



Assessing Dietary Habits in Various Categories of BMI among the Teenagers

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Abstract

Purpose: The world today consists of 10-19 year olds who are the largest generation and they are increasing day by day. Their eating habits can be determined by the amount and type of food and food products they consume. Diet is the major concern amongst that population; the concept of balanced diet which includes vitamins, proteins, fats, carbohydrates and minerals has become just a definition to the society. Improper eating habits can lead to an unhealthy lifestyle which in turn leads to health related issues. Body Mass Index, usually known as BMI is distinctively affected by the dietary pattern of an individual. BMI is a simple weight for height index expressed in kg/m^2 . According to WHO, BMI is classified into different classes according to the scoring, which are Underweight (below 18.5), Normal (18.5-24.9), Overweight (25.0-29.9), Obesity class I (30.0-34.9), Obesity class II (35.0-39.9), Obesity class III (≥ 40.0). BMI above or below 'normal' range can lead to excessive health irregularities like premature health complication also leading to early grave. **Method:** A cross-sectional study was conducted amongst 110 individuals from age 10-19 years. These individuals were explained about the study and written consent was obtained. The questionnaire was customised according to Indian eating habits and was validated by the ethical committee. It was then distributed to the students recruited and was explained to them in their comfortable language. **Result:** The study result shows 55% of subjects have BMI within normal range. The subjects with 'normal' BMI are seen to have healthy dietary pattern as compared to subjects of 'overweight' BMI. The subjects with 'normal' BMI consumed pulses, green vegetables, milk and milk products, fruits and fruit juices on regular basis. And the subjects with BMI of 'overweight' and 'obese' are seen to be consuming junk food and high caloric value items like sugary drinks and sweet. They are also seen to eat out of boredom and have high consumption of bakery products like cakes and biscuits. **Conclusion:** The study results concluded presence of health awareness amongst the teenagers.

Keywords: BMI (Body Mass Index), Diet, Obesity, Overweight, Teenagers, Underweight.



Introduction

Eating habits are determined by what and how people eat, select their food and how they obtain their food. Dietary pattern such as eating food which is high in vegetables, fruits, fibers and low in saturated fat, sugar and salt can help in maintaining a healthy weight. Particularly, dietary pattern which includes regular breakfast consumption has been associated with lower body weight.¹The teenagers today crave burgers and pizza rather fruits and vegetables. These changes are considered to be the main reasons for the increase in prevalence of both overweight and obesity among children, adolescents in the last few decades. Many college students experience changes in their lifestyle and a weakening of dietary habits during their college years. Several studies have reported that college students have inappropriate eating habits such as skipping meals, having intake of high fat and sodium but low calcium and iron. According to World Health Organizations(WHO) report, there is a correlation between low Physical Activity (PA) on the one hand, and improper diet, excessive weight and obesity on the other.²Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight, underweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²).³ WHO in 1997 provide the classification for Body Mass Index. It was distinctively classified into four main categories i.e. underweight (below 18.5), normal (18.5-24.9), overweight (25.0-29.9) and obesity (30.0-40.0).⁴ Extreme body mass index (BMI that is either very high or very low) has been associated with increased risk of adverse outcomes in adolescents.⁵ Teenage population and their health is a very special issue and is a center of attention globally for numerous reasons. Today's world is home to the largest generation of 10-19 year olds and their population is continuously increasing day by day.⁶Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended.⁷Obesity can be divided into two types, gynoid (pear shaped) which is commonly seen in the females with fat accumulation mostly around the gluteal region (hip) and android (apple shaped) which is commonly seen in the males with fat accumulation concentrated around the abdominal region (stomach).⁸ Underweight is defined as a person whose body weight is considered too low to be healthy. Underweight people have a body mass index (BMI) of less than 18.5⁹ or a weight 15% to 20% below that of normal for their age and height group.¹⁰Raised BMI is a major risk factor for non-communicable diseases like cardiovascular diseases (mainly heart disease and stroke), diabetes, musculoskeletal disorders (especially osteoarthritis – a highly disabling degenerative disease of the joints) and some cancers (including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon).⁷ The adolescent period is characterized by its rapid physical and psychological changes in the individual, together with increasing demands and influence of peers, school and wider society. It is well documented that behaviors developed during this period influence health in adulthood. Several health compromising behaviors like smoking or consuming alcohol are adapted by teenagers. Health enhancing behaviors like physical exercise or playing sports is also adopted in adolescence and they often persist into adulthood. The WHO estimates that 70% of premature deaths among adults are due to behaviors like smoking, illicit drug use, reckless driving is initiated during adolescence. Therefore, helping adolescents establish healthy lifestyles and avoiding any



