

Several dominants risk factors related to obesity in urban childbearing age women in Indonesia

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Received: February 20, 2015; Revised: April 14, 2015; Accepted: May 25, 2015.

Abstrak

Latar belakang: Prevalensi kegemukan pada perempuan semakin meningkat terutama di daerah perkotaan yang dapat menyebabkan meningkatnya risiko penyakit kronis. Penelitian ini bertujuan untuk menganalisis beberapa faktor risiko dominan terhadap obesitas pada wanita usia subur yang tinggal di daerah perkotaan di wilayah perkotaan di Indonesia.

Metode: Naskah ini memakai sebagian data Riset Kesehatan Dasar (Riskesdas) 2007 data. Subjek terdiri dari 76408 wanita di usia subur (15-49 years) tinggal di daerah perkotaan yang dengan status gizi normal dan gemuk yang berasal dari 258366 rumah tangga. Data Riskesdas tentang faktor-faktor sosio-demografi dan lainnya dikumpulkan dengan kuesioner. Status gizi diukur dengan menggunakan indeks massa tubuh (IMT) yang dikategorikan menjadi normal, (18,5–24,9) dan gemuk (27 atau lebih). Analisis menggunakan regresi Cox dengan waktu yang tetap.

Hasil: Pada analisis ini terdapat 18,8% (14357) wanita obese dan 81,2% (62052) normal. Wanita berusia 25-49 tahun memiliki 3,5 kali lipat risiko lebih besar menjadi obese [risiko relatif suaian (RRa) = 3,49; $P = 0,000$], dan yang bercerai atau menikah berisiko 2,5 kali lipat lebih tinggi terhadap obesitas (masing-masing RRa = 2,58; $P = 0,000$ dan RRa = 2,62; $P = 0,000$). Wanita tidak bekerja berisiko lebih tinggi untuk menjadi obese (RRa = 1,06; $p = 0,000$). Selanjutnya, mengkonsumsi protein berlebih, dan sering makan makanan berlemak memiliki risiko lebih tinggi terhadap obesitas, (RRa = 1,09; $P = 0,000$ dan RRa = 1,17; $P = 0,000$).

Kesimpulan: Wanita berusia 25-49 tahun, bercerai atau menikah, pengangguran, mengkonsumsi protein berlebih, dan sering mengkonsumsi makanan berlemak mempunyai risiko obesitas lebih tinggi. (*Health Science Journal of Indonesia 2015;1:63-8*)

Kata kunci: obesitas, perkotaan, wanita usia subur

Abstract

Background: The prevalence of women suffered from obesity is elevating, mostly in urban areas. This could lead problems especially for chronic diseases. This study aimed to analyze several dominant risk factors related to obesity in childbearing age women living in urban areas in Indonesia.

Methods: This analysis used a part of Basic Health Research (Riskesdas) 2007 data. The samples were derived from 258366 households. Riskesdas data on socio-demographic and other factors was collected by questionnaire. Nutritional status was measured using body mass index (BMI). Cox regression with constant time analysis was used for the analysis.

Results: This analysis noted that there are 14357 (18.8%) of women were obese and 62052 (81.2%) normal. Compared with the respective reference groups, women aged 25-49 had a 3.5-fold greater risk of becoming obese [adjusted relative risk (RRa) = 3.49; $P = 0.000$], and divorced or married had 2.5-fold higher risk to be obese (RRa = 2.58; $P = 0.000$ and RRa = 2.62; $P = 0.000$, respectively). Furthermore, unemployed women had higher risk to be obese (RRa = 1.06; $P = 0.000$), and consuming excess protein as well as often consume fatty foods made women had a higher risk of obesity (RRa = 1.09; $P = 0.000$ and RRa = 1.17; $P = 0.000$, respectively).

Conclusion: Women aged 25-49, divorced or married, unemployed, consumed excess protein, and often consume fatty foods have a higher risk for becoming obese. (*Health Science Journal of Indonesia 2015;1:63-8*)

Key words: obesity, urban, women

Prevalence of overweight and obesity has increased over time, both in the developed and developing countries. In the past several decades, obesity has even been considered as a threat and a challenge for the public health sector in international and national levels. The evidence shows that obesity has doubled over the last 20 years. In 2008, more than 1.4 billion adults (> 20 years) in the world suffer from overweight, 200 million men and 300 million women are obese.¹

Based on the results of Indonesian nationwide health survey, Basic Health Research (Riskesdas) year 2007,² the prevalence of obesity on adults (> 15 years) is 19.1 (8.8% overweight and 10.3% obese). The obesity prevalence of those living in urban areas was higher than in rural areas, which is 23.8% compared to 15.3%, respectively. The prevalence of central obesity in women (29%) was higher than men (7.7%).

