

## **Impact of the relationship between obesity and food intake patterns among Sri Lankan people**

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### **Abstract**

In the present situation non communicable diseases are spread soon and obesity can be identified as a reason for that. It means the surplus fat of our meals is stored in stomach, breast and back side in our body. As a result of this the person will be suffered from the obesity. Waist circumference, body mass index are used to define the obesity. Obesity will be a main reason for such diseases as heartaches, high blood pressure, asthma, cancers, mental diseases, joint problems. When considering the present situation of Sri Lanka a number of 92530 of men and 269269 women are suffered from obesity. Accordingly the research problem of this study is the effect of food consumption for the obesity during 1980-2013. The independent variable is food consumption and the factors that affect to the independent variable is carbohydrate, lipid, milk, pulse and sugar. In this research secondary data was collected by the annual report of census and statistics department about income and expenditure of households. Dependent variable was obesity and data was collected by annual health report. A multiple regression was conducted with these data. Also graphs were used to identify the variation of obesity and food consumption during years. It was admired by 95% significant level and effect of lipid was ( $p=.016$ ) and the effect of carbohydrate was ( $p=.049$ ). Accordingly carbohydrate and lipid has affected to the obesity. Genetic, physical activity, gender, age, economic level, pregnancy, mental stress, are affected to the obesity and the main point is the foods which our body is consumed does not dissolve. Then they are kept in our body in an unnecessary way. That means food consumption affects to the obesity in Sri Lanka

**Key words:** *Non Communicable Diseases, Food Consumption, Fat, Obesity*

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## **Introduction**

Now a day's obesity is a common problem in our society. Non communicable diseases have become the biggest threat to the health of individuals in the 21<sup>st</sup> century. This is directly related to the epidemic of obesity. Simply obesity means having too much body fat. According to world health organization (WHO) over weight and obesity are defined as abnormal or excessive fat accumulation and it may impair health (WHO, 2013).

According to the above facts the high obesity means a situation which there is more strong foods of adipose tissue of a human being or an animal.

Although obesity seems to be a single problem of one human. It is a world-wide health problem. Such as, cardiovascular diseases (mainly heart disease and stroke) diabetes, musculoskeletal disorders (especially osteoarthritis a highly disabling degenerative disease of the joints), some cancers (including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney and colon). We can identify different causes in obesity. Obesity can accrual any time in life and today is rapidly increasing in childhood controlling it needs a life cycle approach. This increase is not confined to developed economics. But also to economics in transition especially in urbanized population.

Body mass index (BMI) is the main index which is used to measure the obesity. According to WHO (2015) if BMI is between 25-29.9 degree it is defined as overweight, If BMI is more than 30 degree then it is defined as obesity. If BMI is under 18.5 it is defined as low weight and also if BMI between 18.5-24.9 it is called as healthy weight.

In 2014, more than 1.9 billion adults 18 years and older were overweight of these over 600 million were obese. In Sri Lanka, there were women 71073 and men 21639 between 25-29.9 BMI .30>BMI there were 21457 women and 5290 men. Currently obesity rate is increasing rapidly. Various factors should occur for this. We can identify two main types; first one is socio economic factors, other one is socio demographic factors.

“Factors are genetics. Medical conditions, emotional disorders, smocking, pregnancy lack of, sleep, under genes and family history can also increase a child obesity. Low fruit intake, snack intake, urban living spend hours in front of TV and computer games are increase for obesity” (Anonymous).

Therefore food consumption is a main factor for obesity. “The increasing trend of consuming high food creates an imbalance if the energy level of the body and lead to weight gain and obesity (Blundell & Gille, 2001).

It’s not doubtful that the amount of calories, consume the same number of calories that the body burns overtime, and weight stays stable. (Chan T.H)

Dairy food comprises a range of different products with varying nutritional components. In the context of a healthy diet. Dairy food may provide protection against and amelioration of chronic diseases related to obesity. (Warensjo Eva, Deborah. N. Linda P.2010)

Many factors including behavioural, environmental, cultural and socioeconomics influences. Affected by the food choices of people. These choices which affects the balance of energy intake, combined with genetic and metabolic factors determine body weight and consumption (Anderson, Rafferty, Callo, Fussman & Limes, 2011).