development of health risk behaviors is crucial and should be started before these behaviors are firmly established. Physical activity has been promoted as a means to reduce the risk of obesity and depression. The American College of Sports Medicine and the American Heart Association recommend that healthy young adults should exercise at moderate intensity for at least 30 minutes for 5 days each week or at vigorous intensity for at least 20 minutes for 3 days in a week. The primary adverse event of physical activity is injury, which acts as primary reason for individuals to stop exercising. Although limited evidence is available, but amongst those several studies suggest that moderate levels of physical activity may reduce the risk and duration of upper respiratory tract infections in young adults compared to physically inactive or highly active individuals. While weight loss has been shown to compromise immune function, moderate exercise as part of a weight loss program may boost the immune system and reduce the incidence and duration of illness.¹¹

Method and Materials: A cross-sectional study was conducted amongst 110 individuals of both the genders with age group from 10-19 years. These individuals were explained about the study and written consent was obtained. The questionnaire was customised according to Indian eating habits and was validated by the ethical committee. It was then distributed to the subjects recruited and was explained to them in their comfortable language. The subjects with recent fractures in past 6 months, any musculoskeletal injuries or any congenital conditions were excluded. Subjects were selected on the basis of simple random sampling method. The height and weight of the subjects were measured using the measuring tape and weighing machine respectively and the BMI was calculated according to the formulae using a standard calculator. The data collected was analysed accordingly.

Data Analysis: The data was analyzed using MS- EXCEL. A spreadsheet was used enter the data which included the demographic data, height, weight, BMI and questions related to their diet.

Result: The study result shows 55% of subjects having BMI which is in normal ranges. The subjects with 'normal' BMI are seen to have healthier as compared to subjects of 'overweight' BMI. The subjects consumed pulses, green vegetables, milk and milk products, fruits and fruit juices on regular basis. And the subjects with BMI of 'overweight' and 'obese' are seen to be consuming junk food and high caloric value items like sugary drinks and sweet. They are also seen to eat out of boredom and cakes along with biscuits.

Discussion: This study was carried out to assess the eating habits amongst the teenage population and categorized them according to their Body Mass Index. About 110 subjects had consented to be a part of this study. The subjects included both males and females of age group from 15 to 19 years which is represented in table 2 and 1 respectively. This study shows that the subjects were well aware about healthy eating and are considerate about their weight. 55% subjects have their body mass index in the normal range according to the WHO classification of BMI. 44% of the subjects participated were vegetarians 45% were non-vegetarians and 11% were eggitarians. 62% of subjects consume about 3 to 4 meals per day.



