

# Could National Health Insurance Prevent Overweight? A Case Study in Indonesia

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**Abstract**— The prevalence of overweight in Indonesian adults continues to increase and gives the consequence risk of various metabolic syndrome diseases. the National Health Insurance (NHI) provides personal health prevention benefit that is expected to be able to control the prevalence of overweight. The study was aimed to analyze NHI effect to prevent overweight in Indonesia. A cross-sectional study was conducted using the data of the Indonesia Family Life Survey (IFLS) in 2014. The study used 30,113 respondents who were 15-99 years old as inclusion criteria. The data were analyzed by using logistic regression and measuring the adjusted Odd Ratio (OR). The prevalence of overweight was 35% and 45% were not registered as NHI participants. Having NHI could prevent overweight (OR: 0.93, CI: 0.88-0.97) if the health personnel in the primary health care had contact with NHI participants and gave them the health education about overweight prevention. Another finding proved that residing in an urban area increased the risk of being overweight (OR: 1.46, CI: 1.38-1.53) but routine physical activity prevented the risk of overweight (OR: 0.87, CI: 0.83-0.92).

Having NHI could prevent the risk of overweight but a further research was needed for evaluating the effectiveness of contacts between health personnel and NHI participants. Health personnel in the primary health care should increase the content of personal health education about the prevention of overweight to the NHI participants. Indonesian Ministry of Health should provide the policy recommendations on how everyone controlled their overweight through the right regular physical activity.

**Keywords:** *overweight, NHI, IFLS, physical activity*

## I. INTRODUCTION

Globally, more than 1.9 billion adults were overweight and give consequences the risk of various metabolic syndrome disease such as cardiovascular diseases and some cancers [1]–[3]. The main contributing forces in the increasing prevalence of overweight are believed to be the increasing of urbanization and the globalization [4]. In Indonesia, overweight increased to 11% in men and 16% in women over the 14 years period [3], [5]. Prevalence of overweight is high among the productive age, female, smoker, spending

more time with watching television and lack of doing physical activity [3], [6], [7]. Majority of these factors are public health problems that need concerted action from the government.

One of the public health agendas in Indonesia is providing personal health education to the patients through the implementation of National Health Insurance (NHI) [8]. NHI that was implemented in 2014 and was conducted by Health Insurance Agency, commonly known as BPJS Health, gave comprehensive benefit including curative, coordination of service, health prevention and health promotion. NHI in Indonesia does not only give financial protection through providing health services access to the participants, but also health education and screening program to their individual and family by health personnel in the primary health care [9], [10]. However, most of the claims from BPJS Health to the health services spent on curative payment were 16.9 trillion for Non-Communicable Disease (NCD) treatment especially for heart disease (13%), chronic renal failure (7%), cancer (5%) and stroke (2%) [11]. On the other hand, there is no specific format for personal health education to give overweight prevention in the program of NHI [12]. The purpose of this study was to analyse NHI effect to prevent overweight in Indonesia. The result of this study was expected to help the evaluation of overweight control program in Indonesia.

## II. METHOD

This was a cross sectional study; using data from Indonesia Family Life Survey (IFLS). IFLS data were the household surveys or *Survei Aspek Kehidupan Rumah Tangga Indonesia (SAKERTI)*. The data were collected by the RAND Corporations. This survey collected the data from individual respondents, household, community, place of residence, educational facilities, and health services that were used by the community. These surveys could be used as a source of information that was useful to observe the behaviour or state of affairs in a particular time that required government to intervention of aspect such as socio-economic issues, education, and health.

IFLS sampling was done using stratified random sampling with provincial, urban and rural stratification. Enumeration area selected in each stratum and households was selected randomly. The results of a representative sample describe 83% condition in Indonesia [13]. IFLS has been conducted in 5 times since 1993 (IFLS 1), 1997 (IFLS 2), 2000 (IFLS 3) 2007 (IFLS 4), to 2014 (IFLS 5). This study which was conducted in March 2019 used the data from IFLS 5 (2014) aged 15-99 that consisted of 30,113 respondents [13].

The main dependent variable of this study was overweight people or respondents who had Body Mass Index (BMI) more than 25 kg/m<sup>2</sup> and the independent variable was NHI participant. Covariate analysis in this study was developed based on significant previous research about risk factors of overweight including gender, age, a total of a household member, urban area residing, length of education, smoking habit and physical activity routine. The variable of overweight was categorized as being overweight and at risk of overweight.

Characteristics of respondents were presented with mean, standard error (SE), min and max. Bivariate analysis between dependent and each of independent variable was done by using chi-square test. A multivariate logistic regression analysis was done by performing odds ratio (OR) and 95% confidence interval (CI). The assessment of assumption test in multivariate analysis was multicollinearity and heteroscedasticity test. The analysis had multicollinearity problem if value of Variance Inflation Factors (VIF) test >10 and heteroscedasticity problem if p<0.05.

