

## Characteristics of children with secondhand smoking

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### ABSTRACT

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**Background:** Passive smoking has been known to be associated with the risks of several diseases. Children are a group vulnerable to becoming passive smokers through adjacent adult smokers.

**Objective:** To describe the characteristics of children with secondhand smoking.

**Methods:** This research is a descriptive study involving 39 subjects of grade 4, 5, and 6 elementary school students. Inclusion criteria are having no subjective complaints of respiratory disturbances in the last 1 month, not smoking, living with parents/guardians/other family members that smoke inside the house, and willing to become respondents. Meanwhile, exclusion criterion was not returning the questionnaire. Samples were collected using purposive sampling technique. This study was conducted at Banguntapan Public Elementary School, Bantul in Agustus-September 2015. Instruments used in this study included questionnaires and spirometer. Data were analyzed univariately using frequency distribution.

**Results:** More than half of the respondents were  $\geq 11$  years of age, female in gender, had parents that were  $\geq 40$  years of age, had parents that worked as labors, lived with one smoking family member, had parents that had started smoking at the age of  $< 24$  years old, had parents that smoked  $\geq 9$  cigarettes per day, had parents that smoke outside the house, had parents that are mild smokers, and were not exposed to cigarette smoke. The highest level of education of the respondents' parents was mostly (43.6%) senior high school. Subjective complaints of respiratory disturbances were reported by 74.4% of the respondents.

**Conclusion:** Although no significant signs and symptoms of secondhand smoking were found, children that lived with smoking family members still need to be kept on watch. This is because more than half of the respondents of this study were reporting complaints of respiratory disturbances. Therefore, it is necessary to control the cigarette consumption of parents/guardians, especially of those who still smoke inside the house.

**Latar Belakang:** Perokok pasif telah diketahui berhubungan dengan risiko beberapa penyakit. Anak-anak merupakan kelompok yang rentan menjadi perokok pasif dari perokok dewasa disekitarnya.

**Tujuan:** Untuk mendeskripsikan karakteristik anak dengan secondhand smoke.

**Metode:** Penelitian deskriptif dengan jumlah subyek 39 murid SD kelas 4, 5 dan 6. Kriteria inklusi penelitian meliputi tidak memiliki keluhan gangguan pernafasan dalam 1 bulan terakhir, tidak merokok,

*tinggal bersama orangtua/wali/anggota keluarga lain yang merokok di dalam rumah dan bersedia menjadi responden. Sedangkan kriteria eksklusi penelitian adalah kuesioner tidak kembali. Sampel diambil dengan menggunakan teknik purposive sampling. Penelitian dilakukan di SD Negeri Banguntapan, Bantul pada bulan Agustus – September 2015. Instrumen yang digunakan dalam penelitian ini antara lain kuesioner, dan spirometri. Analisis data dilakukan secara univariat (distribusi frekuensi).*

**Hasil:** *Separuh lebih responden berusia  $\geq$  11 tahun, berjenis kelamin perempuan, orangtua berusia  $\geq$  40 tahun, pekerjaan orangtua adalah buruh, anggota keluarga yang merokok adalah satu orang, orangtua/wali mulai merokok pada usia  $<$  24 tahun, orangtua/wali responden merokok  $\geq$  9 batang/hari, orangtua/wali responden merokok di luar rumah, orang tua tipe perokok ringan dan responden tidak terpapar asap rokok. Tingkat pendidikan orangtua responden sebesar 43,6% adalah tamat SLTA. Berdasarkan hasil spirometri, 74,4% responden mengalami keluhan gangguan saluran nafas.*

**Kesimpulan:** *Meskipun belum ada tanda dan gejala second hand smoke yang signifikan, anak yang tinggal bersama anggota keluarga yang merokok tetap harus diperhatikan. Hal ini dikarenakan separuh lebih responden mengalami keluhan gangguan saluran nafas. Dengan demikian perlu adanya pengendalian jumlah konsumsi rokok pada orangtua/wali terutama yang merokok di dalam rumah.*

## INTRODUCTION

Cigarette smoke contains around 500 harmful gas particles, including tar and nicotine. Passive smokers will sustain the various effects of secondhand smoking on their health. Reports from health ministry of the United States show that children and women are the groups with the highest risk of developing disorders caused by cigarette smoke.<sup>1</sup> Children, infants, and elderlies spend more time staying indoor.<sup>2</sup> In children, the effects of cigarettes are more severe due to their immature immune system, as well as their narrower respiratory tract diameter that allows the amount of cigarette smoke entering their respiratory tract to be greater than their body weight.<sup>3</sup>

