

Smoking and socio-demographic risk factors of cardiovascular disease among middle-aged and elderly Indonesian men

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Abstrak

Latar belakang: Di Indonesia kebiasaan merokok di antara laki-laki usia setengah baya dan baya relatif tinggi. Tujuan penulisan ini menggambarkan faktor risiko dominan terhadap penyakit jantung pada laki-laki 45 tahun ke atas di Indonesia.

Metode: Data diambil dari data Riskesdas 2007. Pertanyaan-pertanyaan tentang status merokok, sosio-demografi, dan riwayat penyakit jantung ditanyakan dan dikumpulkan oleh tenaga pewawancara yang sudah dilatih dengan baik.

Hasil: Hasil survey jumlah sampel yang dianalisis adalah 92688 jenis kelamin laki-laki dengan umur 45 tahun ke atas. Perokok aktif dan semakin bertambahnya usia lebih berisiko terkena penyakit jantung. Sedangkan orang dengan belanja rumah tangga rendah mempunyai risiko yang lebih sedikit terkena penyakit jantung. Jika dibandingkan yang bukan perokok, yang merokok antara 1-20 dan 21 batang per hari atau lebih masing-masing memiliki 15% dan 34% risiko terkena penyakit jantung [risiko relatif (RRa) = 1.15; 95% interval kepercayaan (CI) = 1.09-1.20]. Dibandingkan umur 45-54 tahun, yang berumur 55-64, 65-74, dan 75-97 tahun masing-masing memiliki 17%, 38%, dan 83% terkena penyakit jantung (RRa = 1,17 ; 95% CI = 1,10–1,24; RRa = 1,38; 95% CI = 1,29–1,47; RRa = 1,83; 95% CI = 1,74-1,92). Bagi orang dengan belanja rumah tangga dengan pengeluaran rendah memiliki 7% lebih sedikit terkena penyakit jantung (RRa = 0,93; 95% CI = 0,89–0,96)

Kesimpulan: Umur lebih tua, belanja rumah tangga rendah, dan lebih banyak jumlah batang yang dihisap mempertinggi risiko penyakit jantung. Sebagai tindakan pencegahannya dapat dilakukan antara lain dengan mengurangi jumlah batang rokok yang dikonsumsi per hari. (*Health Science Indones 2010; 1: 20 - 25*)

Kata kunci: penyakit kardiovaskular, rokok, umur tua, Indonesia

Abstract

Background: Smoking habits among middle-age and elderly in Indonesia is relatively high. The main objective of this study is to present the prevalence of Cardio Vascular Diseases (CVDs) and it's risk factors (smoking and socio-demography) among middle-aged men in Indonesia.

Methods: Data for this analysis was a part of Basic Health Survey (BHS) 2007. Information on socio-demographic characteristics, history of CVDs and smoking behavior were obtained by highly-trained interviewers using a questionnaire which had been tested previously.

Results: A sub-sample of the survey was 92226 males aged 45-97 years. There are tendency that more cigarette smoking and getting older increased risk cardiovascular disease. On the hand among people who had lower household expenditure had less risk to be cardiovascular disease. Compared with those did not smoke, those who smoke cigarette for 1 to 20 and 21 or more stick per day had 15% and 34% more risk to be cardiocardiovascular disease [adjusted relative risk (RRa) = 1.15; 95% confidence interval (CI) = 1.09-1.20; RRa= 1.37 ; 95% CI = 1.27-1.47] respectively. In term of age, compared with those age 45 to 54 years, those who aged 55-64, 65-74, and 75-97 years had 17%, 38%, and 83% to be cardiovascular disease (RRa = 1.19 ; 95% CI = 1.12 – 1.27; RRa = 1.37 ; 95% CI = 1.29 – 1.46; RRa = 1.94 ; 95% CI = 1.84– 2.04] respectively. In term level of household expenditure people with Household expenditure had 7% less to be CVDs (RRa = 1.10; 95% CI = 1.06 – 1.15)