### III. RESULTS

Table 1 shows the characteristics of 30,113 respondents. Among them, 35% were overweight and 45% were not registered as NHI participants. Most of the respondents were female (53%), non-smoker (64%) and had routine physical activity (51%). In this study, mean age of respondents was 38.74 years old with 96 years old as the maximum age of respondents and 17 people as the maximum household member.

The average age of overweight respondents was 41 years old. Overweight respondents who were not registered as NHI participants were 44.52% (Table 2). Female respondents (62.16%), urban area residing (66.29%), non-smoker (71.94%) and lack of doing physical activity (50.82%) had higher proportion of being overweight. Average of respondents who were overweight aged 41 years old and had five household members.

Multicollinearity test showed VIF=9.22, which means that

they had no multicollinearity problem (VIF<10). The heteroscedasticity test showed that there was heterogeneity in variance (p<0.05) so white robust standard error technique was used in the analysis. Figure 1 explains the result of multivariate analysis by using logistic regression. After controlling with the covariate, being NHI participants and doing routine physical activity were associated with the prevention of overweight (OR: 0.93; CI: 0.88-0.97) and (OR: 0.87; CI: 0.83-0.92), respectively. Respondents who were residing in urban area were 1.46 times (CI: 1.38-1.53) increasing the risk of being overweight. Pseudo R<sup>2</sup> of this multivariate analysis was 0.04 which means that the ability of independent variables in associated with overweight was 4%.

### IV. DISCUSSION

The result of this study showed that having NHI could prevent overweight if the health personnel in the primary health care had contact with NHI participants and gave them health education about overweight prevention. Ministry of Health regulates that health personnel in primary healthcare have to contact with minimum 150 NHI participants per month and give them personal health education in order to get full capitation payment from BPJS Health [14].

TABLE I. CHARACTERISTICS OF RESPONDENTS

Variables (n=30,113)	Mean±SE	Min	Max
NHI Ownership			
-NHI Participant	0.55±0.002	0	1
-Non-NHI	0.45±0.002	0	1
Overweight			
-Overweight	0.35±0.003	0	1
-At risk overweight	0.65±0.003	0	1
Gender			
- Male	0.47±0.003	0	1
- Female	0.53±0.003	0	1
Age	38.74±0.093	15	96
Household member	4.00±0.011	1	17
Years of Education	3.24±0.007	1	8
Smoking habit			
- Active smoker	0.36±0.003	0	1
- Non-smoker	0.64±0.003	0	1
Physical activity			
-Routine	0.51±0.002	0	1
-Less	0.4±0.002	0	1

**TABLE II. DISTRIBUTION OF AT RISK AND OVERWEIGHT BY CHARACTERISTICS OF RESPONDENTS**

Variables (n=30,113)	At risk of overweight		Overweight		p value
	n	%	n	%	
NHI Ownership					
- NHI participant	10,846	55.53	5,870	55.48	0.005
- Non-NHI	8,687	44.47	4,710	44.52	
Gender					
- Male	10,305	52.76	4,004	37.84	0.000
- Female	9,228	47.24	6,576	62.16	
Age	37.59 years old		40.85 years old		0.005
Household member	4 persons		5 persons		
Length of Education	3.19 years		3.31 years		0.000
Residing area					
- Urban	10,962	56.12	7,014	66.29	0.000
- Rural	8,571	43.88	3,566	33.71	
Smoking habit					
- Active smoker	8,151	41.73	2,969	28.06	0.000
- Non-smoker	11,382	58.27	7,611	71.94	
Physical activity					
- Routine	10,240	52.42	5,203	49.18	0.000
- Less	9,293	47.58	5,377	50.82	

However, it was contradicted with other study that states health insurance did not have any effect for the prevention of individual health outcome [15], because public health insurance only subsidizes individuals' curative medical expenditures which allows the medical spending for the poor [16]. Whereas, in America, Health Care Insurance Reform give benefit to the individuals who were overweight to receive obesity treatment in the health services [17]. Furthermore, there is a strong positive association between insurance and preventive effort of participants in Colombia [18]. One of the health insurance problems in giving prevention program of overweight is the adequate preparation of management and model of program [19]. According to Jarlenski et. al., there are several benefits that can be applied by health insurance for the prevention of overweight such as gym memberships, financial incentives for weight loss and commercial weight loss programs [20].

The result of this study found that NHI participants who were overweight were 35%. This is consistent with the most characteristics of Indonesian adults who are overweight and at risk of being diagnosed with NCD [21], [22]. One of the NHI health prevention programs in Indonesia is called PROLANIS that is giving health education to the NHI participants who have hypertension and diabetes mellitus in the primary health care [23]. Another health insurance program that can be implemented for the overweight prevention is jogging with the participants, giving health education about healthy meal, giving eating choice, doing daily appropriate physical activity and giving the assessment of BMI [24]. This program can also be implemented by

health personnel in the primary health care for overweight prevention program to the NHI participants.