Adults who are obese have a higher risk of serious health problems such as coronary heart disease, hypertension, dyslipidemia, stroke, type 2 diabetes, some forms of cancer that led to death in young age. In the world, 65 percent of people living in a country in which overweight and obesity causes more deaths than underweight.¹ Besides increasing the risk of degenerative diseases, obesity also influences fertility. Men or women who have a body weight below or above normal have higher risk not only against chronic diseases but also reproductive problems. Especially for women who are obese, also at greater risk of experiencing lower back complaints and osteoarthritis especially in the knee joint due to obesity. This is caused by excessive pressure on the joints in the knee pads.

Various things can cause obesity, including lifestyle such as tobacco consumption, alcohol consumption, low rate of physical activity, food consumption factors, stress.³ Obesity can be affected also by hormonal factors,⁴ environmental, and psychological factors also culture³ which influence more the incidence of obesity in women than in pria.³ In Indonesia, based on the characteristics, obesity tend to be higher in population who is living in urban, women, educated, and pursuing high economic status.²

Although the relationship between obesity and physical activity, food consumption and alcohol consumption have been extensively analyzed in several studies, but the relationship between these factors to obesity, especially in urban childbearing age women is limited. This study aimed to analyze several dominant risk factors related to obesity in childbearing age women living in urban areas in Indonesia.

METHODS

This study used a cross-sectional study as part of Basic Health Research (Riskesdas) data, 2007, the only national-wide survey that includes consumption and physical activity as variables. The sample of Riskesdas is identical with the National Socio-Economic Survey (SUSENAS), 2007 which apply two stage sampling design. Samples derived from 33 provinces and 438 districts/cities in Indonesia. Probability proportional to size was applied to get 17.150 census block (CB). Simple random sampling was used in every census block to obtain sample at the household level (16 households) per census block.

The data consisted of 258366 households, and 987205 household members. The population in this study was all women in childbearing age in Indonesia aged 15-49 years old, according to the definition of women of childbearing age (*wanita usia subur –WUS*) by the National Family Planning Coordinating Board (BKKBN).^{5,6}

This study analyzed 99044 women aged 15-49 years old who lived in urban area. To strengthen the findings, the data analysis limited to the group of normal weight and the group of obesity, yet the underweight and overweight respondents were excluded. Therefore, the study consisted of 76408 samples. The dependent variable in this study is nutritional status (normal weight, and obese).

The independent variable in this study consisted of socio-demographic factors (marital status, occupation, education, economic status, had children under-five, number of family member), lifestyle (smoking, mental emotional problem, physical activity) and food intake (protein, energy, sweetened food and beverages, fatty food, innards, additional flavored food). Measurement of height and weight of the respondents were conducted by trained enumerators.

Body weight was measured on digital scales with 0.1 kg precision and height was measured using a microtoise with precision of 0.1 cm. Data on socio-demographic were obtained through interviews using a questionnaire. Food consumption data were obtained through 24-hour food recall.

In this study, nutritional status was calculated based on body mass index (BMI) by calculating the weight in kilograms divided by height in meters squared, and categorized according to WHO Asia-Pacific criteria. Normal nutritional status is respondent within

BMI 18.5–24.9 kg/m², and obese is referred to the respondent who had BMI ≥ 27 kg/m². Categories of protein and energy intake was defined based on the recommended dietary allowance (RDA) by Ministry of Health.⁷ Recommended protein intake for women are 69 gram for aged 15 years, 59 gram for aged 16-18 years 56 gram for aged 19-29 years, and 57 gram for aged 30-49 years. The recommended energy intake for women are 2125 kcal for aged 15-18 years, 2250 kcal for aged 19-29 years, and 2150 for aged 30-49 years. Meanwhile, the consumption of sweetened food and beverages, fatty food, innards, additional flavored food categorized as ‘often’ if the respondent consumes at the food at least once a day.⁸

