

Nicotine Dependence Level On Adult Smokers In West Java Indonesia

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Abstract: Introduction: Smoking is an adverse behavior for one person and others. Although there are various negative effects of smoking, it does not affect the smokers to quit smoking, thus they had a nicotine dependence. The purpose of this research was to identify the sociodemographic characteristics and smoking history with nicotine dependence, and to identify the level of nicotine dependence on smokers.

Patients and Methods: This research was quantitative descriptive research. The population in this study was 338 smokers. This research used total sampling method and it obtained a sample of 159 adult respondents. Data were collected using the Fagerström Nicotine Dependence (FTND).

Results: The result of this research showed that, even though respondents in low levels of nicotine dependence (42,1%), most respondents were in a moderate level of nicotine dependence (39%), high of nicotine dependence (13,8%), and very high of nicotine dependence (5,1%). In addition, the majority of nicotine dependence tended to occur in respondents aged 18-40 years (49,7%), male (84,3%), final year of high school (49,1%), working as an entrepreneur (65,4%), and had an income of less than Rp2.893.074,72 (68,6%). In respondents' smoking history, nicotine dependence was more likely to occur in respondents who started smoking at the age of 13-17 years (50,3%) with smoking for 1-10 years (30,2%), and smoking clove cigarettes (52,8%).

Conclusions and Recommendations: The conclusion of this study that most respondents were in low levels of nicotine dependence and some respondents were in moderate, high, and very high levels of nicotine dependence, and there was a tendency between income and nicotine dependence.

Keywords: Adult; Nicotine dependence; Socioeconomic status

1. INTRODUCTION

Smoking is one of the major causes of death worldwide, and the prevalence of this problem is getting more serious. There are more than one billion smokers worldwide, consisting of 942 million men and 175 million women aged ≥ 15 years old. The smoking prevalence in ASEAN countries are spread 46.16% in Indonesia, 16.62% in the Philippines, 14.11% in Vietnam, 8.73% in Myanmar, 7.74% in Thailand, 2.90% in Malaysia, 2.07% in Cambodia, 1.23% in Laos, 0.39% in Singapore, and 0.04% in Brunei.¹

Smokers who smoke more cigarettes per day are prone to consume more toxins from cigarettes. Those toxins can cause various negative health effects, such as early development of wrinkles and age spots, darkened lips, yellow and damaged teeth, sagging breasts and skin, as well as premature baldness. Smoking could harm many organs within a human's body and cause various health issues, such as Chronic Obstructive Pulmonary Disease (COPD), cardiovascular disease, dental problems, eye disease, and reproductive health.² Those health issues are caused by the fact that cigarettes made of tobacco contain 4000 types of chemical compounds, 400 of which are labeled as dangerous, and 43 of which could promote cancer (carcinogens) and harm overall health. Nicotine, carbon monoxide (CO), and tar are some of the thousands of ingredients found in cigarettes.³

When a person stops smoking, within the first 20 minutes, there are positive improvements to their blood pressure, pulse, and peripheral blood flow. Within 12 hours, the nicotine consumed is almost completely metabolized and the blood's carbon monoxide level returns to normal. After 1-2 days, nicotine starts to be fully eliminated from the body, smell and taste senses improve, and the cardiovascular system performs better. In 2-6 weeks, cilia function in the respiratory system and lungs improve, shortness of breath and coughing problems also start to lighten. After a year, the risk of coronary heart disease decreases by half. In five years, stroke risk decreases to the same level as non-smokers. After ten years, lung cancer risk also halve.³

One of the programs initiated by the government that covers smoking issues is Clean and Healthy Lifestyle (PHBS). There are five implementation areas in PHBS, one being the household. PHBS in households has ten indicators that could help measure whether PHBS has been successfully implemented in the household. One of the indicators is no smoking inside the house. This is a very important indicator because active smokers could also bring negative health effects on passive smokers. Quitting smoking or not smoking inside the house could help prevent various health risks for the rest of the family.⁴