52% of the subjects don't drink adequate amount of water in a day which is 3-4 liters. According to the previous studies they suggest that low water intake can result in rapid obesity as well as other health complications like constipation. Dehydration interferes with physical and cognitive performance and other system complications.¹² There is an insight to the consumption of dairy products by the subjects which is 46% on a daily basis amongst the population. Various studies report dairy products remain an important dietary source of multiple micronutrients, including calcium, phosphorus, magnesium, zinc, iodine, potassium, vitamin A, vitamin D, vitamin B12 and riboflavin (vitamin B2).¹³ 35% of the subjects consume fruits on a daily basis where as 52% of the subjects agree to consuming fruit juices once a week. As per the previous studies fruit juices contain high amount of sugar than 100-g portion of fresh fruit. The study shows that the participants consume lesser amount of fruit juice as compared to raw fruits. Excess sugar intake shows direct and positive co-relation to BMI and weight gain.¹⁴ 35% of the population consumes vegetable at least once in the period of two days and 44% consume starch on a daily basis. Fruit and vegetable intake not only reduces blood pressure and improves micro vessel functions, but also has useful effects against cardiovascular risk factors such as BMI, waist-measurement, total cholesterol, low density cholesterol, inflammation and oxidation stress. Also theories proved that the intake of fruits in adolescents has a significant positive correlation between fruit intake frequency at dinner and body weight as well as BMI.¹⁵ 35% of the population consumes pulses once per day. The non-vegetarian populations has a food habits about 19% of the subjects consume meat/pork/fish etc. on weekly basis. Adolescence is a critical period of growth and development, so good nutrition is essential and the need for most nutrient's including energy, protein, vitamin and minerals increase.¹⁶ 54% of the subjects consume junk food twice or more times a week. It can be tempting at this time to increase the intake of snack foods and fast foods that are high in fat, sugar and salt increasing the risk for various health conditions like vascular diseases etc. The consumption of soft and sugary drinks is 34% which shows intake of the same is once per month. Table 17 represents consumption of sweets, cakes or chocolates to which 36% of the subjects agree consuming on daily basis, consumption of biscuits where 28% of the subjects agreed to consumption once a week. The data above suggest combined consumption of junk food which has a negative correlation to BMI and is a factor leading to obesity and unhealthy lifestyle.¹⁷ 78% of the subjects aren't aware about the health benefits of olive oil and consume regular oils instead. Olive oil has plenty of healthy factors which subjects should be made aware of and asked to consume at least on a weekly basis for a healthier lifestyle. It also prevents age related macular degeneration preventing causes of visual impairments in older adults.¹ 45% of the subjects perceive the habit of eating out of boredom which states that no meaning in current situation or lifestyle might increase the amount of meals in a day to seem distracted from the issues. Increased intake of junk or unhealthy food will give positive relation to weight gain hence increasing the effect on BMI.¹⁹ 53% of the subjects disagree to be skipping meals as it has no relation to weight loss or alteration in BMI.²⁰



Conclusion: According to the study conducted 28% of the subjects are underweight, 55% of the subjects have a normal BMI. 14% of the subjects are in overweight category and 3% of the subjects are in the obese category as per the WHO classification of BMI. The study results concluded presence of health awareness amongst the teenage subjects. And also represents that the subjects are concerned about their weight and tend to eat healthier and avoid inappropriate food with excessive calories.

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Tables:

1. Table 1: Represents age distribution of the subjects.

Age	No. of Samples
15 years	22
16 years	20
17 years	25
18 years	23
19 years	20

2. Table 2: Represents gender distribution of subjects.

Gender	No. of Samples
Male	44
Female	66

3. Table 3: Shows the classification of subjects according to BMI.

Categories of BMI	No. of samples
Underweight (below 18.5)	31
Normal (18.5-24.9)	61
Overweight (25-29.9)	15
Obese (30.0 and above)	3

4. Table 4: Shows the classification of subjects according to type of food they consume.

Type	No. of samples
Vegetarian	48
Non-vegetarian	50
Eggetarian	12



5. Table 5: Represents the consumption of water and sugar intake.

No. of Subjects	Yes	No
Consumption of Water	53	57
Consumption of Sugar	34	76

6. Table 6: Shows the number of meals consumed in a day.

No. of meals/ day	No. of samples
1-2 meals	17
3-4 meals	68
5-6 meals	24
More than 6 meals	1

7. Table 7: Represent the consumption of Milk and Milk products by the subjects.

Consumption of Milk and Milk products	No. of samples
Everyday	51
2-3 times a week	31
Once a week	14
Once in 15 days	5
None	9

8. Table 8: Represent the consumption of fruits and fruit juices by the subjects.

No. of Subjects	Everyday	Once in Two days	Once a week	None
Consumption of fruit	38	33	30	9
Consumption of fruit juices	6	17	57	30



9. Table 9: Represent the consumption of green vegetables and starch by the subjects.

No. of Subjects	Twice/day	Once/day	Once/two days	Once/week
Consumption of Green Vegetable	6	37	39	28
Consumption of Starch	15	48	33	14

10. Table 10: Represent the consumption of pulses in the subjects.

Consumption of Pulse	Twice/day	Once/day	Once/2 days	Once/week	Never
No. of Subjects	15	39	27	25	4

11. Table 11: Represent the consumption of meat/pork/ fish by the subjects.

Consumption of meat/pork/fish	Everyday	Once/ two days	Once/week	Once/15 days	Never
No. of Subjects	5	8	21	12	64

12. Table 12: Represent the consumption of soft drinks and junk food by the subjects.

No. of Subjects	Twice/week	Once/ week	Once/month	Never
Consumption of Soft drinks	27	33	37	13
Consumption of Junk food	59	40	9	2