Physical activity was categorized as ‘enough’ if the activities were being carried out continuously for at least 10 minutes in at least 5 days a week and totally 150 minutes of cumulative moderate physical activity or 75 minutes of vigorous activity for one week. In addition to frequency, we also look at the type or intensity of physical activity, i.e. the number of days of ‘heavy’, ‘medium’ and ‘light’ activity. The calculation of the number of minutes of physical activity in a week, also weighting the type of activity, four times for ‘heavy’ activity, twice for ‘medium’ activity towards ‘mild’ activity.²

Independent variables associated with over-nutrition in the bivariate analysis with p value of less than 0.25 were candidate risk factors included to calculate the multivariate analysis. The Cox regression analysis with stepwise forward method was performed for building the final selected model.

RESULTS

Total number of women in childbearing age with complete data on nutritional status was 76,409. This analysis noted 14,357 (18.8%) women in childbearing age living in urban areas were obese and 62,052 (81.2%) were normal.

Table 1 shows that the prevalent of obesity was similarly distributed with respect to socioeconomic status. Furthermore, Table 1. also shows that compare with the respective reference groups, women aged 25-49, married as well as divorced, unemployed had more risk to be obese. On the other side, compare with the respective reference group, women completed senior highschool or higher, had 1-4 family member/s, had children under-five had lower risk to be obese.

Table 1. Socio-demographic factors, lifestyle and the risk of obesity on urban childbearing age women in Indonesia, 2007

| | Nutritional Status | | | | Crude Relative Risk | 95% confidence interval | P |
|----------------------------|---------------------|------|----------------------|------|------------------------|-------------------------------|----------------------------------|
| | Normal (n=62052) | | Obesity (n=14357) | | | | |
| | n | % | n | % | | | |
| Age group | | | | | | | |
| 15-24 | 21754 | 95.1 | 1128 | 4.9 | 1.00 | Reference | 0.000 |
| 25-49 | 40298 | 75.3 | 13229 | 24.7 | 3.49 | 3.24-3.76 | |
| Marital status | | | | | | | |
| Single | 20317 | 95.2 | 1033 | 4.8 | 1.00 | Reference | 0.000 |
| Divorce | 2586 | 79.4 | 671 | 20.6 | 2.59 | 2.32-2.88 | |
| Married | 39149 | 75.6 | 12653 | 24.4 | 2.61 | 2.41-2.83 | |
| Employment | | | | | | | |
| Employee | 32117 | 85.3 | 5523 | 14.7 | 1.00 | Reference | 0.000 |
| Unemployed | 29934 | 77.2 | 8833 | 22.8 | 1.07 | 1.03-1.11 | |
| Completed education level | | | | | | | |
| Junior highschool or lower | 32162 | 79.7 | 8205 | 20.3 | 1.00 | Reference | 0.000 |
| Senior high + | 29889 | 82.9 | 6152 | 17.1 | 0.82 | 0.79-0.85 | |
| Socioeconomic status | | | | | | | |
| Quintile 1 | 10619 | 81.8 | 2366 | 18.2 | 1.00 | Reference | 0.682 0.301 0.093 0.676 |
| Quintile 2 | 11984 | 81.8 | 2675 | 18.2 | 0.99 | 0.93-1.05 | |
| Quintile 3 | 12311 | 80.8 | 2926 | 19.2 | 1.03 | 0.97-1.09 | |
| Quintile 4 | 13752 | 80.8 | 3264 | 19.2 | 1.05 | 0.99-1.11 | |
| Quintile 5 | 13384 | 81.1 | 3127 | 18.9 | 1.01 | 0.95-1.07 | |
| Number of family member | | | | | | | |
| 5 or more | 30467 | 82.2 | 6579 | 17.8 | 1.00 | Reference | 0.000 |
| 1- 4 | 31584 | 80.2 | 7777 | 19.8 | 0.90 | 0.87-0.93 | |
| Had children under-five | | | | | | | |
| No | 39510 | 81.1 | 9180 | 18.9 | 1.00 | Reference | 0.000 |
| Yes | 22541 | 81.3 | 5177 | 18.7 | 0.77 | 0.75-0.80 | |

Table 2 shows that the prevalent of obesity was similarly distributed with respect to the recommended energy intake, and whether yes or not often consume innard. In addition, Table 2. shows that compare with the respective reference group, women who had mental emotional problem, not smoke, consumed protein more than the recommendation, often consume fatty food, and often consume additional flavored food had higher risk of obesity. Meanwhile, compare with the respective reference group, women who had less physical activity, often consume sweetened food and beverages lower risk to be obese.