A result achieved in 2011, which gives the

lowest contribution and still presents as a health problem, in general, was not smoking inside the house, reaching only a percentage of 46.67%. Results of Basic Health Research (Riskesmas) 2010 showed that the prevalence of smokers in the Special Region of Yogyakarta (DIY) was 31.6% with 66.1% still smoking inside the house. The percentage of non-smoking households in DIY in 2012 was only 44.6%.<sup>4</sup>

Results of the preliminary survey conducted in June 2014 in District Banguntapan on 450 respondents showed that there are 50.89% of active smokers with 25.56% still smoking inside the house. Research on exposure to secondhand smoke on passive smokers is necessary in order to minimize the impact of secondhand smoke in passive smokers, especially children. Therefore, it became our interest to conduct a descriptive study on the characteristic of children with secondhand smoking.

## METHODS

This research is a descriptive study with cross-sectional approach. Samples of the study were all grade 4, 5, and 6 elementary students with active smoker parents/guardians that met the inclusion and exclusion criteria of the study. These samples were collected using purposive sampling technique. The inclusion criteria of this study are: having no subjective complaints of respiratory disturbances in the last 1 month, not smoking, living with parents/guardians/other family members that smoke inside the house, and willing to become respondents. The exclusion criterion of the study was not returning the questionnaire.

The number of samples obtained was 39 students. The study was conducted at Banguntapan Public Elementary School (SD Negeri Banguntapan), Bantul in August-September 2015. Instruments used in this study included questionnaires, weighing scales, microtoise, and spirometer. Data were analyzed univariately using frequency distribution.

**RESULTS**

**Baseline Characteristics of the Respondents**

As presented in Table 1, more than half of the respondents (56.4%) were ≥ 11 years of age and more than half of them (64.1%) were female in gender.

Table 1. Distribution of Baseline Characteristics of the Respondents

Characteristic	n	%
<b>Age</b>		
< 11 years old	17	43.6
≥ 11 years old	22	56.4
<b>Gender</b>		
Male	14	35.9
Female	25	64.1

**Baseline Characteristics of the Parents of the Respondents**

As presented in Table 2, more than half of the parents of the respondents (64.1%) were ≥ 40 years of age. Highest level of education of these parents was mostly senior high school (43.6%). More than half of these parents (59%) worked as labors.

Table 2. Distribution of Baseline Characteristics of the Respondents' Parents

Characteristics	n	%
<b>Ages</b>		
< 40 years old	14	35.9
≥ 40 years old	25	64.1
<b>Level of Education</b>		
Not completed elementary school	1	2.6
Completed elementary school	8	20.5
Junior high school	12	30.8
Senior high school	17	43.6
Academy/university	1	2.6
<b>Occupation</b>		
Labor	23	59.0
Government employee/national army	1	2.6
Private employee	5	12.8
Merchant/entrepreneur	8	20.5
Others	2	5.1

**Distribution of the Number of Smoking Family Member in the Respondents' Households**

As presented in Table 3, the number of smoking family member in the respondents' households was mostly one person (82.05%).

Tabel 3. Distribution of the number of Smoking Family Member

Number of Smoking Family Member	n	%
1	32	82.05
2	5	12.83
3	1	2.56
4	1	2.56

**Determinants of Smoking Behavior in the Parents/Guardians of the Respondents**

As presented in Table 4, more than half of the parents/guardians of the respondents (56.4%) had started smoking every day at the age of < 24 years old. More than half of these parents/guardians (51.3%) had smoked for the first time at the age of ≥ 20 years old. More than half of these parents/guardians (53.8%) smoked ≥ 9 cigarettes per day. More than half of these parents/guardians (64.1%) smoked outside the house. More than half of these parents/guardians (66.7%) were mild smokers.

**Distribution of Cigarette Smoke Exposure Rate to the Respondents**

As presented in Table 5, most respondents (87.2%) were not exposed to cigarette smoke.

**Distribution of Respondents' Complaints of Respiratory Disturbances**

As presented in Table 6, more than half of the respondents (74.4%) were experiencing complaints of respiratory disturbances.

**Distribution of the Results of Respondents' Pulmonary Function Test**

As presented in Table 7, all respondents were showing normal pulmonary function.

