0.001**

Table 40 showed electronic cigarette and shisha smoking predictors. Binary Logistic Regressions was performed by using Forward Conditional Method in order to create statistical model that can precisely predict the probability of shisha and electronic cigarette smoking. Two variables (daily pocket money and GPA) were excluded from the test because of high missing data cases.

Table 38 showed final model of multiple logistic regression of shisha smoking. The result revealed gender ($p<0.05$), school location ($p<0.001$), father education ($p<0.01$), father smoking status ($p<0.05$), brother smoking status ($p<0.05$), close friend smoking status ($p<0.001$), lifetime cigarette smoking ($p<0.001$), past year cigarette smoking ($p<0.001$), availability ($p<0.001$), affordability ($p<0.001$), and knowledge ($p<0.05$) were significant predictors of shisha smoking. Cigarette smoking status and close friend smoking status was strongest predictor of shisha smoking. Those who ever tried cigarette smoke were four times (AOR: 4.251, 95% CI: 2.683-6.734) more likely to be shisha smoker than non-cigarette smoker. In

addition, having close friend tobacco smoker were 3 times (AOR: 2.547, 95% CI: 1.487-4.362) more likely to smoke shisha. This statistical model can predict 84.8% of shisha smoking among high school students in Jakarta.

For electronic cigarette predictors, gender ($p<0.001$), school location ($p<0.05$), having father smoker ($p<0.01$), close friend smoking status ($p<0.01$), lifetime cigarette smoking ($p<0.001$), past year cigarette smoking ($p<0.001$), availability ($p<0.001$), and knowledge ($p<0.001$) were significant predictor of electronic cigarette smoking. Lifetime cigarette smoking and Gender was the strongest predictor for electronic cigarette smoking. The AOR of being electronic cigarette smoker were four times (AOR: 4.496, 95% CI: 2.52-8.022) greater among lifetime cigarette smoker compare to non-smoker. Moreover, being male students was three times (AOR: 3.432, 955 CI: 2.258-5.217) more likely to become electronic cigarette smoker. This statistical model can predict 88.5% of electronic cigarette smoking among high school students in Jakarta.

CHAPTER V

DISCUSSION

The study main purpose of the research is to describe the prevalence of shisha and electronic cigarette among high school students in Jakarta, Indonesia. The research also examined the association between socio-demographic characteristics, social influence, accessibility, cigarette smoking status, and knowledge to shisha and electronic cigarette smoking. The study design was cross-sectional descriptive. A total of 1,318 students' age 15-19 was taken into account in data analysis. The measurement tool was mostly adopted from WHO Global Youth Tobacco Survey. The data were collected from April to May 2014. The Chi Square Test and Multiple Logistic Regression were performed to analyze the relationship between shisha and electronic cigarette smoking with all independent variables. The study obtained ethical approval from Institute of Research and Community Service, Atma Jaya Catholic University of Indonesia No: 404/III/LPPM-PM. 10. 05/04/2015.

5.1 Prevalence of Shisha and Electronic Cigarette Smoking

The study reported a total of 20.6% Jakarta students had ever tried shisha smoking at least one time in a life, 15.5% smoked within past year, and another 5.2% were considered as current user (past 30 days). The rate is slightly higher than Vietnam's study which found prevalence of young adult (19-24 years old) who smoked shisha in past 30 days were 3% (Morton et al., 2014). Unfortunately, there is no previous study in Indonesia specifically address shisha smoking. Prior survey from GYTS only mentions the prevalence of non-cigarette smoking product in general. The data revealed about 6.5% of adolescent in Indonesia currently use non-cigarette smoking products (WHO Regional Office For South East Asia, 2009).

The study also found a total of 14.6% students ever used electronic cigarette at least one time in life, 12.5% used in past year, and 3.4% categorized as past 30 days user. The finding is considerably high since a previous study in Korea reported only

9.4% of adolescent were classified as lifetime electronic cigarette user (Lee et al., 2014). Moreover, the result was also far greater compare to a latest study from GATS data which revealed the prevalence of current electronic cigarette smoker among Indonesian adult was only 0.3% (Palipudi et al., 2015). The gap was even larger when compared to younger age group of 15-24 years old which reached to 0.2% (Palipudi et al., 2015). However, the finding of this study is still lower than western countries (Goniewicz & Zielinska-Danch, 2012). For instance, a study in Poland revealed the prevalence of adolescence age of 15-19 whoever tried electronic cigarette reached 23.5% (Goniewicz & Zielinska-Danch, 2012).

All the facts above showed that Indonesia is facing multiple burden of tobacco smoking. Absent of comprehensive tobacco control regulation is undoubtedly a root cause of tobacco epidemic (Thabrany, 2012). Tobacco industry is almost freely to sell their deadly product to Indonesian people. They use all channel to create friendly environment for smoking (Thabrany, 2012). Tobacco smoking is becoming internalized as normal habit for Indonesian people (Thabrany, 2012). On the other side, the public education on danger of tobacco smoking remains rare (Bigwanto, 2014). There is no systematic education program to prevent from tobacco use. The existing program is only sporadic and ceremonial event. The activities was also running by civil society organization (Tandilittin & Luetge, 2013).

The struggle to prevent from electronic cigarette and shisha addiction were even harder. Many people don't realize the health effect related to the products. This study found only 22.5% of students coincided that electronic cigarette may have similar or greater health effect than cigarette smoking. For shisha, majority (90%) of student were not sure shisha contains similar or greater carcinogenic than regular cigarette. The finding is also confirmed by previous study reported electronic cigarette and shisha were imaged healthier and more socially acceptable than regular cigarette (Kakodkar & Bansal, 2013; Kinnunen et al., 2014). Moreover, electronic cigarette industries obviously promote their product as healthier alternative to smoke tobacco and even as a cessation aid (Yao, Jiang, Grana, Ling, & Glantz, 2014). Without any immediate measure, these two non-cigarette products can be the most prevalent form of tobacco smoking in the near future.

5.2 Association between Independent Variables with Shisha and Electronic Cigarette Smoking

1. Demographic characteristic

This study reported that gender was significantly associated with both electronic cigarette ($p<0.001$) and shisha smoking ($p<0.05$). Male student was more likely to smoke shisha (AOR: 1.454, 95% CI: 1.016-2.082) and electronic cigarette (AOR: 3.432, 95% CI: 2.258-5.217). Prevalence of shisha and electronic cigarette smoking among male were 30.7%, and 28.4% respectively which is almost double than female. The finding was consistence with some previous paper (Goniewicz & Zielinska-Danch, 2012; Lee et al., 2014). A survey in Poland and South Korea reported being male is a significant factor for electronic cigarette smoking ($p<0.01$) (Goniewicz & Zielinska-Danch, 2012; Lee et al., 2014). For shisha smoking, a survey in Britain and Pakistan found that female were less likely to experiment smoking shisha than male (Grant et al., 2014; Jawaid et al., 2008). Therefore, male gender tends to be shisha and electronic cigarette smoker regardless cultural issue.

School location was a significant predictors in this study ($p<0.01$). Student who admitted in downtown located school were more likely to be a smoker of shisha (AOR: 2.012, 95% CI: 1.437-2.816) and electronic cigarette (AOR: 1.535, 95% CI: 1.044-2.257). The prevalence of shisha and electronic cigarette smoker among downtown and suburban student were 28.4% and 19.3% respectively. In Korea, living in metropolitan city and city were associated with using electronic cigarette (Lee et al., 2014). Likewise, shisha smoking doesn't root in local culture like in Middle East and South Asia. The shisha cafe only flourished surrounding city center area (Suara Merdeka, 2006). Therefore, prevalence of shisha smoking in downtown school was 10% higher suburban.