The major obstacle faced by smokers is the amount of effort they have to take to quit smoking. There are a few factors that could affect the likelihood of quitting smoking, e.g. smoking frequency, willingness to quit, nicotine replacement therapy, previous smoking stoppage experience, personal health history, and nicotine dependence.⁵⁻⁷

Rosita, Suswardany, and Abidin et al., (2012) stated that the success rate of stopping smoking is influenced by smoking frequency and will of quitting. Meanwhile, Su et al. (2012) noted that according to a study conducted to 495 respondents, nicotine replacement therapy and previous smoking cessation experience are the main factors. Marques-Vidal et al., (2011), through his study to 1234 respondents, explains that the main factors affecting smoking cessation success rate are personal health history and nicotine dependence level.

The difficulties faced by smokers in quitting smoking are mainly caused by addictive substances found in cigarettes, namely nicotine. Nicotine could trigger addiction in one's body, which results in constant cigarette cravings. This condition is also referred to as nicotine dependence. The percentage of nicotine dependence in various countries and various areas in Indonesia vary from one another. In some areas within Indonesia, the nicotine dependence level is considered low: Pekanbaru (78.8%), Kediri (78.8%), Makassar (52.7%), and Jakarta (32.3%). Meanwhile, Switzerland (51.4%) and Bali (63.7%) are examples of areas with medium nicotine dependence level. Italy (48.6%) and Malaysia (41%) are some countries with a high level of nicotine dependence.^{5,7-13} This dependence is influenced by work as a sociodemographic factor. Age, sex, and education level are proven to have no impact on nicotine dependence.¹³

It takes 15 seconds for nicotine to reach the brain and ± 2 hours to lose consciousness. Higher smoking intensity equals higher opioid levels entering the body. When an addicted smoker suddenly cuts off their nicotine intake, they will be experiencing at least four symptoms,

including insomnia, depression, anxiety, irritability, concentration problem, and lower heart rate within the first 24 hours.¹⁴

Further, the smoker typically also experiences heavy discomfort, both mentally and physically. Psychologically, the smoker will constantly feel uncomfortable. Even though most cigarette packs already put up smoking warnings, they do not seem effective in warning smokers.¹⁵ This condition experienced by addicted smokers is called nicotine withdrawal syndrome. It is one of the main obstacles faced by smokers in quitting smoking.¹⁶ According to the problem background explained, the thesis statement is “Nicotine Dependence Level on Adult Smokers in Sumedang Regency, West Java Province”.

2. PATIENTS AND METHODS

The research design that will be used in this research is quantitative descriptive. It is used to describe and observe sociodemographic characteristics and smoking history on the smoker’s nicotine dependence level. The population in this study is 338 adult citizens aged ≥ 18 years old, sample is 159 adult smokers. The instrument used is a standard instrument for nicotine dependence level measurement, Fagerström Test Nicotine Dependence (FTND), with 6 question items. Courvoisier and Etter (2010) note that the FTND validity test resulted in a total score of 0.72 and 0.70 total score for reliability test. They compared the research to former research by Pomerleau et al. (1993) that resulted in 0.78 total score of FTND reliability test, and Lim et al. (2016) who conducted validity test with Construct Validity and reliability test with Alpha Cronbach, resulting in 0.699 and 0.61 total scores.

The next step is collecting interview data through a door-to-door approach to the citizens. The data collected is then tested and analyzed using data processing software.

3. RESULTS

Sociodemographic characteristics in the respondents are shown in Table 1. According to Table 1, all respondents are adults (aged ≥ 18 years old) with the majority of them (79 respondents or 49.7%) in 18-40 years old age range. Most respondents are males (134 respondents or 84.3%). The majority of the respondents are high school graduates (78 respondents or 49.1%). Based on the occupation, most respondents are entrepreneurs (104 respondents or 65.4%), followed by others (31 respondents or 19.5%). Entrepreneurs are respondents who run their own businesses, such as owning a stall. Most respondents (68.6%) earn less than Rp2.893.074,7 (West Java Provinces’s Regional Minimum Wage in 2019) monthly.

