

## Short Communication

### EFFECT OF BREAKFAST TYPE ON BMI

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#### ABSTRACT

*Breakfast is an important meal which mainly replenishes the energy that is depleted after fasting, during the night's sleep. The type of breakfast consumed is widely different among individuals; however, an individual tends to consume a particular type of breakfast quite regularly. The type of breakfast consumed regularly could have certain implications. A study was done to correlate the Breakfast Type and Body Mass Index (BMI) in some students of SEGi University College (SEGi UC). The findings of the study showed that the students who consumed a particular type of breakfast – namely, Nasi Lemak – had a comparatively higher BMI than those who opted for breakfast of other types. Possible reasons for, and implications of, the findings are discussed.*

#### 1.0 Introduction

“Breakfast” is the combination of two words which are “break” and “fast”. It refers to the breaking of the fast after the last meal a day before (Kosti *et. al.*, 2003). In general, it is the first meal taken in the morning upon arising from sleep. It is an important meal as it provides the nutrients that humans need to start off the day right. Breakfast mainly replenishes the supply of glucose which is the body's main energy source that depletes after fasting.

In most cases, people tend to consume the same type or types of breakfast regularly or habitually, for several reasons such as convenience and time available for preparation, preference and choice of individuals, budget limitation etc. The quantity of breakfast consumed varies widely among individuals, and some practically do not eat breakfast at all; and some eat breakfast irregularly in terms of the number of times per week.

Physical status of individuals in terms of body weight, i.e. thin, normal, fat, is represented by the BMI which is calculated as the weight in kilogrammes divided by the height in metres squared ( $\text{kg}/\text{m}^2$ ). For adults,  $\text{BMI} < 18.5$  is considered underweight,  $\text{BMI} > 25$  is overweight, and  $\text{BMI} > 30$  is obese. Being overweight or obese is a risk factor which can trigger several diseases such as coronary heart disease, Type 2 diabetes, certain cancers, hypertension, stroke, liver and gall bladder diseases, respiratory problems, osteoarthritis etc. Hence, an optimal body weight should be maintained for health reasons.

Several factors influence the BMI of individuals. Regarding breakfast, the amount consumed (quantity) as well as the type (quality) of breakfast may influence the BMI. A study shows that an obese person is prone to skip breakfast leading to a high caloric intake at night, whereas a person with a normal BMI has a caloric intake which is more evenly

distributed throughout the day (Ma *et. al.*, 2003). The study also shows that late-night eating results in the stored glycogen which is then converted into fat unless it is burned as fuel, thereby causing weight gain.

At present, the general perception is that the bodyweight of Malaysians, including university students, has been increasing significantly, but the seriousness of the problem is somehow ignored by a majority of the population. The Health Minister pointed out that the prevalence of adult obesity in Malaysia from 1996-2006 has more than tripled, accounting for four of every ten Malaysians above 18 years of age.

The type of diet, namely the quantity and quality of meals, may be one factor that is responsible for this state of affairs. As explained above, breakfast is the most important meal of the day (Kosti *et. al.*, 2003). The top six types of breakfast that Malaysians consume are: *Nasi Lemak*, *Roti Canai*, Toast, Half-boiled Eggs, Cereals and Noodles. To find out the effect of the type of breakfast on the BMI of university students, a study was done by the First Year medical students of SEGi UC, Kota Damansara, Selangor, as part of the Mini-research Programme.

## 2.0 The Study

One hundred female students of SEGi UC were selected as the test subjects in accordance with the inclusion and exclusion criteria. Male subjects were not chosen since they have a higher physical activity rate per day compared to females, so that presumably the BMI is not attributed only to the consumption of breakfast.

Breakfast types were categorised into two independent groups: *Nasi Lemak* and Others consisting of *Roti Canai*, Bread, *Mee*, Eggs, Cookies etc. This is because *Nasi Lemak* was consumed as a breakfast entity by a large percentage of the test subjects, while the test subjects that consumed particular items of Others were quite small in number individually and scattered.

For the collection of data:

1. The height and bodyweight of individual subjects were measured, for calculation of the BMI using the formula:  
$$\text{BMI} = \text{weight in kg} \div \text{height in m squared (kg/m}^2\text{)}$$
2. The test subjects filled up a questionnaire consisting of seven sections:
  - a) The background/demographic information
  - b) The breakfast pattern
  - c) The breakfast type
  - d) Other meals taken in a day
  - e) The lifestyle
  - f) The family background
  - g) Any co-morbidity

The caloric value of the breakfast consumed by each test subject was calculated according to the Table 1 below.