In this case my objective is to learn how to occur food consumption for obesity. Let’s look how the food consumption in Sri Lanka had influenced.

## **Obesity**

Obesity is a wide topic. There have many sub topics. Such as obesity obese, overweight, low weights, abdominal obesity and health weight.

According to WHO (2015) say “overweight and obesity are defined as abnormal or excessive fat accumulation they may impair health”

Obesity means having too much body fat. It is not the same as overweight which means a child weight is in the upper range of children of the same age and height overweight may be due to extra muscle, bone or water as well as too much fat. Both mean that a child’s weight is higher than what is thought to be healthy (Anonymous).

Other definition “An accumulation of excess body fat that acts as independent risk factors for such diseases”

There are many ways in which a person’s health in relation to their weight can be classified. But the most widely used method is body mass index (BMI).

These types are 18.5 to 24.9 means healthy weight, 25 to 29.9 overweight, 30 to 39.9 obese .40 or above severely obese.18.5 below low weight.

Obesity means a disease marked by excessive generalized deposition and storage of fat with a BMI of over 30.

Overweight means a condition where the person weights more than what is considered normal for that height, age and sex. Low weight means a person whose body weight is considered too low to be healthy. The definition usually refers to people with BMI under 18.5 or a weight 15 to 20 below that normal for their age and height group.

Healthy weight is a weight that lowers your risk for health problems. For most people BMI and waist size are good ways to tell if they are at a healthy weight.

Abdominal obesity also known as central obesity .is when excessive abdominal fat around the stomach and abdomen has built up to the extent that it is likely to have a negative impact on health

Now we can identify various types of obesity.

## **Factors**

**Lipid (fat) and obesity:** “A change in habits leading to an overall restriction in calories and the promotion in calories and the promotion of physical activity is a much more desirable strategy in the treatment and prevention of obesity than the treatment and prevention of obesity than the apparently promising restriction of lipids in isolation.(Garcia L P ;2002,67-72)”

“Obesity is considered a public health problem because it is associated with multiple risk factors that place individuals into a significantly high risk group for corny heart disease. The cardiovascular dysmetabolic syndrome seen conjunction with obesity is not only associated with insulin resistance and hypertension but also involves an abnormal metabolism of lipids.”(Susanme B N, 1999)

**Protein and weight:** higher protein diets seem to have some advantages for weight loss. There are few reasons for earning higher calories from protein. Such as moves satisfy, greater thermic effect and it improve body composition. High protein diet improves blood lipid profit. So they may help

prevent heart disease and diabetes. But some high protein foods are healthier than others. Incorporation of pulses and wholegrain foods into a weight loss program resulted in a greater reduction in waist circumference compared with the group consuming a control diet, although no difference in weight loss was noted between groups.”(Ven B.J; 2010)

“Investigate the optimal amount of pulses to consume for weight control, and include behavioural elements to help overcome barriers to pulse consumption” (Megan A,Bruce R, Jennifer C, Petra E;2010)

“Eating pulses has long been known as a healthy option for losing weight, but they have also now been proven to keep the pounds off” (Gallager P 2016)

**Carbohydrates and weight:** miles, refined grains and the food made with them white rice, white bread, white pasta is in rapidly digested carbohydrates. Eat more carbohydrates means more weight. Their for controllable diet plan only have less carbohydrates. “This is because the high glycaemic index in those foods causes a sudden increase in blood sugar if not utilized by the body builds up as fat similarly processed carbohydrates or high calorie sugars predispose to the development of diabetes and cardiac diseases besides causing obesity.”(Aul S; 2016)

“Carbohydrates are among the macro nutrients that provide energy intake and can thus contribute to excess energy intake and subsequent weight gain”(vandam R M,seidell J.C; 2007). “Consuming a low-carbohydrate (approximately < 47) diet is associated with greater likelihood of being overweight or obese among healthy, free living adults (Merchant AT,vatnparst H,Baralas S,dehdhan M,shah s M,De Koning L,Stec S.E;2009)