Multivariate analysis result of this study found that residing in urban area increased the risk of being overweight. It might be due to 33.5% population in the urban area are less doing physical activity [25]. There are also several factors that contribute to overweight in urban area such as various kinds of transportation mode and online shopping habit that might reduce the activity movement [26], [27].

This study also found that physical activity could prevent the risk of being overweight but age and length of education may increase the risk of overweight. Previous studies on the association between physical activity and overweight show that physical activity is able to prevent the risk of overweight [28], [29]. Whereas, younger age and low education level also contribute to the risk of overweight [30]. However, Joen et.al. reports that higher education level increases the risk of overweight especially for women [31]. The difference in the finding regarding the association between education level and the risk of overweight in Indonesia and other studies might be due to the relationship between the overweight and happiness, prestige, and prosperity was positive in Indonesia [32]. Therefore, Indonesian Ministry of Health should constantly promote social campaigns for overweight prevention. Health personnel also should strengthen the promotion of an appropriate and consistent physical activity among people and encourage patients who were overweight to lose their weight.

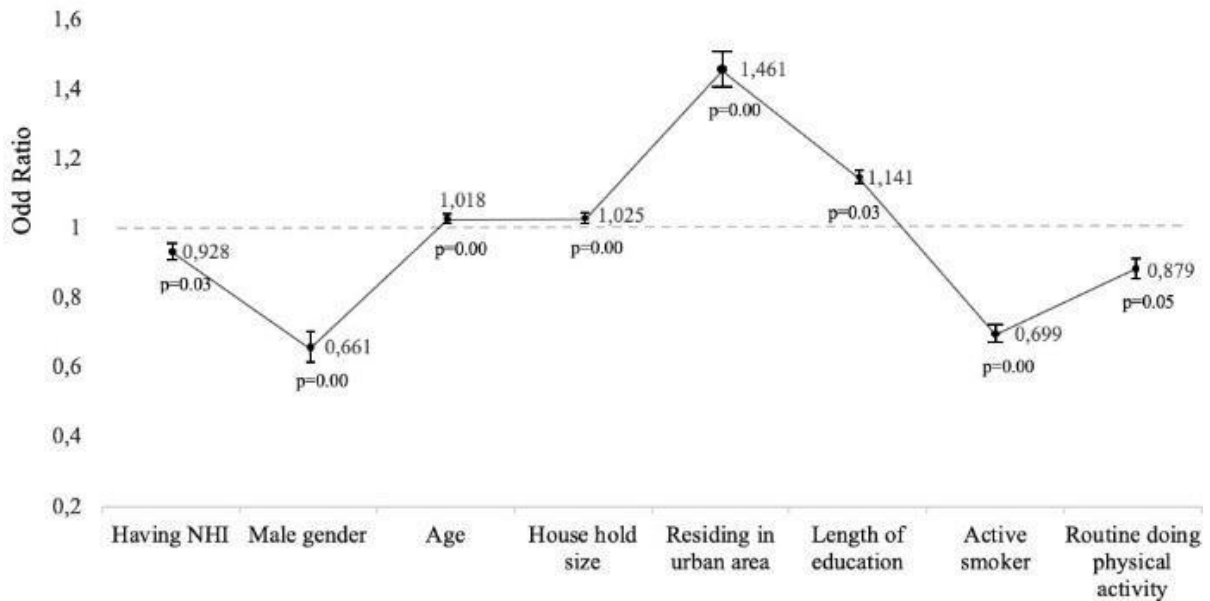


Fig. 1. Odd Ratio and 95% Confidence Intervals for the Risk of Overweight

The limitation of this study was the IFLS 2014 data. It was the only data that the researchers used to know the effect of NHI in preventing overweight. Further study can be conducted by using series data of IFLS to know the effect between treatment and control groups, and also to explore the effect of NHI between the type of participants (contributory premium and subsidize) to the prevention of overweight.

V. CONCLUSION

Having NHI could prevent the risk of overweight but a further research was needed to evaluate the effectiveness of contacts between health personnel and NHI participants. Health personnel in the primary health care should strengthen the health education on overweight prevention to the NHI participants specifically and whole community generally, and suggest an appropriate physical activity.

ACKNOWLEDGMENT

The authors received no financial support for the study, authorship, and publication of this article. The authors thanked Rand Corporation for providing data of IFLS 2007 and 2014. This study was not financed because the data were taken from Rand Corporation which could be accessed on <http://www.rand.org/labor/FLS/IFLS/download.html>.

CONFLICTS OF INTEREST

The authors declare that there was no conflict interest in this study.

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