In terms of family background, shisha and electronic cigarette smoking significantly associated with parent's education ($p<0.05$) and daily pocket money ($p<0.001$) according this study. The respondents with higher pocket money were two times more likely to ever try electronic (OR: 1.877, 95% CI:

1.347-2.616) and shisha smoking (OR: 1.997, 95% CI: 1.49-2.677). Interestingly, student with higher education family were more likely to smoke shisha and electronic cigarette which may relate to smoking status of parent. The proportion of student who have father smoking electronic cigarette were higher among the higher education background compare to secondary and primary education, 60%, 30%, and 10% respectively. Among respondent with mother actively smoke tobacco, about 31.5% were graduated from higher education institution, 63% of secondary school, and 2.6% of primary school. The result was reverse with previous study on cigarette smoking which found student who has parent with lower education tends to become smoker than who have parents with high education level (Bigwanto, 2014). However, the finding was consistent with previous study reported prevalence of electronic cigarette smoking were higher among well educated people than lower level (Morton et al., 2014; Palipudi et al., 2015). In Indonesia, the prevalence of female smoker were gradually increased pin recent year (Tobacco Control Support Center, 2013). Tobacco industry tried to drive tobacco smoking as gender equality issue thus well-educated woman in urban setting are the most attracted to try cigarette smoking as symbol of freedom and female have equal opportunity to experience what most of male carried out (Thabrany, 2012).

Parent's education, occupation and daily pocket money seems related to socioeconomic status. In Indonesia, the price of shisha and electronic cigarette is obviously more expensive than cigarette smoking. The study also found student reported they need to spend IDR 35,300 to smoke shisha and 50,000-10,000 for electronic cigarette which is extensively higher compare to regular cigarette price. In addition, given shisha and electronic cigarette was somewhat considered as new culture in Indonesia hence those with high education level would be more aware and attracted to try (Suara Merdeka, 2006).

2. Social influence

The relationship between smoking behaviors with parent's smoking history is widely available in many articles (Kakodkar & Bansal, 2013; Kinnunen et al.,

2014; Lee et al., 2014). In this study, father ($p<0.001$), mother ($p<0.01$) brother ($p<0.05$), close friend ($p<0.001$), and classmate ($p<0.01$) significantly associated for both electronic cigarette and shisha smoking. Over one-third (22.6%) shisha smoker have father who used tobacco whilst among electronic cigarette reported to about 20.4%. Friends also have significant influence to decision of smoking shisha and electronic cigarette. A total of 74.4% students revealed have close friend who smoke tobacco, and 81.8% have classmate actively use tobacco. Shisha and electronic cigarette are perceived with safer image of smoking. This perception will obviously more encourage people to tried smoking shisha and electronic cigarette. Furthermore, when an activity is carried by many people anytime and anywhere, it may be considered as normal habitual.

3. Knowledge on health effect of shisha and electronic cigarette smoking.

In this study, knowledge on harmful effect of electronic cigarette and shisha smoking significantly associated with shisha and electronic cigarette smoking ($p<0.001$). However, understanding on potential health effect of electronic cigarette and shisha was in alarming situation. Approximately 10.5% of student firmly stated that electronic cigarette is no less addictive than conventional cigarette. Only quarter (26%) students believe that Shisha isn't safer than cigarette. This result was similar with reported by previous study which revealed shisha and electronic cigarette have harmless image than cigarette smoker and have more appeal to young people (Berg et al., 2015; Kinnunen et al., 2014).

4. Accessibility of shisha and electronic cigarette smoking

Access to get shisha and electronic cigarette played important role in this research. Availability ($p<0.001$) and affordability ($p<0.001$) were significantly associated in both shisha and electronic cigarette. The finding was in accordance with similar survey in Indonesia about cigarette smoking (Bigwanto, 2014; Sulistiowati & Martini, 2004). WHO recommended the access of any tobacco products should be restricted in order to denormalize tobacco use (World Health Organization, 2013). There are some measure can be done to limit access of tobacco products such as increasing the price, banning the advertisement, and

probation selling to minor (Marynak et al., 2014). In fact, there is lack of concrete action from the government control the use of shisha and electronic cigarette.

5. Cigarette smoking status

The result of full model in multivariable analysis showed that cigarette smoking ($p<0.001$) were the strong predictors for being shisha and electronic cigarette smoking. This result is in line with all previous study on electronic cigarette and shisha smoking (Lee et al., 2014; Primack et al., 2008). For instance, a study in Korea found the student who experienced smoking cigarette had significantly associated to electronic cigarette use ($P< 0.01$) with odds ratio 11.2 (CI 95%: 3.9-32.3) (Lee et al., 2014).

In this study, there were 7.1% of electronic shisha smokers, and 3% of electronic cigarette smokers never tried cigarette smoking before. The concern of public health advocate was electronic cigarette and shisha could be the gateway for smoking cigarette. In addition, electronic cigarette and shisha smoking will undermine the existing effective measure of tobacco control such as smoke free area (International Union Againsts Tuberculosis and Lung Diseases, 2013). Some electronic cigarette industry claimed that it can be used inside the building (Yao et al., 2014) where the cigarette smoking prohibited. Another problem is shisha and electronic cigarette may lure the former cigarette user to completely stop smoking (World Health Organization, 2014). Therefore, shisha and electronic cigarette were potentially renormalizing tobacco smoking

5.3 Conclusion

Of the 1,318 student participated in the study, 20.6% reported ever smoked at least one in lifetime, 15.5% in past year, and 5.3% in past 30 days. Electronic cigarette smoker were derived 14.6% of lifetime smoker, 12.5% of past year smoker, and 3.4% of current smoker. Ultimately, a total of 10.5% students ever used both shisha electronic cigarettes at least one time in a life, 7.6% smoked both in past year, and 1.1% in past 30 days.

In regard to demographic factors gender ($p<0.001$), school location ($p<0.001$), father's education ($p<0.01$), mother's education ($p<0.05$), and daily pocket money ($p<0.001$) were significantly associated with shisha smoking. Moreover, There was statistically significant different gender ($p<0.001$), age ($p<0.05$), school location ($p<0.001$), father's education ($0<0.05$), mother's education ($p<0.01$), mother's occupation ($p<0.05$), and daily pocket money ($p<0.001$) with experimented electronic cigarette smoking.

Smoking history of father ($p<0.01$), mother ($p<0.05$), brother ($p<0.01$), close friend ($p<0.001$), and classmate ($p<0.001$) had significant association with shisha smoking. For electronic cigarette smoking, significant association was found in smoking status of father ($p<0.001$), mother ($p<0.01$), brother ($p<0.05$), close friend ($p<0.001$), classmate ($p<0.01$).

In terms of access, shisha and electronic cigarette had significantly statistical different with availability ($p<0.001$), affordability ($p<0.001$), and having enough money ($p<0.001$). The study also found majority (more than 85%) student didn't have sufficient information on potential health risk posed by shisha and electronic cigarette smoking. However, the level of knowledge found statistically significant relationship with electronic cigarette ($p<0.001$) and shisha use ($p<0.001$).