13. Table 13: Represent the consumption of cakes and biscuits by the subjects.

No. of Subjects	Everyday	Once/2 days	Once/week	Once/15days	Never
Consumption of Cakes and sweets	40	27	20	17	6
Consumption of Biscuits	18	30	31	12	6



14. Table 14: Represent the consumption of type of oil by the subjects.

Type of oil	Olive Oil	Other Oil
No. of Subjects	24	86

15. Table 15: Shows the classification of subjects who eat out of boredom.

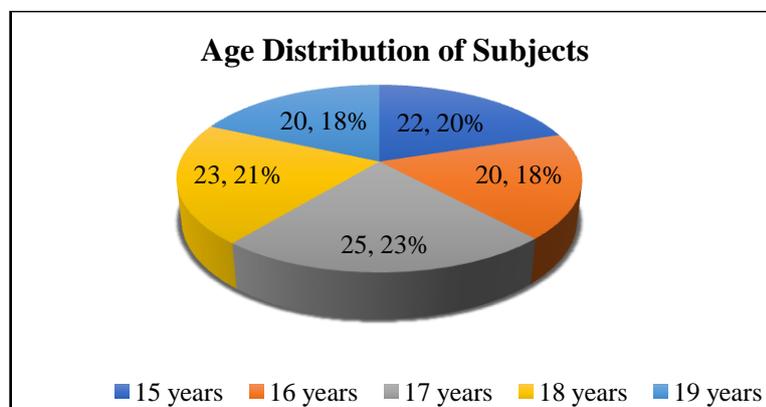
Eating out of Boredom	Yes	No	Sometimes
No. of Subjects	50	31	29

16. Table 16: Represent the skipping of meals of the subjects due to stress.

Skipping Meal	Yes	No
No. of Subjects	52	58

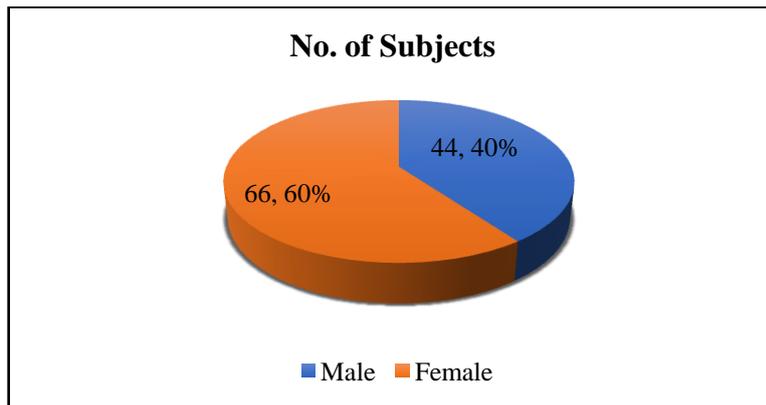
Graphs:

Graph 1: Represents age distribution of the subjects.