Conclusion: Older age and low house expenditure people and more number of cigarettes trend to increase risk CVDs. Self assessment of age, and number of cigarettes can be used to control the risk of CVDs. (*Health Science Indones 2010; 1: 20 -25*)

Key words: cardiovascular diseases, smoking, older age, Indonesia

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The Framingham study assigned 2 (two) risk points for smoking that seems appropriate for patients who smoked about one pack of cigarettes a day. Those who smoked more than one pack of cigarette a day were extremely at high risk for premature CHDs.¹ A case-control study found that the risk for Myocard infarct (MI) showed a strong dose-response relationship, with a risk of 2.47 for those smoking 1 to 5 cigarettes per day and rising to 74.6 for those smoking more than 40 cigarettes per day compared with nonsmokers.² Cigarette smoking has been associated with sudden cardiac death of all types. Smokers had a RR of 2.5 compared with nonsmokers.²

The other reveals that the lead produced by a cigarette of 0.5 ug. A packet of cigarettes (20 cigarettes contents) which sucked out in one day will generate 10 ug. While the danger threshold of lead that enters the body is 20 ug per day.³

In Indonesia, the prevalence of smoking among males aged 10 years or older increased from 51.3 % in 1995 to 54.5% in 2001.⁴⁻⁶ To reduce the risks of smoking to present and future generation, the World Health Organization (WHO) has encouraged it's member to ratify Framework Convention on Tobacco Control (FCTC).⁷ Unfortunately, until this moment, the Government of Republic of Indonesia has not ratified it. One of the reasons why Indonesian Government has no willingness to ratify FCTC was the perception of lack of local evidences on the health consequences of smoking.

It is therefore, domestic studies on the risks of smoking on CVDs among Indonesian population are needed.

METHODS

This analysis is about smoking behavior and socio-demographic determinant of CVDs among middle-aged Indonesian men using Basic Health Survey (BHS) 2007 data.

The samples for the BHS 2007 were drawn from the National sampling frame developed by the Central Bureau of Statistic. The survey collected data from more than 200,000 households consisting of more than 1.1 million household members. The survey was conducted by the National Institute of Health Research and

Development of the Ministry of Health, Republic of Indonesia.

The data collection was fielded from August 2007 to August 2008 using a set of pre-test questionnaires. Various socio-demographic, economics, and behavioral variables – including smoking and history of diseases were collected. Interviewers were health professionals, who were highly trained to conduct the interviews and to observe certain signs and symptoms of CVDs.⁸

For this paper, the selection of middle age (45 years or over) was designed to allow analyses on the effects of long duration of smoking (of 10 years or more) on CVDs.

The determination of CVDs was made on two methods: First, the criteria of diagnosis CVDs was determined by asking respondents whether they have ever been diagnosed by a health professional (medical doctor) of suffering a CVD. The "yes" answer leads to classification of "diagnosed CVD". Second, respondents who answered "no", then were further observed and asked whether they had ever experienced one of the following signs and symptoms:⁹

- 1) If a respondent reported that he had experienced chest pain or discomfort (angina), felt heavy or feeling of someone was squeezing his heart, felt pain under his breast bone (sternum), in his neck, arms, stomach, or upper back muscles then he was classified as having symptoms of coronary heart disease. The respondents were securely understood that the pain usually occurs with certain activities or emotion. Other symptoms included shortness of breath and fatigue with relatively mild activities (exertion).¹⁰
- 2) If a respondent reported that he experienced disorders of regular cardiac rhythmic (heart beat), the heart beat was too fast, too slowly, or erratically/irregular then he was classified as having symptoms of arrhythmia.¹¹
- 3) If a respondent reported that he experienced: shortness of breath, frequent coughing, especially when he was lying down, swollen feet, ankles, legs, or

abdominal pain, fatigue, dizziness or fainting then he was classified as having symptoms of heart failure.¹²

If a respondent reported or was found of having at least one of the above three conditions, then the respondent was classified as having 'undiagnosed CVDs' for this study. The determination of 'undiagnosed CVDs' was made to accommodate the fact that not all Indonesian have access to health professional or health facility due to financial, geographical, or educational barrier.