**Table 1: Types of Breakfast in Malaysia and Caloric Counts (NutriWEB)**

<b>Food</b>	<b>Serving Size</b>	<b>Calories</b>
<i>Nasi Goreng</i>	1 plate	330
<i>Bandung Noodles</i>	1 bowl	450
<i>Kueh Tiau Bandung</i>	1 bowl	410
<i>Curry Mee</i>	1 bowl	250
<i>Nasi Dagang</i>	1 plate	450
<i>Mee Hoon Bandung</i>	1 bowl	245
<i>Nasi Briyani (Rice Only)</i>	1 plate	245
<i>Nasi Lemak</i>	1 plate	230
<i>Mee Soup</i>	1 bowl	563
<i>Roti Telur</i>	1 piece	135
<i>Fried Kueh Tiau</i>	1 plate	170
<i>Roti Canai</i>	1 piece	95
<i>Capati</i>	1 piece	100
<i>Fried Mee Hoon</i>	1 plate	170
<i>Fried Mee</i>	1 plate	170
<i>Chicken Rice</i>	1 plate	250
<i>Rawadosai</i>	1 piece	85
<i>Putu Bamboo</i>	1 piece	66
<i>Dosai</i>	1 piece	80
<i>Whole Meal</i>	1 serving	185
<i>Enriched White</i>	1 serving	200
<i>Cocoa Crispies (Nestle)</i>	1 cup	120
<i>Honey Stars (Nestle)</i>	1 cup	120
<i>Coco Crunch (Nestle)</i>	1 cup	120

The statistical analysis was done to find out:

1. If there was any significant difference in the BMI between the two groups of the test subjects, i.e. those taking *Nasi Lemak* or Others for their breakfast;
2. The correlation between the overall calories consumed and the BMI;
3. If there was any possible correlation between the genetic factor (overweight parents) and the BMI; and
4. If there was any possible correlation between the exercise/physical activity and the BMI.

### **3.0 Results & Findings**

It was discovered that:

1. The test subjects that consumed *Nasi Lemak* for their breakfast had higher BMIs than those that consumed Others ( $p < 0.001$ );
2. There was a significant correlation between the overall calories consumed and the BMI ( $p < 0.001$ );
3. A majority of the test subjects fell under the Underweight and Normal categories of the BMI despite having overweight and obese parents.
4. A majority of the test subjects who exercised more frequently had normal BMIs. Some of the test subjects who were overweight and obese exercised minimally.

### **4.0 Discussion**

The female test subjects were deliberately selected for the study because they were choosier in their dietary habits: mostly sticking to their favourite foods rather than opting for varieties. These test subjects from SEGi UC were selected for easier collection of data, considering the time allotted for the Mini-research Programme.

Twenty-six per cent of the test subjects were found to consume *Nasi Lemak* regularly for their breakfasts. *Nasi Lemak*, apart from being very tasty and quite filling, is also comparatively less expensive. These facts have to be taken into account considering that most of the test subjects were from out-of-town and with limited allowances. Even if they should opt for a more wholesome home-cooked food, it was not feasible. Besides, *Nasi Lemak* was readily available from stalls in the vicinity of SEGi UC.

One obvious reason for the high BMI in the test subjects who consumed *Nasi Lemak* regularly was because of its high calorie count, especially when the standard fare was supplemented by the add-ons such as eggs. It was substantiated by the calculations in the study.

Another possible reason for having high BMI in certain test subjects may be due to the familial or genetic tendency. However, in the present study, a strong link was not observed between the two parameters: many test subjects whose parents were overweight had normal or below normal weights. The reason for the observation could be because the test subjects were still young, active and away from home most of the time, hence they are less exposed to the usual quality and quantity of the family meals which might influence their bodyweights.

Another factor that influences the bodyweight is the exercise/physical activity. A relationship between the BMI and the exercise/physical activity seemed to be in existence. Those who were overweight and obese seemed to do less exercise. For many of the test subjects, their daily UC activities – lectures, practicals, clinics etc. – coupled with the walking to and fro between the hostel and SEGi UC seemed to be of enough exercise. However, those test subjects who exercised regularly were found to have normal BMIs.

A relatively small size of the sampled population was the main limitation of the present study. A larger sample size of the population would have rendered a more realistic and representative statistical calculations.

### **5.0 Conclusion**

From the present study, it may be concluded that the type of breakfast influences the BMI of individuals, and the main reason is the caloric content of different foods. Since being overweight and obese is a risk factor for many disease conditions, one should maintain the bodyweight within the normal limit. One way to do so is to make a proper choice of diet during meals.

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