Table 1: Distribution of Respondents’ Sociodemographic Characteristics (n = 159)

Sociodemographic Characteristic	Frequency	Percentage
Age		
18-40 years	79	49,7
41-60 years	66	41,5
> 61 years	14	8,8
Sex		
Female	25	15,7
Male	134	84,3
Religion		
Muslim	158	99,4

Christiani	1	0,6
Latest Education		
Elementery School	34	21,4
Junior High School	34	21,4
Senior High School	78	49,1
Associate Degree	7	4,4
Bachelor Degree	6	3,8
Occupation		
Civil Servant	3	1,9
Private Employee	21	13,2
Entrepreneurs	104	65,4
Others	31	19,5
Income (monthly)		
< Rp2.893.074,72 (\$193,836)	(< 109 50)	68,6 31,4
≥ Rp2.893.074,72 (\$193,836)	(≥	

According to Table 2 about smoking history frequency distribution on respondents (n=159), most respondents started smoking at around 13-17 (80 respondents or 50.3%), followed by 1-10 years old (48 respondents or 30.2%). The most common type of cigarettes is clove cigarettes (*kretek*) (84 respondents or 52.8%)

Table 2: Distribution of Respondents' Smoking History (n = 159)

Smoking History	Frequency	Percentage
Smoking Onset		
6-12 years	5	3,1
13-17 years	80	50,3
18-40 years	71	44,7
41-60 years	3	1,9
Smoking Duration		
1-10 years	48	30,2
11-20 years	33	20,8
21-30 years	32	20,1
31-40 years	28	17,6
41-50 years	16	10,1
51-60 years	1	0,6
61-70 years	1	0,6
Type of Cigarettes		
White Cigarettes	75	47,2
Clove Cigarettes	84	52,8

According to table 3 shows about nicotine dependence level frequency distribution on respondents (n=159), most respondents fall into moderate and high category levels of Nicotine Dependence. Meanwhile, the Nicotine Dependence observed according to sociodemographic characteristics are as follows.

Table 3: Distribution of Respondents' Nicotine Dependence (n = 159)

Level of Nicotine Dependence	Frequency	Percentage
Low	67	42,1
Moderate	62	39,0
High	22	13,8
Very High	8	5,1

According to table 4 show that sociodemographic characteristics and smoking history on respondents nicotine dependence level (n=159), it is concluded that as people age, their nicotine dependence tends to decrease. However, according to the statistics study result, there is no tendency between age and nicotine dependence $p=0,750$ ($p > 0,05$).

The result from a study conducted on nicotine dependence showed that nicotine dependence is mostly present in respondents working as entrepreneurs, with 25.1% low dependence level, 26.4% moderate, 8.8% high, and 3.1% very high. Unemployed respondents such as housewives, labor workers, and retired teachers fall on the second place with 10.7% low dependence level, 6.3% moderate, 3.8% high, and 0.6% very high. According to the statistics study result, there is no tendency between cigarette type and nicotine dependence $p=848$ ($p > 0,05$).

Table 4: Sociodemographic Characteristics and Smoking History on Respondents' Nicotine Dependence Level (n = 159)

Sociodemographic Characteristics and Smoking History	Nicotine Dependence								Asymp. Sig. (2 sided)	
	Low		Moderate		High		Very High			
	f	%	f	%	f	%	f	%		
Age										
18-40 years	34	21,4	31	19,5	10	6,3	4	2,5	0,750	
41-60 years	28	17,6	26	16,4	8	5,1	4	2,5		
> 61 years	5	3,1	5	3,1	4	2,5	0	0		
Sex										
Female	10	6,3	10	6,3	4	2,5	1	0,6	0,977	
Male	57	35,9	52	32,7	18	11,3	7	4,4		
Religion										
Muslim	67	42,2	62	39,0	22	13,8	7	4,4	0,000	
Christiani	0	0	0	0	0	0	1	0,6		
Latest Education										
Elementary School	11	7,0	16	10,1	7	4,4	0	0	0,229	
Junior High School	13	8,2	12	7,5	5	3,1	4	2,5		
Senior High School	36	22,6	29	18,2	10	6,3	3	2,0		
Associate Degree	5	3,1	1	0,6	0	0	1	0,6		
Bachelor Degree	2	1,3	4	2,5	0	0	0	0		
Occupation										
Civil Servant	2	1,3	1	0,6	0	0	0	0	0,869	
Private Employee	8	5,0	9	5,7	2	1,3	2	1,3		
Entrepreneurs	40	25,1	42	26,4	14	8,8	5	3,1		
Others	17	10,7	10	6,3	6	3,8	1	0,6		
Income (monthly)										
< Rp2.893.074,72 (<	44	27,7	44	27,7	18	11,3	3	2,0	0,122	