Cigarette smoking status had the strongest association with both electronic and shisha use. Lifetime, past year and current smoker significantly associated with shisha and electronic cigarette ($p<0.001$).

Multivariate analysis result revealed gender ($p<0.05$), school location ($p<0.001$), father's education ($p<0.01$), father smoking ($p<0.05$), brother smoking ($p<0.05$), close friend smoking ($p<0.001$), lifetime cigarette smoking ($p<0.001$), past year cigarette smoking ($p<0.001$), availability ($p<0.001$), affordability ($p<0.001$), and knowledge ($0<0.05$) were strong predictors for shisha smoking. For electronic cigarette, the strong predictors were gender ($p<0.001$), school location ($p<0.05$), smoking status of father ($p<0.01$) and close friend ($p<0.01$), lifetime cigarette smoking ($p<0.001$), past year cigarette smoking ($p<0.001$), availability ($p<0.001$), and knowledge ($p<0.001$). Furthermore, lifetime smoker had 4 times

higher likelihood to be electronic cigarette smoker (AOR: 4.251 95% CI: 2.683-6.734) and electronic cigarette (AOR: 4.496, 95% CI: 2.52-8.022) than nonsmoker.

5.4 Limitation

The study subjected some limitations which may have implication to outcome. First, It only included general type school run by government which can't represent the situation in private and vocational school. The result is possibly underestimate the prevalence. However, the sample size is far greater to represent one province. Secondly, there was not statistically significant different in age to any shisha and electronic cigarette as reported in previous study because the study didn't include 3rd year students. Data collection was conducted on April-May 2012 that nearly before national examination day. In this case, the researcher didn't have plenty of time to catch the academic schedule.

The research has some other limitation including:

1. The study may hinder generalizability to national population because the data were only collected in one province and conducted in school instead of community.
2. Smoking is sensitive issue in school setting. Many students would hesitate to tell the real smoking status to outsider. Thus, the self-administered report seemed the best way to obtain the data. However, it may pose lots of missing data.
3. In addition, the main objectives of study to find out prevalence and factors associated with shisha and electronic cigarette smoking. Nevertheless, there is no chance to confirm smoking status by laboratory test because need more cost and time.
4. The study is focusing in urban and capital city. Therefore, the finding may not represent the situation in the rural area
5. There is no standard tools to assess level of knowledge related to shisha and electronic cigarette use thus the finding wouldn't comprehensively describe relationship between knowledge with shisha and electronic cigarette

smoking behavior. However, the questionnaire was already proof by professional.

5.5 Recommendations

1. Recommendation for School

The school should create health education program with emphasize on tobacco and other psychoactive substance addiction through compulsory subject in class. The school health unit provides counseling and stop smoking therapy. Since the teacher found as significant contributor to smoking behavior, the school principal must issue the provision on sanction for the teacher and academics staff who smoked in school.

2. Recommendation for Government

The study reported that accessibility had significant association with electronic cigarette and shisha smoking. Almost one third students perceived that shisha and electronic cigarette were easily obtained and affordable. This situation reflects that shisha and smoking prevention policy by voluntary rule were ineffective. There must be specific regulation to restrict the minor groups including children smoke any form of tobacco use. Furthermore, the existing tobacco control measure such as smoke free area, total ban advertising, installation of pictorial health warning, surcharge high tax for shisha and electronic cigarette can also be applied in shisha and electronic cigarette. This course of action was already proven highly effective to combat cigarette smoking epidemic. Further, family background was significant determinant of shisha and electronic cigarette smoking. Thus, the local authority should develop program to strengthen family resilient which need a capacity building for family to develop their skill to perform health protective behavior.

3. Recommendation for Further Research

The study can be baseline in the field of non-cigarette smoking product. The future research can be more focus on user instead of all population which

emphasis on the pattern of use, and laboratory test to check what kind of chemical compound found in current shisha and electronic cigarette smoker.

There is no standard tools to measure levels of knowledge toward health shisha and electronic cigarette smoking. Future research should try out develop the standardized questionnaire which can be applied in any setting.

The existing evidence of shisha and electronic cigarette didn’t provide sufficient information about potential health risk posed by shisha and electronic cigarette both for smoker and secondhand smoker. After more than five years emerge as new trend of tobacco use, shisha and electronic cigarette should have effect to the community. Therefore, the health risk research on electronic cigarette and shisha is urgently needed before shisha and electronic cigarette become a new tobacco epidemic.

REFERENCES

Achadi, A., Soerojo, W., & Barber, S. (2005). The relevance and prospects of advancing tobacco control in Indonesia. *Health Policy, 72*(3), 333-349. doi: 10.1016/j.healthpol.2004.09.009

Aditama, T. Y. (2014). *Preventing and Managing Substance Use Disorder Including Harmful Use of Tobacco, Alcohol, and Drugs in Indonesia*. Paper presented at the International NGO Summit on The Prevention of Drugs, Alcohol, and Tobacco Abuse, University of Muhammadiyah Yogyakarta.

Ahern, N. R., & Mechling, B. (2014). E-Cigarette; A Rising Trend Among Youth. *Journal of Psychosocial Nursing, 52*(6), 27-31.

American Lung Association. (2007a). An Emerging Deadly Trend: Waterpipe Tobacco Use *Tobacco Policy Trend Alert*: American Lung Association.

American Lung Association. (2007b). Hookah Smoking: A Growing Threat to Public Health: American Lung Association.

Bandura, A., & McClleland, D. (1977). *Social learning theory*. New York: General Learning Press.

Barber, S., & Ahsan, A. (2009). The tobacco excise system in Indonesia: hindering effective tobacco control for health. *J Public Health Policy, 30*(2), 208-225. doi: 10.1057/jphp.2009.12

Berg, C. J., Stratton, E., Schauer, G. L., Lewis, M., Wang, Y., Windle, M., & Kegler, M. (2015). Perceived harm, addictiveness, and social acceptability of tobacco products and marijuana among young adults: marijuana, hookah, and electronic cigarettes win. *Subst Use Misuse, 50*(1), 79-89. doi: 10.3109/10826084.2014.958857

Bigwanto, M. (2014). *Factors Related to Cigarette Smoking Among High School Students in Banten Province, Indonesia.* (Master), Mahidol University, Bangkok.

Blachman-Braun, R., Lira Del Mazo-Rodriguez, R., Lopez-Samano, G., & Buendia-Roldan, I. (2014). Hookah, is it really harmless? *Respiratory Medicine, 108*(5), 661-667. doi: 10.1016/j.rmed.2014.01.013

Bloom, D. E., Cafiero, E. T., Jané-Llopis, E., Abrahams-Gesse, S., Bloom, L. R., Fathima, S., . . . Weiss, J. (2011). *The Global Economic Burden of Noncommunicable Diseases*. Paper presented at the World Economic Forum, Geneva.

Brown, J., West, R., Beard, E., Michie, S., Shahab, L., & McNeill, A. (2014). Prevalence and characteristics of e-cigarette users in Great Britain: Findings from a general population survey of smokers. *Addict Behav, 39*(6), 1120-1125. doi: 10.1016/j.addbeh.2014.03.009

Callahan-Lyon, P. (2014). Electronic cigarettes: human health effects. *Tob Control, 23*, 36-40.