Our final model, Table 3, women aged 25-49, divorce or married, unemployed, low educated, consumed protein more than the recommendation, and often consumed fatty food, had a higher probability to be obese. Compare to women aged 15-24, women aged 25-49 had a 3.5-fold greater risk to be obese ($RRa = 3.49$; $P = 0.000$). Compare to single women, divorce or married women had more than a 2.5-fold greater risk to obesity ($RRa=2.58$; $p=0.000$ and $RRa=2.62$; $p=0.000$, respectively). Furthermore, compare to working women, unemployed women had six percent greater risk to be obese ($RRa = 1.06$;

$P = 0.000$). In addition, compare to the reference group, women who had consumed more protein more than the recommendation, and often consume fatty food had higher risk of obesity, 9 percent ($RRa = 1.09$; $P = 0.000$) and 17 percent ($RRa = 1.17$; $P = 0.000$) respectively.

DISCUSSION

Our final model suggested that women aged 25-49, divorce or married, unemployed, consumed protein more than the recommendation, and often consume fatty food, had a higher risk to be obese.

Women age 25-49 years old had more than three times higher than women age 15-24 years old. This finding supported by a study from urban population in Iran which reported that particularly in women, the rate of obesity was raised by increasing age.⁹ A systematic review showed that in developed countries men older than 10 years showed higher rates of overweight and obesity than women. Meanwhile, in developing countries, women have higher rates than men older than 25 years.¹⁰

Table 2. Lifestyle and the risk of obesity in urban childbearing age women in Indonesia, 2007

| | Nutritional Status | | | | Crude Relative Risk | 95% confidence interval | P |
|---|--------------------|------|-----------------|------|---------------------|-------------------------|-------|
| | Normal (n=62052) | | Obese (n=14357) | | | | |
| | n | % | n | % | | | |
| Smoking | | | | | | | |
| Yes | 1519 | 78.8 | 409 | 21.2 | 1.00 | Reference | |
| Not | 60532 | 81.3 | 13948 | 18.7 | 1.09 | 0.99-1.21 | 0.071 |
| Have mental emotional problem | | | | | | | |
| No | 57413 | 81.3 | 13190 | 18.7 | 1.00 | Reference | |
| Yes | 4638 | 79.9 | 1167 | 20.1 | 1.14 | 1.08-1.21 | 0.000 |
| Physical activity | | | | | | | |
| Enough | 1524 | 77.6 | 440 | 22.4 | 1.00 | Reference | |
| Less | 60527 | 81.3 | 13917 | 18.7 | 0.91 | 0.83-1.01 | 0.051 |
| Consumed protein more than the recommendation | | | | | | | |
| No | 46346 | 83.2 | 9339 | 16.8 | 1.00 | Reference | |
| Yes | 15706 | 75.8 | 5018 | 24.2 | 1.03 | 0.99-1.08 | 0.120 |
| Consumed energy more than the recommendation | | | | | | | |
| No | 54821 | 82.1 | 11968 | 17.9 | 1.00 | Reference | |
| Yes | 7230 | 75.2 | 2389 | 24.8 | 1.01 | 0.96-1.06 | 0.746 |
| Often consume sweetened food and beverages | | | | | | | |
| No | 19166 | 79.6 | 4918 | 20.4 | 1.00 | Reference | |
| Yes | 42885 | 82.0 | 9439 | 18.0 | 0.90 | 0.87-0.94 | 0.000 |
| Often consume fatty food | | | | | | | |
| No | 53065 | 81.6 | 11955 | 18.4 | 1.00 | Reference | |
| Yes | 8987 | 78.9 | 2401 | 21.1 | 1.11 | 1.07-1.17 | 0.000 |
| Often consume innards | | | | | | | |
| No | 60803 | 81.2 | 14059 | 18.8 | 1.00 | Reference | |
| Yes | 1248 | 80.8 | 297 | 19.2 | 0.96 | 0.85-1.08 | 0.494 |
| Often consume additional flavored food | | | | | | | |
| No | 13002 | 83.0 | 2658 | 17.0 | 1.00 | Reference | |
| Yes | 49049 | 80.7 | 11699 | 19.3 | 1.04 | 0.99-1.08 | 0.082 |