\$193,836) ≥ Rp2.893.074,72 (≥ \$193,836)	23	14,3	18	11,3	4	2,5	5	3,1	
Smoking Onset									
6-12 years	0	0	2	1,3	2	1,3	1	0,6	0,127
13-17 years	32	20,1	28	17,6	15	9,4	5	3,1	
18-40 years	34	21,4	30	18,9	5	3,1	2	1,3	
41-60 years	1	0,6	2	1,3	0	0	0	0	
Smoking Duration									
1-10 years	23	14,3	17	10,5	5	3,1	3	2,0	0,231
11-20 years	14	8,8	15	9,3	4	2,5	0	0	
21-30 years	14	8,8	13	8,2	3	2,0	2	1,3	
31-40 years	12	7,5	10	6,3	3	2,0	3	2,0	
41-50 years	3	2,0	6	3,8	7	4,4	0	0	
51-60 years	0	0	1	0,6	0	0	0	0	
61-70 years	1	0,6	0	0	0	0	0	0	
Type of Cigarettes									
White Cigarettes	31	19,5	29	18,2	10	6,3	5	3,1	0,848
Clove Cigarettes	36	22,6	33	20,8	12	7,5	3	2,0	

4. DISCUSSION

The result of this study showed a higher dependence level compared to the study done by Su et al. (2012) in Malaysia which showed that most respondents fall into the low nicotine dependence category (35%). Moreover, Akaputra and Prasanty (2018) did a study in a university in Jakarta, resulting in the majority of the respondents having low nicotine dependence level (32.3%). However, a survey done by Marques-vidal et al. (2011) in Switzerland showed that most respondents have moderate nicotine dependence level (51%). A survey conducted by Artana and Rai (2010) in Penglipuran Village, Bali, also showed a similar result with most respondents falling into moderate nicotine dependence level category (73.7%).

Another study showed that most respondents (42.1%) have low nicotine dependence levels. Respondents in this category are those who smoke ≤ 10 sticks/day with an interval of ≤ 60 minutes after waking up in the morning (Heatherton, et al., 1991). When a respondent with low nicotine dependence level stops smoking, they will be experiencing what is called the nicotine withdrawal symptoms, such as feeling of anger, worry, urge to smoke, depression, difficulties in concentrating, frustration, hunger, and anxiety. However, the symptoms appearing on respondents with low nicotine dependence level are still manageable, making it easier for them to quit smoking.¹⁷ Some respondents (39%) have moderate nicotine dependence levels. The respondents in this category are those who smoke 11-21 cigarettes per day with an interval of 31-60 minutes after waking up in the morning.¹⁸ When stop smoking, they will be experiencing some nicotine withdrawal symptoms. Though manageable, the symptoms show up more often compared to respondents with low nicotine dependence level.¹⁷

Some other respondents (13.8%) suffer from high nicotine dependence levels. Respondents in this category are those who smoke 21-30

cigarettes per day with an interval of 6-30 minutes after waking up in the morning.¹⁸ When they stop smoking, they will be experiencing more serious nicotine withdrawal symptoms in a higher frequency compared to respondents with moderate nicotine dependence level. People

with high nicotine dependence level usually cannot manage the symptoms and they tend to go back to smoking.¹⁷

The rest of the respondents (5%) suffer from very high nicotine dependence level. The respondents in this category are those who smoke > 30 sticks/day with an interval of 5 minutes after waking up in the morning.¹⁸ When respondents in this category stops smoking, they will be experiencing severe nicotine withdrawal symptoms in high frequency. They usually lose control and cannot stop smoking.¹⁷