Camenga, D. R., Delmerico, J., Kong, G., Cavallo, D., Hyland, A., Cummings, K. M., & Krishnan-Sarin, S. (2014). Trends in use of electronic nicotine delivery systems by adolescents. *Addict Behav, 39*(1), 338-340. doi: 10.1016/j.addbeh.2013.09.014

Caponnetto, P., Campagna, D., Papale, G., Russo, C., & Polosa, R. (2012). The emerging phenomenon of electronic cigarettes. *Expert Rev Respir Med, 6*(1), 63-74. doi: 10.1586/ers.11.92

Czoli, C. D., Hammond, D., Reid, J. L., Cole, A. G., & Leatherdale, S. T. (2015). Use of Conventional and Alternative Tobacco and Nicotine Products Among a Sample of Canadian Youth. *J Adolesc Health, 57*(1), 123-125. doi: 10.1016/j.jadohealth.2015.03.006

Dockrell, M., Morrison, R., Bauld, L., & McNeill, A. (2013). E-cigarettes: prevalence and attitudes in Great Britain. *Nicotine Tob Res, 15*(10), 1737-1744. doi: 10.1093/ntr/ntt057

Doubeni, C. A., Li, W., Fouayzi, H., & DiFranza, J. R. (2009). Perceived accessibility of cigarettes among youth: a prospective cohort study. *Am J Prev Med, 36*(3), 239-242. doi: 10.1016/j.amepre.2008.11.006

Dugas, E. N., O'Loughlin, E. K., Low, N. C., Wellman, R. J., & O'Loughlin, J. L. (2014). Sustained waterpipe use among young adults. *Nicotine Tob Res, 16*(6), 709-716. doi: 10.1093/ntr/ntt215

Eriksen, M., Mackay, J., & Ross, H. (2012). *Tobacco Atlas Forth Edition*. New York: World Lung Foundation.

Euromonitor International. (2012). E-cigarettes: a US$2 billion global industry – who should be worried? . Retrieved October 17, 2014, from http://blog.euromonitor.com/2012/11/e-cigarettes-a-us2-billion-global-industry-who-should-be-worried.html

Gatra. (2014). Rokok Elektronik Sehat? Jangan Mimpi deh Retrieved October 19, 2014, from http://www.gatra.com/lifehealth/sehat-1/50545-rokok-elektronik-sehat-jangan-mimpi-deh.html

Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annu Rev Public Health, 31*, 399-418. doi: 10.1146/annurev.publhealth.012809.103604

Glanz, K., Rimer, B. K., & Visawanath, K. (2005). *Health Behavior and Health Education: Theory Research and Practice* (Vol. 4). San Francisco, CA: Jossey-Bass.

Global Youth Tobacco Survey Collaborative Group. (2012). Global Youth Tobacco Survey (GYTS): Core Questionnaire with Optional Questions, Version 1.0. July 2012. Retrieved from http://www.who.int/tobacco/surveillance/gyts/en/ website:

Goniewicz, M. L., & Zielinska-Danch, W. (2012). Electronic Cigarette Use Among Teenagers and Young Adults in Poland. *Pediatrics, 130*(4), 879-885.

Grant, A., Morrison, R., & Dockrell, M. J. (2014). Prevalence of waterpipe (Shisha, Narghille, Hookah) use among adults in Great Britain and factors associated with waterpipe use: data from cross-sectional Online Surveys in 2012 and 2013. *Nicotine Tob Res, 16*(7), 931-938. doi: 10.1093/ntr/ntu015

Harian Terbit. (2014). Shisha, Gaya Hidup Menemani Waktu Santai. Retrieved July 12, 2014, from http://www.harianterbit.com/read/2014/07/15/5130/24/24/Shisha-Gaya-Hidup-Menemani-Waktu-Santai

Henningfield, J. E., & Zaatari, G. S. (2010). Electronic nicotine delivery systems: emerging science foundation for policy. *Tob Control, 19*(2), 89-90. doi: 10.1136/tc.2009.035279

International Union Againsts Tuberculosis and Lung Diseases. (2013). Position Statement on Electroic Cigarettes (ECs) or Electronic Nicotine Delivery System (ENDS) [Press release]

Jawaid, A., Zafar, A. M., Rehman, T. U., Nazir, M. R., Ghafoor, Z. A., Afzal, O., & Khan, J. A. (2008). Knowledge, attitudes and practice of university students regarding waterpipe smoking in Pakistan. *Int J Tuberc Lung Dis, 12*(9), 1077-1084.

Kakodkar, P. V., & Bansal, S. S. (2013). Hookah Smoking: Characteristics, Behavior and Perceptions of Youth Smokers in Pune, India. *Asian Pacific Journal of Cancer Prevention, 14*(7), 4319-4323. doi: 10.7314/apjcp.2013.14.7.4319

Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia. (2008). Indonesian Basic Health Research 2007. Jakarta: National Institute for Health Research and Development.

Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia. (2011). Indonesian Basic Health Research 2010. Jakarta: National Institute for Health Research and Development.

Kementerian Kesehatan (Kemenkes - MOH) of Republic of Indonesia. (2013). Indonesian Basic Health Research 2013. Jakarta: National Institute for Health Research and Development.

Kementerian Kesehatan (Kemenkes - MOH) of Republik of Indonesia. (2013). Indonesian Basic Health Research 2013. Jakarta: Kemenkes.

Kinnunen, J. M., Ollila, H., El-Amin, S. E., Pere, L. A., Lindfors, P. L., & Rimpela, A. H. (2014). Awareness and determinants of electronic cigarette use among Finnish adolescents in 2013: a population-based study. *Tob Control*. doi: 10.1136/tobaccocontrol-2013-051512

Kossen, S. (2012). *Current Burden and Economic Costs of Major Tobacco Attributed Diseases in Indonesia*. Paper presented at the The 15th World Conference on Tobacco or Health (WCTOH), Singapore.

Lee, S., Grana, R. A., & Glantz, S. A. (2014). Electronic cigarette use among Korean adolescents: a cross-sectional study of market penetration, dual use, and relationship to quit attempts and former smoking. *J Adolesc Health, 54*(6), 684-690. doi: 10.1016/j.jadohealth.2013.11.003

Lemeshow, S., Jr, D. W. K., Klar, J., & Lwanga, S. K. (1990). *Adequacy of Sample Size in Health Studies*. West Susex: John Wile & Sons Co Ltd.

Lian, T. Y., & Dorotheo, U. (2013). *The ASEAN Tobacco Atlas* (B. Rittipakhde, M. A. Kolandai, F. Kin, D. C. Villarreiz, M. J. Alampay, J. L. Reyes, S. Ratanachena, & W. Jirathanapiwat Eds. First ed.). Bangkok: South East Asia Tobacco Control Alliance (SEATCA).

M, H., M, A., & Talbot, P. (2013). Health-related effects reported by electronic cigarette users in online forums. *J Med Internet Res, 15*(4), e59.

Markus, S., Mohamad, K., Sidipratomo, P., Mia Hanafiah, Soerojo, W., Pohan, H. S., . . . R, M. A. M. (2013). *Peta Jalan Pengendalian Produk Tembakau Indonesia*. Surakarta: University of Muhammadiyah Surakarta Press.

Marynak, K., Holmes, C. B., King, B. A., Promoff, G., Bunnell, R., & McAfee, T. (2014). State laws prohibiting sales to minors and indoor use of electronic nicotine delivery systems--United States, November 2014. *MMWR Morb Mortal Wkly Rep, 63*(49), 1145-1150.