**Sugar and weight:** sugary drink increases the risk of weight gain obesity and diabetes. Sugary drink should have higher percentage of diabetes. The lot of studies shows the children and adults have cutting back on sugary drinks can lead to weight 10-55. “milk, like any other food you consume, contains calorie.an 8 ounce glass of whole milk contains approximately 150 calories;2% milk contains about 140 calories;1% contains about 100 calories; skim milk (non-fat milk) contains about 80 calories .consuming too many calories is what causes people to gain weight.”(Anonymous)

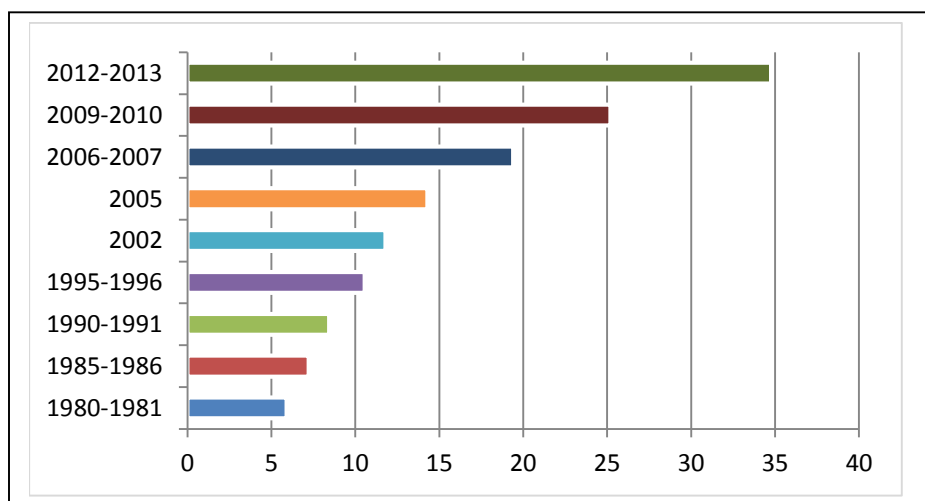
“Those women who avoided milk were about half as likely to have the metabolic syndrome when compared to milk drinkers benefited from lower insulin resistance levels, lower triglyceride levels, lower BMI’s (an indicator for obesity)and higher levels of that healthy HDL Cholesterol” (Fleming A;2006)

**Milk and weight:** high dairy or calcium intakes help with weight loss. And also people who increased their yogurt intake. Gained less weight and also increase in milk and cheese intake did not appear to promote weight loss or gain. ‘’The data suggest that the change in body fatness that occurs with modifying intake of sugars results from an alteration in energy balance rather than a physiological or methobolic consequence of monosaccharaides or disaccharides. Owing’ to the multifactorial cause sot obesity.( Holmerg S; 2013)

“WHO has developed guidance on free sugars intake, as shown below, based on the impact of free sugars intake on weight gain and dental caries. Current evidence suggest that increasing consumption of sugar sweetened beverages is associated with overweight and obesity in children.”(WHO 2013).

