Original Article 🔓

Prevalence of Obesity in Malaysia: Perspectives in Terengganu towards Development of Malaysian Obesity DNA Bank

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Abstract

A normal health status is highly depends on body weight. Many health problems may occur or impose risk for extremely obese individuals. Etiopathology of obesity includes interaction of several factors inclusive of genetic and non-genetic factors such as lifestyle changes. This study aimed to launch Malaysian Obesity DNA Bank and determine the prevalence of obesity along with anthropometric measurements of the subjects. The cross-sectional study was conducted on total of 340 subjects (obese = 95, overweight = 122 and normal = 123), aged 19-60 years, in Terengganu. The BMI and well appropriate anthropometric measurements (waist circumference, hip circumference, waist to hip ratio, fat percentage and ASindex) were determined through standard protocols and formulae. The mean difference of anthropometrics was determined by independent t-test. Data was analysed using SPSS ver.16.0.0. The BMI was determined for all subjects and it was found that out of 340 subjects, a total of 95 (27.9%) subjects were obese , followed by a total of 122 (35.8%) subjects were overweight and normal individuals were 123 (36.1%). The mean of the BMI, WHR, Fat% and ASindex, in Malay obese were 32.83, 0.88, 33.5 and 13.21 respectively, while in normal healthy individuals were 22.1, 0.78, 24.2 and 20.1 respectively. The difference of mean of BMI, WHR, Fat% and ASindex was calculated to be 10.73, 0.1, 9.3 and 6.89 respectively. To the best of our knowledge, this is the first report in Malaysia, reporting that this is very first Obesity DNA Bank in South East Asia region and prevalence of obesity in Terengganu, Malaysia to be 27.9%. In addition, it indicates a significant mean difference for anthropometric measurements among obese and normal individuals. For Asindex calculations suggest that the prevalence of genocide obesity is greater 89.9% of android obesity in Malay obese attributes

Introduction

Overweight and obesity are serious health concerns for both worldwide and in Malaysia. Etiopathology of obesity includes interaction of several factors inclusive of genetics and non-genetic factors such as lifestyle changes (low physical activity (PA), increased sedentary behaviour and unhealthy eating habits) [1]. Globesity as per defined by WHO, obesity is major health problem in many parts of the world, specifically in Malaysia [2]. Till date, Malaysian association for the study of obesity has been determining the nutritional based associations of obesity based on NHMS surveys as shown in table 1. Obesity has risen to be doubled in last two decades in Malaysia [3]. The current prevalence 17.7% of obesity in Malaysia is higher than world overall prevalence of obesity that is 13% in 2014. Prevalence of abdominal obesity have increased from 14% (2006) to 15.1% (2011) and from 39.5% (2006) to 45.4% (2011), respectively [4].

Table 1. Prevalence of Obesity in Malaysia	Year
Prevalence of overweight 30.0% is plateauing but obesity 17.7% is still rising	NHMS, 2015
29.45% Overweight and 15.1% Obese	NHMS, 2011
29.1% Overweight and 14.0% Obese	NHMS III, 2006
16.6% (overweight) and 4.4% (Obese) adult population	NHMS II, 1996

NHMS: National Health and Morbidity Survey

The pathophysiology of obesity being multifaceted disorder, involves interaction of environmental, behavioural, non-genetic and genetic factors. Genetic factors may influence metabolism or diet intake thus leading to increased adiposity [5].

Methods

This cross-sectional study was aimed to determine the prevalence of obesity in Terengganu along with anthropometric measurements of the subjects. This study was conducted with ethical approval and consent on a total of 340 subjects, aged 19-60 years. The BMI was determined for all subjects and it was found that out of 340 subjects inclusive of obese = 95, overweight = 122 and normal = 123. The subjects were recruited to develop record for Malaysian Obesity DNA Bank at UniSZA, Terengganu. The recruitment of subjects (n = 340) prior to genetic screening was done after ethical approvals. The recruitment was done in three stages; pre-screening

via official letters and phone communications based on health promotions, followed by screening phase via BMI calculations based on WHO criterion [6] and last stage of enrolment of subjects to be involved in this study. The BMI and well appropriate anthropometric measurements (waist circumference, hip circumference, waist to hip ratio, fat percentage and ASindex) were determined through standard protocols and formulae. The data was analysed using SPSS.ver.16.0.0. The difference of means was determined by independent t-test, while means and frequencies were calculated through basic mathematical calculations.

Results & discussion

In order to understand the interaction and role of different genes reported to be involved in obesity pathophysiology are being studied by group of researcher in Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA), Terengganu [7]. It was launched as Malaysian Obesity DNA Bank at UniSZA. The recruitment of subjects (n = 340) prior to genetic screening was done after ethical approvals. The recruitment was done in three stages; pre-screening, followed by screening phase via BMI calculations based on WHO criterion [6] (WHO, 2000) and last stage enrolment of subjects to be involved in study [2,7].