Maziak, W. (2008). The waterpipe: time for action. *Addiction, 103*(11), 1763-1767. doi: 10.1111/j.1360-0443.2008.02327.x

Maziak, W. (2013). The waterpipe: An emerging global risk for cancer. *Cancer Epidemiology, 37*(1), 1-4. doi: 10.1016/j.canep.2012.10.013

Maziak, W., Eissenberg, T., Rastam, S., Hammal, F., Asfar, T., Bachir, M. E., . . . Ward, K. D. (2004). Beliefs and attitudes related to narghile (waterpipe) smoking among university students in Syria. *Ann Epidemiol, 14*(9), 646-654. doi: 10.1016/j.annepidem.2003.11.003

Maziak, W., Taleb, Z. B., Bahelah, R., Islam, F., Jaber, R., Auf, R., & Salloum, R. G. (2014). The global epidemiology of waterpipe smoking. *Tob Control, 0*, 1-10. doi: doi:10.1136/tobaccocontrol-2014-051903

Maziak, W., Ward, K. D., Soweid, R. A. A., & Eissenberg, T. (2004). Tobacco smoking using a waterpipe: a re-emerging strain in a global epidemic. *Tob Control, 13*(4), 327-333. doi: 10.1136/tc.2004.008169

McCall, C. (2014). Tobacco advertising still rife in southeast Asia. *Lancet, 384*(9951), 1335-1336.

McCauley, L., Markin, C., & Hosmer, D. (2012). An unexpected consequence of electronic cigarette use. *Chest, 141*(4), 1110-1113. doi: 10.1378/chest.11-1334

Ministry of Education and Culture. Data Referensi Pendidikan. Retrieved October 25, 2014, from http://referensi.data.kemdikbud.go.id

Morton, J., Song, Y., Fouad, H., El Awa, F., El Naga, R. A., Zhao, L., . . . Grp, G. C. (2014). Cross-country comparison of waterpipe use: nationally representative data from 13 low and middle-income countries from the Global Adult Tobacco Survey (GATS). *Tob Control, 23*(5), 419-427. doi: 10.1136/tobaccocontrol-2012-050841

Mulla, M. A., S, A. H., J, A. L., S, A. N., S, A. A. R., A, A., . . . S, A. (2008). Prevalence of tobacco use among students aged 13-15 years in Health Ministers' Council/Gulf Cooperation Council Member States, 2001-2004. *J Sch Health, 6*(78), 337-343. doi: 10.1111/j.1746-1561.2008.00311.x

National Cancer Institute. (2005). *Theory at a Glance*: US Department of Health and Human Service.

National Institute of Health Research and Development. (2012). Global Adult Tobacco Survey: Indonesia Report 2011 (WHO Regional Office For South East Asia, Trans.). In S. Kossen (Ed.). Jakarta: Ministry of Health Republic of Indonesia.

O'Connor, R. J. (2012). Non-cigarette tobacco products: What have we learned and where are we headed? *Tob Control, 21*(2), 181-190. doi: doi:10.1136/tobaccocontrol-2011-050281

Palipudi, K. M., Mbulo, L., Morton, J., Mbulo, L., Bunnell, R., Blutcher-Nelson, G., . . . Asma, S. (2015). Awareness and Current Use of Electronic Cigarettes in Indonesia, Malaysia, Qatar, and Greece: Findings From 2011-2013 Global Adult Tobacco Surveys. *Nicotine Tob Res*. doi: 10.1093/ntr/ntv081

Pepper, J. K., & Eissenberg, T. (2014). Waterpipes and Electronic Cigarettes: Increasing Prevalence and Expanding Science. *Chem. Res. Toxicol, 27*, 1336−1343.

Primack, B. A., Sidani, J., Agarwal, A. A., Shadel, W. G., Donny, E. C., & Eissenberg, T. E. (2008). Prevalence of and associations with waterpipe tobacco smoking among US university students. *Annals of Behavioral Medicine, 36*(1), 81-86. doi: 10.1007/s12160-008-9047-6

Statistics Indonesia (Badan Pusat Statistik-BPS). (1995). National Socio Economic Survey 1995. Jakarta.

Statistics Indonesia (Badan Pusat Statistik-BPS). (2001). National Socio Economic Survey 2001. Jakarta.

Statistics Indonesia (Badan Pusat Statistik-BPS). (2004). National Socio Economic Survey 2004. Jakarta.

Steinberg, L. (2007). Risk Taking in Adolescence: New Perspectives From Brain and Behavioral Science. *SAGE Journals, 16*(2), 55-59. doi: DOI: 10.1111/j.1467-8721.2007.00475.x

Stepanov, I., Biener, L., Yershova, K., Nyman, A. L., Bliss, R., Parascandola, M., & Hatsukami, D. K. (2014). Monitoring Tobacco-Specific N-Nitrosamines and Nicotine in Novel Smokeless Tobacco Products: Findings From Round II of the New Product Watch. *Nicotine & Tobacco Research, 16*(8), 1070-1078. doi: 10.1093/ntr/ntu026

Suara Merdeka. (2006). Shisha, Gaya Hidup Baru Orang Jakarta. Retrieved October 17, 2014, from http://www.suaramerdeka.com/harian/0601/23/bud01.htm

Sulistiowati, M., & Martini, S. (2004). The determinants of smoking behavior among teenagers in East Java Province, Indonesia. *Health, Nutrition and Population (HNP) Economics of Tobacco Control Discussion Paper, 5*.

Tandilittin, H., & Luetge, C. (2013). Civil Society and Tobacco Control in Indonesia: The Last Resort. *The Open Ethics Journal, 7*, 11-18.

Tauras, J. A., Huang, J., & Chaloupka, F. J. (2013). Differential impact of tobacco control policies on youth sub-populations. *Int J Environ Res Public Health, 10*(9), 4306-4322. doi: 10.3390/ijerph10094306

Thabrany, H. (2012). *Indonesia; The Heaven for Cigarette Companies and The Hell for The People* (H. Thabrany & P. Sarnantio Eds.). Depok: Center for Anti Smoking, Faculty of Public Health, University of Indonesia.

Tim Liputan6 SCTV. Nikmatnya Menghisap Shisha. Retrieved October 17, 2014, from http://news.liputan6.com/read/146875/nikmatnya-mengisap-shisha

Tobacco Control Support Center. (2012). *Indonesia Tobacco Fact*. Jakarta: Tobacco Control Support Center.

Tobacco Control Support Center. (2013). *Indonesia Tobacco Atlas* (R. Fauzi, K. Mohamad, A. Antojo, K. Soewarso, & Zakiyah Eds.). Jakarta: TCSC IAKMI.

Tobacco Control Support Center. (2014). *Declaration of The 1st Indonesian Conference on Tobacco or Health 2014*. Paper presented at the The 1st Indonesian Conference on Tobacco or Health 2014, Jakarta.

Unger, J. B., Yan, L., Shakib, S., Rohrbach, L. A., Chen, X., Qian, G., . . . Johnson, C. A. (2002). Peer influences and access to cigarettes as correlates of adolescent smoking: a cross-cultural comparison of Wuhan, China, and California. *Prev Med, 34*(4), 476-484. doi: 10.1006/pmed.2001.0996

US Center for Disease Control and Prevention. (2013). Notes from the field: electronic cigarette use among middle and high school students - United States, 2011-2012. *MMWR Morb Mortal Wkly Rep, 62*(35), 729-730.