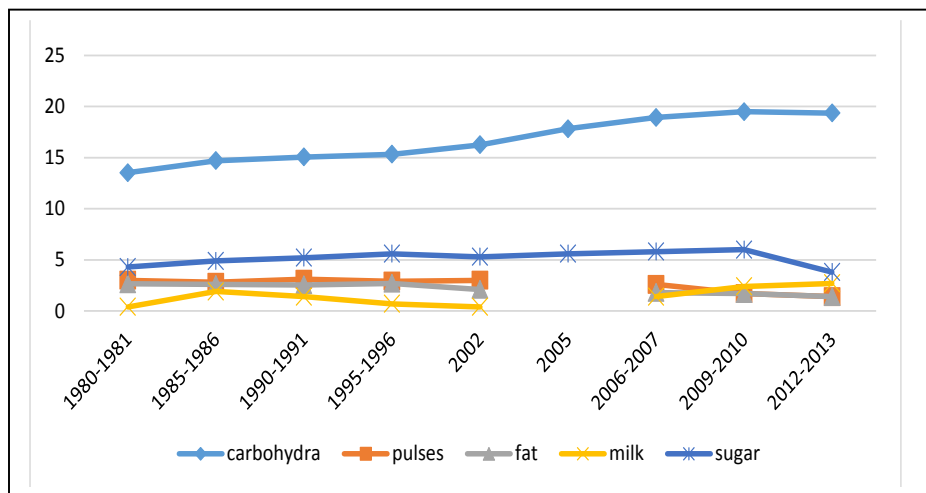
## Methods

Figure 1: Obesity Rate



Source: Annual health bulletin,

Figure 2: Food Consumption in Sri Lanka



Source: Household income and expenditure survey

Secondary data were used to analyse the data in this task. it means the obesity rate and food consumption in Sri Lanka during 1980 – 2013. the data for food consumption was got using house holding incoming expenditure survey report. Rice, wheat flour and bread as carbohydrates and meat and vegetable as and sugar. Pulses and milk were got as food. Consumption multiple regressions were used to recognize this relationship within variables. this experiments was done. Under 0.05 significant levels.

H1: Carbohydrate and obesity have a relationship.

H2: The relationship between fat and obesity

H3: The relationship between pulses and obesity

H4: The relationship between milk and obesity

H5: The relationship between sugar and obesity.

X1: carbohydrate, X2: fat, X3: pulses, X4: milk, X5: sugar

Table 1: Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Std;error	Beta		
(constant)	-60.585	36.580		-1.656	.240
Carbohydrate	1.192	.974	.224	1.223	.049
Fat	34.202	4.314	.957	7.928	.016
Pulses	-1.228	6.161	-.034	-.199	.860
Milk	-5.599	1.330	-.496	-4.211	.346
Sugar	-2.286	.879	-.171	-2.600	.122

Source: Author, 2016

Table 2: ANOVA

Model	Sum of squares	Df	Mean square	F	Sig.
Regression	700.501	5	140.16	54.1	.018
1		2	0	77	
Residual	5.172	7	2.586		
Total	705.673				

Source: Author, 2016

This is the table that shows the output of the ANOVA analysis and whether there is a statically significant difference between these variables. We can see that the significance value is 0.018.which is below 0.05 therefore this model



is overall statically significant .it means there is a linear relationship between independent variables and dependent variables.

Coefficient table show, we can see that the predictor variables of lipid (fat) carbohydrate are significant because both of their p-value are 0.000.however the p-value for milk (p=0.346), sugar (p=0.860), pulses (p=0.122) is greater than the common alpha level of 0.05, which indicates that is not statistically significant. So there is not a relationship between pulses and obesity, milk and obesity, sugar and obesity. From the above hypothesis 95% was examined by significant level. The hypothesis says obesity is not a relationship between pulses, milk, and sugar are accepted. It is H0 (null hypothesis).It means pulses, milk, sugar, don't affect to the obesity rate.

Multiple regression models are mentioned by above table.

$$Y = -60.585 + 1.192 + 34.202 - 1.228 - 5.599 - 2.2864$$

According to this model when carbohydrate is increased by one until obesity rate will increase by 1.192 units. Also when fat is increased by 01 unit obesity rate will increase up to 34.202 units. Next when pulses is increased by one unit obesity rate decreases by 1.228 units. Next when milk is increased by one unit obesity rate will decrease by 5.559 units. When sugar is increased by one unit obesity rate will decrease by 7. 286.

## Conclusion

When it comes to the overall significance it is statistically significant. It means there is a linear relationship between independent variable and dependant variable.

According to above information what we can say is that fat affects the obesity. Also Carbohydrate is a fact that affects the obesity. When we consider with other facts even though sugar affects the obesity it is not significant statistically. Milk and pulses do not affect the obesity. According to these facts it is possible to say that physical activity, food consumption, Genetic lack of sleep affect the obesity. Also Carbohydrate and fat clearly affects to the food consumption.

When we consider the present situation in Sri Lanka obesity has been increased and mainly food consumption with the lack of nutritious foods is a main reason for this matter.

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