The dependent variables were the occurrence of diagnosed or symptom of CVDs. CVDs prevalence was determined by following independent variables: (1) age (year); (2) Level of education (which composed of under junior high school graduated, senior high school graduate and university graduated; (3) level of expenditure (which represented two levels of income); (4) territorial/islands of residence (which composed of Java, Sumatra, Kalimantan, Sulawesi, Bali and Nusa Tenggara, and Maluku and Papua) (5) Status of smoke; smoker and never smoke (6) the number of sticks smoked per day, and (7) duration of smoking (years).

Seven number of determinant were examined as to whether or not they were potential confounder and or interaction. Cox regression with constant time analysis was used in order to determine the confounding effect and to determine the risk factors for CVDs. A risk factor was considered to be a potential confounder if in the univariate test had a P value less than 0.25 considered as candidate for multivariate model along with all known risk factors for CVDs. Statistical analyses were done using Stata released 9 software. The ethical committee of National Institute of Health Research and Development, MOH approved this study.

RESULTS

A sub-sample of the survey was 92226 males aged 45-97 years. Table 1 shows that the

biggest number of sample came from Java island, and the lowest came from Papua and Maluku islands.

Furthermore, based on territory, those who live on the island of Sulawesi more likely had the highest risk to be CVDs. On the hands, the least risk occurred more likely among people from Java island. Compared with who lived in Maluku islands and Papua, those who lived in Sulawesi more likely had 64% increases to be CVDs.

In term level of education, people with lower education more likely had more risk to be CVDs. Compared with those who had post graduate education, people with lower education (illiterate to junior high school) more likely had 37% to be CVDs. Compared with those did not smoke, those who smoke cigarette for 1 to 20 and 21 or more stick per day had 15% and 34% more risk to be cardiocardiovascular disease respectively. In term of age, compared with those age 45 to 54 years, those who aged 55-64, 65-74, and 75-97 years had 17%, 38%, and 83% to be cardiovascular disease respectively.

DISCUSSION

Advanced analysis of Basic Health Survey data in 2007 showed some factor -measurement of risk factors with the occurrence of CVDs in men over 45 years old, among other, in the variable divided respondents age group to age group 45-54 years, 54-64 years, 65-74 years and age group 75 years and above.

On the analysis results shown there is a trend increase in the risk of CVDs in accordance with the age group, that is starting with RR 1.19 in the 54-64 age group to 1.37 in the 65-74 age group and so becomes 1.94 at age group 75 years and above, and as a comparison is the age group 45-54 years. The variable age is the dominant variable occurrence of CVDs this is seen until the final analysis; these variables persist, while crude RR and RR adjust not so different.

Table 1. Some demographic and risk of CVDs among Indonesia Basic Health Survey 2007

	Cardiovascular Disease		Crude Relative Risk	95% Confidence Interval	P
	No (n = 80,491)	Yes (n = 11,735)			
Territory					
Maluku- Papua	3,070	409	1.00	Reference	
Java	30,413	3,507	0.95	0.85–1.05	0.310
Sumatra	22,846	3,489	1.14	1.03–1.28	0.020
Kalimantan	7,973	1,075	1.08	0.96–1.22	0.220
Sulawesi	9,382	2,134	1.64	1.47-1.87	0.000
Bali-Nusa Tenggara	6,806	1,120	1.28	1.14-1.45	0.000
Level of education					
Post graduate	4,521	472	1.00	Reference	
Senior high school	10,843	1,191	0.97	0.86-1.09	0.570
Illiterate-junior high school	65,127	10,071	1.37	1.24–1.51	0.000
Smoking status					
Never	20,952	2,775	1.00	Reference	
Smoked	59,539	8,959	1.14	1.09–1.19	0.000
Duration of smoking					
Never smoked	20,952	2,775	1.00	Reference	
1-10 years	26,143	3,837	1.11	1.06 -1.15	0.000
10 years or more	33,396	5,122	1.17	1.11-1.22	0.000