US Department of Health and Human Services. (2012). *Preventing Tobacco Use Among Youth and Young : A Report of the Surgeon General*. Atlanta, GA US: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

WHO Regional Office For South East Asia. (2009). Indonesia (Ages 13-15) Global Youth Tobacco Survey Fact Sheet (T. F. Initiative, Trans.). New Delhi.

World Health Organization - Tobacco Free Initiative. (2014). Electronic cigarettes (e-cigarettes) or electronic nicotine delivery systems [Press release]. Retrieved from http://www.who.int/tobacco/communications/statements/eletronic_cigarettes/en/

World Health Organization. (2005). *Preventing Chronic Diseases: A Vital Investment. WHO Global Report*. Geneva: WHO Press.

World Health Organization. (2008). *WHO Report on the Global Tobacco Control, 2008: MPOWER Package*. Geneva: WHO Press.

World Health Organization. (2013). WHO Report on The Global Tobacco Epidemic, 2013: Enforcing bans on tobacco advertising, promotion and sponsorship (T. F. Initiative, Trans.). Geneva.

World Health Organization. (2014). *Electronic Nicotine Delivery Systems*. Paper presented at the Conference of the Parties to the WHO Framework Convention on Tobacco Control, Moskow. http://apps.who.int/gb/fctc/PDF/cop6/FCTC_COP6_10-en.pdf

Yao, T., Jiang, N., Grana, R., Ling, P. M., & Glantz, S. A. (2014). A content analysis of electronic cigarette manufacturer websites in China. *Tob Control*. doi: 10.1136/tobaccocontrol-2014-051840

APPENDIX I

QUESTIONAIRE

Instruction

- Please, **do not write your name on this questionnaire**. Hence, nobody will be able to identify who has completed this particular form.
- Please read each questions carefully before answering it.
- Choose the answer that best describes what you believe and feel to be correct.
- Choose only **one** answer for each question except multiple answers as indicate at the end of question.
- If you have to change your answer, don't worry; just erase it completely, without leaving marks.
- This is not a test; therefore **there are no 'right' or 'wrong' answers**.

The first few questions ask about background information about your self

1. How old are you?.....Years old
2. What is your gender?
   ☐ Male ☐ Female
3. In what grade are you now?
   ☐ 1st year ☐ 2nd year ☐ 3rd year
4. What is your grade point average in the last semester? Score……
5. During school semester, what type of your accommodation you live in?
   ☐ Owned house with parents ☐ Living in relative's house
   ☐ Rental house/apartment ☐ Others……
6. With whom do you live? (You can select more than one)
   ☐ Father ☐ Sister ☐ Other……
   ☐ Mother ☐ Brother ☐ None
7. What is the highest education that obtained by your father's?
   ☐ No education ☐ Secondary school ☐ College
   ☐ Primary school ☐ High school ☐ Others……....

8. What is the highest education that obtained by your Mother's?

☐ No education ☐ Secondary school ☐ College

☐ Primary school ☐ High school ☐ Others……....

9. What is your father's occupation?

☐ Unemployed ☐ Army or police ☐ Labor

☐ Civil Servant ☐ Private sector ☐ Others……..

☐ Entrepreneur ☐ Retired

10. What is your mother's occupation?

☐ Unemployed ☐ Army or police ☐ Labor

☐ Civil Servant ☐ Private sector ☐ Others…….

☐ Entrepreneur ☐ Retired

11. How much money do you get from your parents daily? Rp……

The next questions ask about smoking status of people surrounding your life

Please see the picture bellow before you answer the next following questions

Electronic Cigarette Shisha

12. Does your father smoke tobacco?

☐ No ☐ Yes

If Yes, What type? (you can select more than one)

☐ Cigarette ☐ Shisha ☐ Electronic cigarette ☐ Other……..

13. Does your mother smoke tobacco?

☐ No ☐ Yes

If Yes, What type? (you can select more than one)

☐ Cigarette ☐ Shisha ☐ Electronic cigarette ☐ Other……

14. Does your brother(s) smoke tobacco?
☐ No ☐ Yes

If Yes, What type? (you can select more than one)
☐ Cigarette ☐ Shisha ☐ Electronic cigarette ☐ Other…….

15. Does your sister(s) smoke tobacco?
☐ No ☐ Yes

If Yes, What type? (you can select more than one)
☐ Cigarette ☐ Shisha ☐ Electronic cigarette ☐ Other……

16. Does your best friend smoke tobacco?
☐ No ☐ Yes

If Yes, What type? (you can select more than one)
☐ Cigarette ☐ Shisha ☐ Electronic cigarette ☐ Other…….

17. Does your classmate smoke tobacco?
☐ No ☐ Yes

If Yes, What type? (you can select more than one)
☐ Cigarette ☐ Shisha ☐ Electronic cigarette ☐ Other……

18. About how many teacher in your school smoke tobacco?
☐ No ☐ Yes

If Yes, What type? (you can select more than one)
☐ Cigarette ☐ Shisha ☐ Electronic cigarette ☐ Other……

The next questions ask about your use of cigarette

19. Have you ever tried or experimented cigarette smoking, even one or two puffs?
☐ No ☐ Yes

20. How old were you when you first tried smoking cigarette?.....Years old

21. What is the main reason of experimenting cigarette smoking?
☐ Imitating public figure ☐ Imitating parents ☐ Looks tasty
☐ Persuaded by friends ☐ Feeling mature ☐ Others…….
☐ Release Stress ☐ Curios

22. During the past 1 year, did you smoke cigarette?
☐ No ☐ Yes

23. During the past 30 days, did you smoke cigarette?
☐ No ☐ Yes

If yes, on how many days did you smoke cigarette?.....Day(s)

24. How many sticks cigarette did you usually smoke in per day?.....Stick(s)

The next questions ask about your use of shisha smoking

25. Have you ever tried or experimented shisha smoking, even one or two puffs?
☐ No **(Go to number 35)** Yes

26. How old were you when you first tried smoking shisha?.....Years old

27. What is the main reason of experimenting shisha smoking at the first time?
☐ Imitating someone ☐ Release Stress ☐ Looks tasty ☐ Curios
☐ Persuaded by friend ☐ Feeling mature ☐ Others……..

28. During the past 1 year, did you smoke shisha?
☐ No ☐ Yes

29. During the past 30 days, did you smoke shisha?
☐ No ☐ Yes

If yes, how many days did you smoke shisha?.....Day(s)

30. How many shisha smoking sessions do you usually participate in a day? ……..session(s)

31. Do you usually share the same shisha with others?
☐ No ☐ Yes

32. Do you think you will smoke a shisha at any time during next 12 months?
☐ No ☐ Yes

The next questions ask about getting shisha

33. Where do you usually smoke shisha?
☐ I didn't ever smoked shisha ☐ At a bar or club ☐ At home
☐ At a Shisha Café/restaurant ☐ At a friend's house ☐ Other…..