Table 3. Relationship socio-demographic and lifestyle and obesity on urban childbearing age women in Indonesia, 2007

| | Nutritional Status | | | | Adjusted Relative Risk | 95% confidence interval | P |
|---|---------------------|------|--------------------|------|------------------------------|----------------------------|-------|
| | Normal (n=62052) | | Obese (n=14357) | | | | |
| | n | % | n | % | | | |
| Age group | | | | | | | |
| 15-24 | 21754 | 95.1 | 1128 | 4.9 | 1.00 | Reference | 0.000 |
| 25-49 | 40298 | 75.3 | 13229 | 24.7 | 3.49 | 3.24-3.76 | |
| Marital status | | | | | | | |
| Single | 20317 | 95.2 | 1033 | 4.8 | 1.00 | Reference | 0.000 |
| Divorce | 2586 | 79.4 | 671 | 20.6 | 2.58 | 2.32-2.87 | |
| Married | 39149 | 75.6 | 12653 | 24.4 | 2.62 | 2.42-2.84 | 0.000 |
| Employment | | | | | | | |
| Employee | 32117 | 85.3 | 5523 | 14.7 | 1.00 | Reference | 0.000 |
| Unemployed | 29934 | 77.2 | 8833 | 22.8 | 1.06 | 1.03-1.10 | |
| Consumed protein more than the recommendation | | | | | | | |
| No | 46346 | 83.2 | 9339 | 16.8 | 1.00 | Reference | 0.000 |
| Yes | 15706 | 75.8 | 5018 | 24.2 | 1.09 | 1.05-1.13 | |
| Often consume fatty food | | | | | | | |
| No | 53065 | 81.6 | 11955 | 18.4 | 1.00 | Reference | 0.000 |
| Yes | 8987 | 78.9 | 2401 | 21.1 | 1.17 | 1.12-1.22 | |

*Adjusted each other between variables listed in this table and education, number of family member, and have children under-five, smoking, and sweetened food and beverages consumption.

The results showed that unemployed women had higher risk to be obese. This result supported by a study in Spanish population that revealed that in women, obesity was found to be associated with being unemployed or working at home (OR 1.6; 1.08-2.4).¹¹ The finding could be linked to the physical activity undertaken at work and its influence to obesity, as a study showed that for those not in paid employment (retired, homemaker, or unemployed) the average physical activity level were only half as great as those for professionals and administrators and only one-third as much as for factory workers.¹²

Married women had higher risk to be obese than single or ever married women. This finding supported by a study in the Kingdom of Saudi Arabia that revealed that among women risk of obesity increase with being married or previously married compared with those never married.¹³ Married women tend to change lifestyle, including diet, and tend to have higher appetite. A cross-sectional study showed that marital status significantly associated with weight gain over two years of marriage, this is due to the increased influence of excessive appetite that cannot be controlled.¹⁴

This study also revealed that eat more protein and often consume fatty food had slightly higher risk of obesity. This finding was in accordance with theory

that too much consumption than recommended will increase the risk of obesity.¹⁵ In addition, people living in urban are shifting toward increased animal-source food intake and "Western diet" which define as high intakes of refined carbohydrates, added sugars, fats, and animal source foods which contains protein and fat. This trend were documented in all urban areas in low and middle income countries.¹⁶ Beside, there is an important challenge of today's condition, especially in urban area, is that so called obesogenic environment is conducive to the consumption of energy and unfavourable to the expenditure of energy.¹⁷

High intake of fatty food might also influenced by high intake of vegetable oil, which also increased between three to sixfold in developing countries. People prefer fried food because it flavored better. For example, a prospective cohort study conducted in workers in East Kalimantan found the mean intake of trans fatty acid was 0.48% of total dietary calories, with fried food contributing half of this (0.20%).¹⁸

Acknowledgments

The authors wish to thank Prof. Bastaman Basuki for technical assistant during preparation of this paper.

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