Table 2. Relationship among number of cigarettes, age, household expenditure and risk of cardiovascular disease

	Cardiovascular Disease		Adjusted relative risk	95% confidence interval	P
	No (n=80,491)	Yes (n=11,735)			
Number of cigarette smoked per day (sticks)					
Never	20,952	2,775	1.00	Reference	
1-20 sticks	52,157	7,714	1.15	1.09-1.20	0.000
21-88 sticks	7,382	1,245	1.37	1.27-1.47	0.000
Age (years)					
45-54	23,417	2,463	1.00	Reference	
55-64	19,012	2,368	1.19	1.12-1.27	0.000
65-74	13,061	1,866	1.37	1.29-1.46	0.000
75-97	25,001	5,037	1.94	1.74-1.92	0.000
Household expenditure					
High	47,851	6,654	1.00	Reference	
Low	32,640	5,082	1.10	1.06 - 1.15	0.000

This is in accordance with a Framingham Study,¹ the risk of coronary heart disease increased by 2-4 times in smokers compared with nonsmokers. This risk increases with age and number of cigarettes smoked. Research shows that smoking risk factors work synergistically with other factors, such as hypertension, fat content or high blood sugar, on the outbreak of CHD.

In the variables of respondents according to levels of education, is seen in the group of respondents with the education of junior high school or below have the risk of CVDs about 1.37 compared to respondents with a graduated of college education, but these variables are not as dominant variable occurrence of CVDs.

Variable respondents according to household expenditure, it turns out the group of respondents with low income have a risk of 1.12 in crude RR compared groups of respondents with high incomes, and this variable includes the variable dominant occurrence of CVDs with adjusted RR of 1.10 is not much different. It is equally with existing research before,¹³⁻¹⁴ the populations with low incomes tend to hit CVDs than the population with high income. In the variable smoking, active smokers were dominant variable occurrence of CVDs, than the group did not smoke, the risk of smokers was 1.14 in the RR crude of incidence CVDs.

In the variable group respondents according to the old smoker over 10 years is greater risk of CVDs that is odd to 1.17 and as a comparison is not smoking, and the group of respondents smoked less than or equal to 10 years and older have a risk of 1.11, by comparison respondents did not smoke, and this variable was not as dominant variable occurrence of CVDs.

Meanwhile in the group based on the number of cigarette smokers were respondents with the number of cigarettes is greater than or equal to 20 cigarettes has a risk by 1.37 times in the RR with the comparison of respondents did not smoke, nor on the respondents who smoked less than 20 cigarettes had a small risk 1,15 in RR a just than the group of respondents does not smoke, and this variable is entered as the

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dominant variable occurrence of CVDs. Result analysis of the status variables and the number of cigarettes smoked were in line with several studies that have been there all along, in some states theory cigarettes contain some substance that is more than 4,000 different chemicals in cigarettes, where the toxic material is more widely available in smoke Besides, for example carbon monoxide (CO) 5 times more common in addition to smoke than primary smoke, benzopiren 3 times, and ammonia 50 times.^{1,2,14}

CO can lead to calcification. Nicotine can interfere with the sympathetic nervous system due to increased myocardial oxygen demand. Besides causing addiction of smoking, nicotine also stimulates the release of adrenaline, increased heart rate, blood pressure, cardiac oxygen demand, and cause heart rhythm disturbances. Nicotine also affects the nerves, brain, and many other body parts. Nicotine activate platelets, with the consequent emergence of platelet adhesion (clotting) into the blood vessel wall.^{1,2,14}

In conclusion, age, household expenditure, status of smoking, and number of cigarettes increased risk for CVDs. Self assessment of number of cigarettes can be used to control the risk of CVDs.

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