34. Did anyone refuse to serve you shisha because of your age?
☐ I didn't ever try to get shisha served to me
☐ No, my age did not keep me from being served shisha
☐ Yes, someone refused to serve me shisha because of my age

35. Do you think you can get shisha easily anywhere you are and whenever you want them? (even you don't smoke)
☐ No ☐ Yes

36. If you ever smoked shisha, How much money do you usually spend for smoking shisha per month? Rp……

37. Do you think the price of shisha smoking is affordable? (even you don't smoke)
☐ No ☐ Yes

38. Do you think you always have enough money to buy shisha smoking? (even you don't smoke)
☐ No ☐ Yes

The next questions ask about your knowledge of shisha smoking

		True	**Don't know**	**False**
39.	Shisha is harmless compare to regular cigarette.	☐	☐	☐
40.	Shisha is less irritating to the respiratory tract than cigarettes.	☐	☐	☐
41.	Shisha contains less nicotine than cigarettes.	☐	☐	☐
42.	Fruit flavor in shisha detoxifies the smoke.	☐	☐	☐
43.	Shisha contains fewer carcinogens than cigarette.	☐	☐	☐
44.	Less frequency of use limits the side effect of shisha.	☐	☐	☐

The next questions ask about use of electronic cigarette

45. Have you ever tried or experimented electronic cigarette smoking, even one or two puffs?
☐ No ☐ Yes

46. How old were you when you first tried smoking electronic cigarette?.....Years Old

47. What is the main reason of experimenting electronic cigarette smoking at the first time?
☐ Imitating public figure ☐ Imitating parents ☐ Tasty
☐ Persuaded by friends ☐ Feeling mature ☐ Others…….
☐ Release Stress ☐ Curiosity

48. During the past 1 year, did you smoke electronic cigarette?
☐ No ☐ Yes

49. During the past 30 days, did you smoke electronic cigarette?
☐ No ☐ Yes

If yes, how many days did you smoke electronic cigarette?.....Days

50. How much electronic cigarette liquid do you usually smoke in a day?.....mg

51. Do you think you will smoke an electronic cigarette at any time during next 12 months?
☐ No ☐ Yes

The next questions ask about getting shisha

52. Where do you usually buy electronic cigarette? (select only one)
☐ I didn't ever buy electronic cigarette ☐ From a kiosk ☐ Other…..

☐ Form a shopping mall ☐ From a restaurant/cafe

☐ From someone else ☐ From internet

53. Did anyone refuse to sell you electronic cigarette because of your age?
☐ I didn't ever try to buy electronic cigarette

☐ No, my age did not keep me from buying electronic cigarette

☐ Yes, someone refused to sell me electronic cigarette because of my age

54. Do you think you can get electronic cigarette easily anywhere you are and whenever you want them? (even you don't smoke)
☐ No ☐ Yes

55. If you ever smoked electronic cigarette, How much money do you usually spend for smoking electronic cigarette per month? Rp……..

56. Do you think the price of electronic cigarette smoking is affordable? (even you don't smoke)
☐ No ☐ Yes

57. Do you think you always have enough money to buy electronic cigarette smoking? (even you don't smoke)
☐ No ☐ Yes

The next questions ask about your knowledge of electronic cigarette smoking

		True	Don't know	False
58.	Electronic cigarette make easier for you to cut down on the number of cigarette you smoke.	☐	☐	☐
59.	Electronic cigarette might help you quit smoking cigarette.	☐	☐	☐
60.	Electronic cigarette do not contain any of the toxic chemicals that can be found in combustible cigarettes.	☐	☐	☐
61.	Electronic cigarette is less harmful than regular cigarette.	☐	☐	☐
62.	Electronic cigarette is less addictive than regular cigarette.	☐	☐	☐

Thank You for Participating

APEENDIX 2

QUESTIONAIRE (BAHASA VERSION)

Instruksi

- Mohon untuk tidak menuliskan nama pada kuesioner ini.
- Mohon baca setiap pertanyaan secara cermat sebelum menjawabnya.
- Pilihlah jawaban yang anda **yakini paling benar**.
- Jika anda ingin mengubah jawaban, jangan khawatir; cukup hapus jawaban sebelumnya tanpa meninggalkan bekas.
- Ini bukan sebuah tes; sehingga **tidak ada jawaban yang benar dan salah**.

Beberapa pertanyaan pembuka ini ingin menggali latar belakang diri anda

1. Berapa usia anda sekarang? ……..tahun
2. Apa jenis kelamin?
   ☐ laki-laki ☐ Perempuan
3. Kelas berapa sekarang?
   ☐ X ☐ XI ☐ XII
4. Berapa nilai rata-rata pada semester terakhir? Nilai……
5. Selama semester berlangsung, dimana biasa anda tinggal?
   ☐ Rumah berasama orang tua ☐ Di rumah kerabat
   ☐ Sewa Rumah/Kost ☐ Lainnya……
6. Dengan siapa anda tinggal? (bisa memilih lebih dari satu)
   ☐ Ayah ☐ Kakak/adik laki-laki ☐ Tidak ada
   ☐ Ibu ☐ Kakak/adik perempuan ☐ Lainnya……
7. Apa pendidikan terakhir ayah?
   ☐ Tidak tamat sekolah ☐ SMP ☐ Perguruan Tinggi
   ☐ SD ☐ SLTA/SMA
8. Apa pendidikan terakhir ibu?
   ☐ Tidak tamat sekolah ☐ SMP ☐ Perguruan Tinggi
   ☐ SD ☐ SLTA/SMA

9. Apa pekerjaan ayah?

☐ Tidak bekerja ☐ Tentara atau polisi Buruh

☐ Pegawai negeri ☐ Karyawan swasta lainnya……..

☐ Wiraswasta ☐ Pensiunan

10. Apa pekerjaan ibu?

☐ Tidak bekerja ☐ Tentara atau polisi ☐ Buruh

☐ Pegawai negeri ☐ Karyawan swasta ☐ lainnya……..

☐ Wiraswasta ☐ Pensiunan

11. Berapa uang jajan anda setiap bulan? Rp. ……

Pertanyaan berikut ini ingin menggali informasi tentang kebiasan merokok orang terdekat

Mohon lihat gambar di bawah berikut ini sebelum menjawab pertanyaan

Rokok elektrik Shisha

12. Apakah ayah merokok?

☐ Tidak ☐ Ya

Jika ya, apa jenisnya? (anda bisa memilih lebih dari satu)

☐ Rokok ☐ Shisha ☐ Rokok elektrik ☐ Lainnya ……..

13. Apakah ibu merokok?

☐ Tidak ☐ Ya

Jika ya, apa jenisnya? (anda bisa memilih lebih dari satu)

☐ Rokok ☐ Shisha ☐ Rokok elektrik ☐ Lainnya ……..

14. Apakah kakak/adik laki-laki merokok?

☐ Tidak ☐ Ya

Jika ya, apa jenisnya? (anda bisa memilih lebih dari satu)
☐ Rokok ☐ Shisha ☐ Rokok elektrik ☐ Lainnya ……..

15. Apakah adik/kakak perempuan merokok?
☐ Tidak ☐ Ya
Jika ya, apa jenisnya? (anda bisa memilih lebih dari satu)
☐ Rokok ☐ Shisha ☐ Rokok elektrik ☐ Lainnya …….

16. Apakah teman terdekat merokok?
☐ Tidak ☐ Ya

Jika ya, apa jenisnya? (anda bisa memilih lebih dari satu)
☐ Rokok ☐ Shisha ☐ Rokok elektrik ☐ Lainnya ……..

17. Berapa banyak teman sekelas yang merokok?
☐ Tidak ☐ Ya

Jika ya, apa jenisnya? (anda bisa memilih lebih dari satu)
☐ Rokok ☐ Shisha ☐ Rokok elektrik ☐ Lainnya ……..

18. Berapa banyak guru di sekolah yang merokok?
☐ Tidak ☐ Ya

Jika ya, apa jenisnya? (anda bisa memilih lebih dari satu)
☐ Rokok ☐ Shisha Rokok elektrik ☐ Lainnya ……..