Tabel 4. Determinants of Smoking Behavior in the Parents/Guardians of the Respondents

Determinants of Smoking Behavior	n	%
<b>Age of starting to smoke every day</b>		
< 24 years old	22	56.4
≥ 24 years old	17	43.6
<b>Age of smoking for the first time</b>		
< 20 years old	19	48.7
≥ 20 years old	20	51.3
<b>Number of cigarettes/day</b>		
< 9 cigarettes/day	18	46.2
≥ 9 cigarettes/day	21	53.8
<b>Place to smoke</b>		
Inside the house	10	25.6
Outside the house	25	64.1
Near other family member	4	10.3
<b>Type of Smoker</b>		
Mild smoker	26	66.7
Moderate smoker	11	28.2
Heavy smoker	2	5.1

Table 5. Distribution of Cigarette Smoke Exposure Rate to the Respondents

Cigarette Smoke Exposure Rate	n	%
Exposed	5	12.8
Not exposed	34	87.2

Table 6. Distribution of Respondents' Complaints of Respiratory Disturbances

Complaints	n	%
Not present	10	25.6
Present	29	74.4

Tabel 7. Distribution of the Results of Respondents' Pulmonary Function Test

Pulmonary Function	n	%
Normal	39	100
Abnormal	0	0

## DISCUSSIONS

The effect of secondhand smoking in children can be determined by measuring their lung function using spirometry.<sup>5,6</sup> Measurement of lung function on all respondents showed normal results. Although there had been no

significant signs and symptoms, children living with smoking family members should still be kept on watch. This is because despite being a non-smoker, exposure to secondhand smoke will allow them to inhale nicotine and other toxic substances contained in cigarette smoke. Nicotine can still be found in the body of a non-smoker if the person inhales secondhand smoke.<sup>7</sup>

The results of this study cannot be analyzed using bivariate analysis. This is because the pulmonary function test was showing normal measurements in all respondents. There are several possibilities that could cause this, including Firstly, measurement of lung function that was less than optimal. While the measurement of pulmonary function using spirometry can basically be performed on children, it will give optimal results when performed on respondents at the age of 17 years or older. This is because the cooperativeness of the respondents to follow the instructions from the officers during the implementation of the pulmonary function test was fundamental to maintain its validity. Secondly, the number of

samples obtained is too little: only 39 children. The collection of these samples were performed using purposive sampling technique. Upon initial sampling, data from 66 children were included, but on initial data collection using questionnaires, some of these children returned incomplete questionnaires or did not return the questionnaires at all or when questionnaires were taken, the respondents were absent. The number of questionnaires returned at this point was 46. Furthermore, on the second data collection which was the measurement of pulmonary function using spirometry, one child was absent while 6 children failed to follow the instructions for the measurement. Therefore, the total number of respondents remained was 39 children.

Evaluation of cigarette smoke exposure rate to the respondents showed that more than half of them (87.2%) were not exposed to cigarette smoke. Nevertheless, 74.4% of these respondents subjectively reported mild respiratory complaints, such as a cough, runny nose, and shortness of breath in the last 1 month. Children who lived with smoking parents/guardians and were exposed to cigarette smoke still need to be kept on watch even though their percentage was small. Cigarette smoke can inflict damage to ciliated epithelial tissue, decrease mucociliary clearance, and suppress phagocytic activity and bactericide effect of alveoli macrophages that may result in bronchial hyperreactivity.<sup>8</sup> The previous study has shown that the incidence of acute respiratory infection (ARI) in toddlers has a significant association with parental smoking habit inside the house.<sup>9</sup>

According to the results of this study, most respondents (82.5%) were found to be living together with one smoking family member, while a small number of these respondents (2.56%) were living with as many as four smoking family members. The habit of smoking inside the house affects other family members who do not smoke. The results also showed that family members who smoke inside the house could still be found in 25.6% of the data while some were even smoking near other family members in 10.3%

of the data. Cigarette smoke is very harmful to health, especially for toddlers due to the toxic substances contained in cigarettes.<sup>10</sup> Children under five living together with family members who smoke are 4.56 times more likely to suffer from ARI 4.65 than toddlers who live with family members that are not smoking.<sup>2</sup> Lower respiratory tract infections are more common in smokers and passive smokers, especially infants and children.<sup>11</sup>

Exposure to people who do not smoke (passive smoking) is only associated with an increased risk of acute respiratory illness in the first 2 years of life. Exposure from maternal smoking multiplies the risk of lower respiratory tract disease in the first 2 years of a toddler's life by about 2 times.<sup>12</sup> Although this study showed that the pulmonary function in all respondents was normal, subjective complaints of mild respiratory disturbances, such as a cough, runny nose, and shortness of breath in the last 1 month were still reported by 74.4% of the respondents.

## CONCLUSIONS

No significant signs and symptoms of secondhand smoking were found in children that lived with smoking family members as indicated by normal measurements of pulmonary function found in all respondents. However, more than half of these respondents were reporting subjective complaints of respiratory disturbances.

## RECOMMENDATIONS

It is necessary to control the cigarette consumption of the parents/guardians, especially of those who still smoke inside the house.

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