However, based on database from Malaysian Obesity DNA Bank, the several studies have been conducted to elucidate multifactorial pathophysiology interaction of obesity. A systemic review was conducted to determine non-genetic or social factors associated with obesity among Malays obese community [8]. Among findings the low self-esteem, body image & weight dissatisfaction, diet & eating habits, health knowledge, low physical activity, media influence, religious practices were associated with obesity in Malaysia. In conclusion, these factors have profoundly strong connection with obese individual's people in the Malaysia. Researchers were focused on genetic and nutrient problem of obesity [5,9,10]. Out of 340 subjects it was found that a total of 95 subjects (27.9%) were found to be obese as per WHO criterion (World Health Organization, 2000) for BMI, a total of 122 subjects were overweight (35.8%) and normal BMI individuals were 123 (36.1%) [2]. Results are demonstrated in table 2.

Table 2. Prevalence of obesity in Terengganu	
Status	**n (%)**
Obese	95 (27.9%)
Overweight	122 (35.8%)
Normal	123 (36.1%)

Besides that, the comparative anthropometric measurements between obese and normal healthy individuals are of great importance for the underlying pathology associated with obesity. Classical anthropometric measurements (waist circumference, hip circumference, body mass index, waist to hip ratio and body fat percentage) were determined beside determination of a novel ASindex [hip – waist (cm)] [11]. The means of the BMI, WHR and Fat%, in Malay obese were 32.83, 0.88 and 33.5 respectively; while in normal healthy individuals were 22.1, 0.78 and 24.2 respectively. The difference of mean of BMI, WHR andFat% was calculated to be 10.73, 0.1 and 9.3 respectively that indicate a significant difference of mean among obese and normal individuals.

Conclusion
To the best of our knowledge this is a data for the record of very first Obesity DNA Bank in South East Asia region and in future undertakings, the data will be not only helpful for developing anti-obesity strategies in Malaysia but genetic data will also complement HapMap and Malaysian node of Human Variome Project (HVP) in future. It is the first report in Malaysia, reporting the prevalence of obesity in Terengganu in 2018 considering it to be 27.9% with prevalence of overweight to be 35.8%. In addition, it is indicating a significant mean difference for anthropometric measurements among obese and normal individuals.

Reference
1. Institute for Public Health. National Health and Morbidity Survey 2011. *Non-Communicable Disease*. NHMS 2011; *Vol. II.*
2. Hassan B, Atif AB, Saif UK, Norizan AG, Ahemed ZAL, Nordin, S. Prevalence of Obesity in Malay population in Malaysia Based on the BMI Status; A study in Terengganu. Research Journal of Pharmacy and Technology. 2017; 10(12).
3. Ghee LK. A Review of Adult Obesity Research in Malaysia. *Med J Malaysia*. 2016; *71*: 1.
4. Fadhli Y, Azahadi O, Noor Ani A, Balkish M, Ahmad Jessree K, & Tahir A. Approaches in methodology of a population-based study in Malaysia: The National Health and Morbidity Survey 2011 (NHMS 2011). *Malays J Med Health Sci*. 2013; *9*: 25–33.
5. Ilyas M, Atif A, Al-Hatamleh M, Al-Shajrawi O, Ariff T ,et al. Rising Trends of Obesity in Malaysia; Role of Inflammation and Inflammatory Markers in Obesity Related Insulin Resistance: A Nuclear Factor Kappa B (Nfkb) Perspective. Curr Trends Biomedical Eng & Biosci. 2017a; 10(4): 555793.
6. World Health Organization. (2000). *Obesity: preventing and managing the global epidemic*. World Health Organization.
7. Atif AB, Emilia A, Aliya S, Ramla F, Ahmed ZAL, Nordin S. Malaysian Obesity DNA Bank; Towards Developing Anti Obese Nation Wide strategy. Research Journal of Pharmacy and Technology. 2017a; 10(12).
8. Ullah S, Ghani NA, & Baig AA. A Systematic Review of Determinant-Social Factors Related to Obesity among Malays Obese Community in Malaysia. 2018.
9. Al-Hatamleh MA, Arif MT, Ilyas MN, Nordin S, Ahmed ZAL, Atif AB. Molecular Characterization of the Promoter Region of the Vascular Endothelial Growth Factor (VEGF) Gene; Towards its Involvement in Susceptibility to Obesity in Malay Obese Attributes. Research Journal of Pharmacy and Technology. 2017;10(12).

10. Ilyas MN, Atif AB, Yasrul IA, Al-Hatamleh MA, Ahmed ZAL, Nordin S. Fat-Mass and Obesity-Associated (FTO) Gene Polymorphism (rs9939609): Genotypic, Allelic Frequency in Malay Obese Attributes. Research Journal of Pharmacy and Technology. 2017b; 10(12).
11. Ilyas MN, Atif AB, Saif UK, Emilia A, Al-Hatamleh MA, Zahri K et al. Comparative analysis of the Anthropometric Indices between Malay Obese Attributes and Normal Healthy Individuals. Research Journal of Pharmacy and Technology. 2017c; 10(12).

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