Pertanyaan berikutnya menggali informasi tentang kebiasaan merokok

19. Pernahkah anda mencoba merokok meskipun hanya satu hisap?
☐ Tidak ☐ Ya

20. Pada usia berapa anda pertama kali mulai merokok? ……tahun

21. Apa alasan utama mencoba merokok? (pilih hanya satu)
☐ Mengikuti artis ☐ Mengikuti orang tua ☐ Rasanya nikmat

☐ Dibujuk teman ☐ Merasa dewasa ☐ Lainnya…….

☐ Melepas stress ☐ Penasaran

22. Selama satu tahun terakhir, apakah merokok?
☐ Tidak ☐ Ya

23. Selama 30 hari terakhir, apakah merokok?
☐ Tidak ☐ Ya.

Jika ya, berapa hari anda merokok?.....Hari

24. Berapa batang biasanya merokok dalam sehari?.....Batang

Pertanyaan berikutnya menggali informasi tentang kebiasaan merokok shisha

25. Apakah pernah mencoba shisha meskipun hanya satu hisap?
☐ Tidak ☐ Ya

26. Pada usia berapa pertama kali mencoba shisha?.....tahun

27. Apa alasan utama mencoba shisha? (pilih hanya satu jawan)
☐ Mengikuti orang lain ☐ Rasanya nikmat ☐ lainnya…….
☐ Dibujuk teman ☐ Merasa dewasa
☐ Melepas stress ☐ Penasaran

28. Selama satu tahun terakhir, apakah anda merokok shisha?
☐ Tidak ☐ Ya

29. Selama 30 hari terakhir, apakah anda merokok shisha?
☐ Tidak ☐ Ya
Jika ya, berapa hari merokok shisha dalam satu 30 hari terakhir?.....hari

30. Berapa sesi biasanya anda merokok shisha dalam sehari?.....Sesi

31. Apakah anda biasa membagi shisha bersama orang lain?
☐ Tidak ☐ Ya

32. Apakah anda berencana merokok shisha dalam 12 bulan kedepan?
☐ Tidak ☐ Ya

Pertanyaan berikutnya menggali informasi tentang akses mendapatkan shisha

33. Dimana anda biasanya merokok shihsa? (hanya pilih satu jawaban)
☐ Tidak pernah merokok shisha ☐ Bar or club ☐ Rumah teman
☐ Shisha café/restaurant ☐ Rumah ☐ Lainnya……

34. Pernahkan ada orang yang menolak melayani anda untuk membeli shisha karena masih di bawah umur?
☐ Tidak pernah merokok shisha ☐ Tidak ☐ Ya

35. Apakah anda pikir sangat mudah untuk memperoleh shisha dimanapun dan kapanpun menginginkannya? (meskipun tidak pernah merokok shisha)
☐ Tidak ☐ Ya

36. Jika anda pernah merokok shisha, berapa uang yang anda habiskan untuk membeli shisha setiap bulan? Rp…….

37. Menurut pendapat anda, apakah harga shisha terjangkau? (meskipun tidak pernah merokok shisha)
☐ Tidak ☐ Ya

38. Apakah anda merasa selalu memiliki cukup uang untuk membeli shisha? (meskipun tidak pernah merokok shisha)
☐ Tidak ☐ Ya

Pertanyaan berikut tentang pengetahuan anda terhadap penggunaan shisha

		Benar	Tidak Tahu	Salah
39.	Shisha lebih aman dibandingkan rokok biasa.	☐	☐	☐
40.	Shisha lebih sedikit mengiritasi tenggorokan dibandingkan rokok biasa.	☐	☐	☐
41.	Shisha mengandung lebih sedikit nikotin dibandingkan rokok biasa.	☐	☐	☐
42.	Rasa buah dalam shisha bisa mendetoxifiasi (menghilangkan) bahaya yang timbul dari asap.	☐	☐	☐
43.	Shisha mengandung lebih sedikit karsinogenik (pemicu kanker) dibandingkan rokok biasa	☐	☐	☐
44.	Lebih sedikit frekuensi penggunaan shisha akan membatasi efek samping yang ditimbulkan..	☐	☐	☐

Pertanyaan berikut tentang penggunaan rokok elektrik

45. Pernahkah anda mencoba rokok elektrik meskipun hanya satu hisap?
☐ Tidak ☐ Ya

46. Pada usia berapa pertama kali mencoba rokok elektrik? .....tahun

47. Apa alasan utama mencoba rokok elektrik?
☐ Mengikuti orang lain ☐ Rasanya nikmat ☐ lainnya…….
☐ Dibujuk teman ☐ Merasa dewasa
☐ Melepas stress ☐ Penasaran

48. Dalam satu tahun terakhir, apakah anda pernah menggunakan rokok elektrik?
☐ Tidak ☐ Ya

49. Dalam 30 hari terakhir, apakah anda pernah menggunakan rokok elektrik?
☐ Tidak ☐ Ya

Jika ya, berapa hari anda menggunakan rokok elektrik dalam 30 hari terakhir?.....hari

50. Berapa banyak e liquid yang anda hisap dalam satu hari?.....miligrams

51. Apakah anda berencana untuk menggunakan rokok elektrik dalam 12 bulan ke depan?
☐ Tidak ☐ Ya

Pertanyaan berikut tentang bagaimana anda mendapatkan rokok elektrik

52. Dimana anda biasanya membeli rokok elektrik? (hanya pilih satu jawaban)
☐ Tidak pernah membeli rokok elektrik ☐ Kios
☐ Pusat perbelanjaan/mall ☐ Restaurant/cafe
☐ Seorang teman/kerabat/kolega ☐ Internet
☐ Lainnya……..

53. Pernahkan ada orang yang menolak melayani anda untuk membeli rokok elektrik karena masih di bawah umur?
☐ Saya tidak pernah merokok shisha ☐ Tidak ☐ Ya

54. Apakah anda pikir sangat mudah untuk memperoleh rokok elektrik dimanapun dan kapanpun menginginkannya? (meskipun anda tidak pernah menggunakan rokok elektrik)
☐ Tidak ☐ Ya

55. Jika anda pernah menggunakan rokok elektrik, berapa uang yang anda habiskan untuk membeli rokok elektrik setiap bulan? Rp…….

56. Menurut pendapat anda, apakah harga srokok elektrik terjangkau? (meskipun anda tidak pernah menggunakan rokok elektrik)
☐ Tidak ☐ Ya

57. Apakah anda merasa selalu memiliki cukup uang untuk membeli rokok elektrik? (meskipun anda tidak pernah menggunakan rokok elektrik)
☐ Tidak ☐ Ya

Pertanyaan berikut ini tentang pengetahuan anda terhadap penggunaan rokok elektrik

		Benar	Tidak Tahu	Salah
58.	Rokok elektrik dapat membantu untuk mengurangi merokok	☐	☐	☐
59.	Rokok elektrik dapat membantu untuk berhenti merokok	☐	☐	☐
60.	Rokok elektrik tidak mengandung bahan kimia toksik yang terdapat di rokok biasa	☐	☐	☐
61.	Rokok elektrik lebih aman dibandingkan rokok biasa.	☐	☐	☐
62.	Rokok elektrik kurang tingkat adiktif dibandingkan rokok biasa	☐	☐	☐

Terimakasih Telah Berpartisipasi

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