Even though most respondents fall into low nicotine dependence level category, the number of total respondents in the moderate, high, and very high category is concerning. This nicotine dependence needs some serious attention. The higher the nicotine dependence level is, the more it affects one's overall health. Seeing the fact that smoking is one of the main causes of non-communicable diseases with more than 60% cases of death, such as cardiovascular disease, diabetes mellitus, cancer, and chronic obstructive pulmonary disease,¹⁹ some special efforts and strategy are needed to suppress this smoking behavior. As for now, health professionals have already done some efforts in overcoming this smoking issue, such as door-to-door surveys through a healthy family program, health education on the negative health effects of smoking, and counseling service for people who want to quit smoking.

One of the indicators in this healthy family program is the data collection of non-smoking families. The program in West Java is run by local public health center (Puskesmas). Through this program, they are collecting data from families to know the number of smokers and non-smokers within the village.

According to the data collected by a client who visited the local public health center, there was hardly any effort to promote non-smoking behavior and counseling for smokers. This could be caused by the citizens' mindset that smoking habit is not harmful, and this is why it is hard to decrease the number of smoking prevalence.

In this study, nicotine dependence is mostly present on respondents with a monthly income of less than Rp1.500.000,00, and the level gets higher on respondents with more than Rp3.500.000,00 monthly income. This shows that there is a correlation between monthly income and nicotine dependence. It could also be influenced by psychological factors, personality, and stress level.^{11,20,21} The result showed that people with lower monthly income tend to have higher nicotine dependence levels.²² However, another study showed that instead, people with higher incomes tend to have higher nicotine dependence levels. This is most probably caused by their ability to afford more cigarettes.²³

Nicotine dependence is mostly present on respondents who started smoking at the age of 18-40 years old, and it gets higher on respondents who started smoking at 13-17. A survey by Donny et al. (2007) also showed that American smokers started smoking actively at 17-51 years old. Therefore, we can conclude that there is no correlation between the starting age of smoking and nicotine dependence level. However, according to Hymowitz (1997) in his study, respondents who started smoking at the age of 14 years old tend to have higher nicotine dependence level and higher smoking relapse rates after joining a smoking cessation program. Kandel et al. (2007) and Rahayuwati & Castillo (2020) stated that most smokers started at the age of 12-18 years old, and only one third develop into active smokers. Those who become active smokers tend to have higher nicotine dependence levels and tend to fail smoking cessation programs.

Nicotine dependence is mostly present in respondents who have 1-10 years of smoking history, and the dependence level increases on respondents with 1-10, 31-40, and 41-50 years of smoking history. This study shows that there is no correlation between smoking history and nicotine dependence. According to Artana and Rai (2010) in their study, people who

have a longer smoking history tend to have more difficulties in quitting smoking because they have higher nicotine dependence level.

Most respondents with nicotine dependence smoke kretek cigarettes, and a small number of respondents smoke white cigarettes. The result showed that there is no correlation between cigarette types and nicotine dependence level. According to Wahyuni (2012), one stick of white cigarette contains 0.8-1.83mg nicotine, and one stick of kretek cigarette contains 5.07-5.31mg nicotine. Kretek cigarettes contain almost 5 times more nicotine compared to white cigarettes.²⁴ This could be the reason why respondents who smoke kretek cigarettes tend to have higher nicotine dependence level compared to those who smoke white cigarettes.

5. CONCLUSIONS

From this research, we can conclude that most respondents fall into moderate nicotine dependence level category (39%), followed by high (13.8%) and very high (5.1%). The majority of respondents with nicotine dependence are aged between 18-40 years old (49.7%), males (84.3%), high school graduates (49.1%), and working as entrepreneurs (65.4%) with monthly income of less than Regional Salary Minimum (47.2%). According to respondents' smoking history, most respondents with nicotine dependence started smoking at the age of between 18-40 years old (44.7%) with a smoking history of 1-10 years (30.2%) and smoke kretek type of cigarettes (52.8%).

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