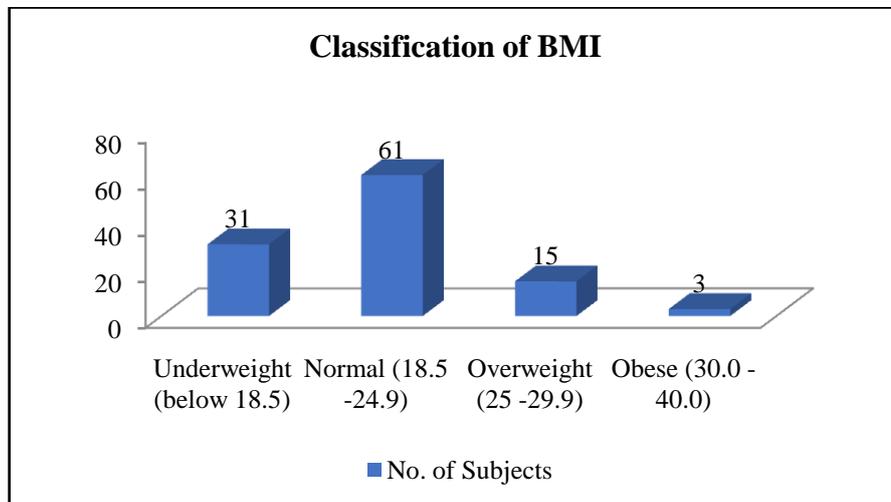




Graph 2:Represents gender distribution of subjects

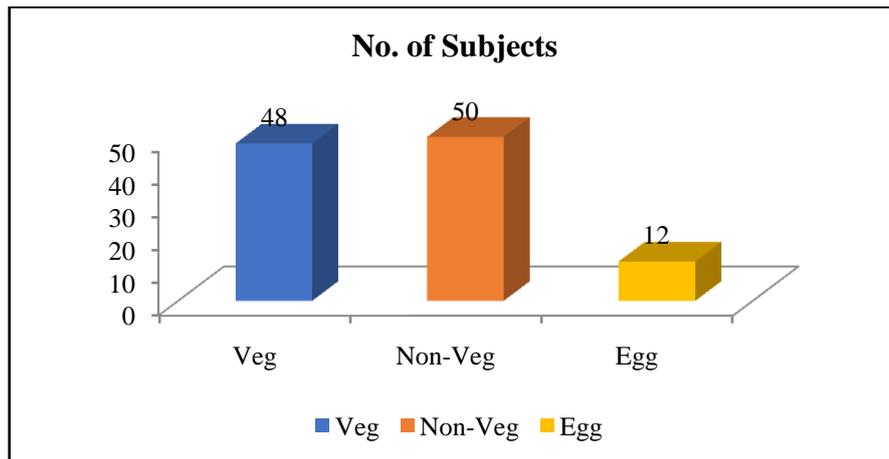


Graph 3:Shows the classification of subjects according to BMI

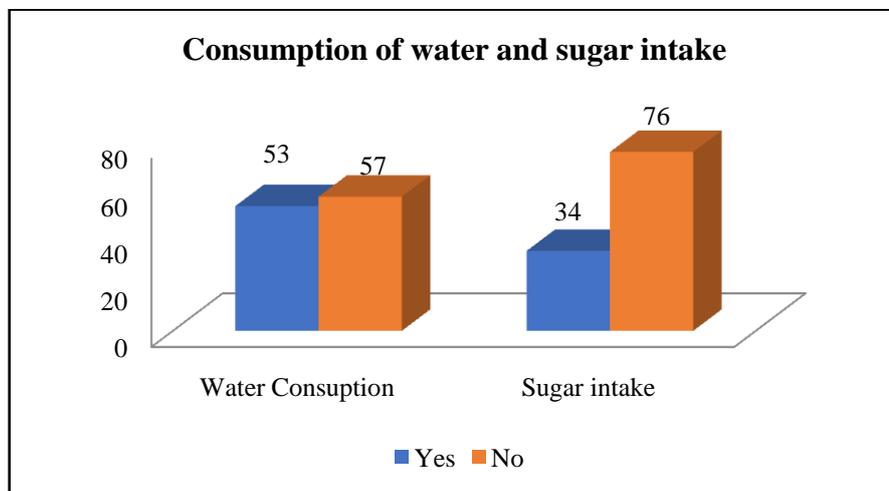




Graph 4: Shows the classification of subjects according to type of food they consume

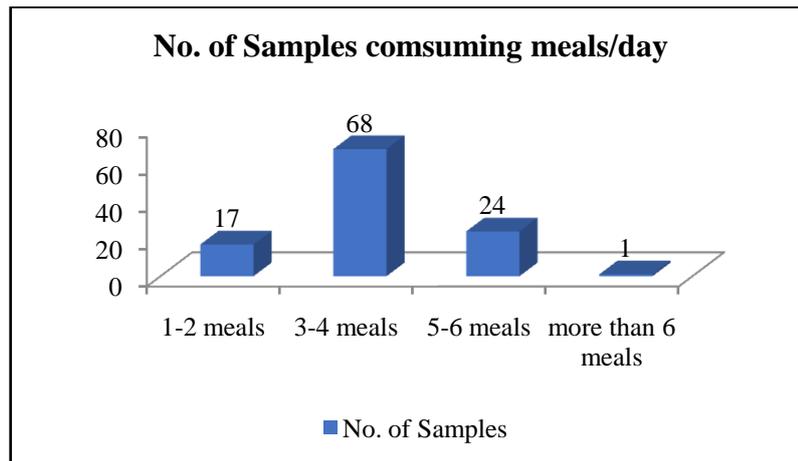


Graph 5: Represents the consumption of water and sugar intake.

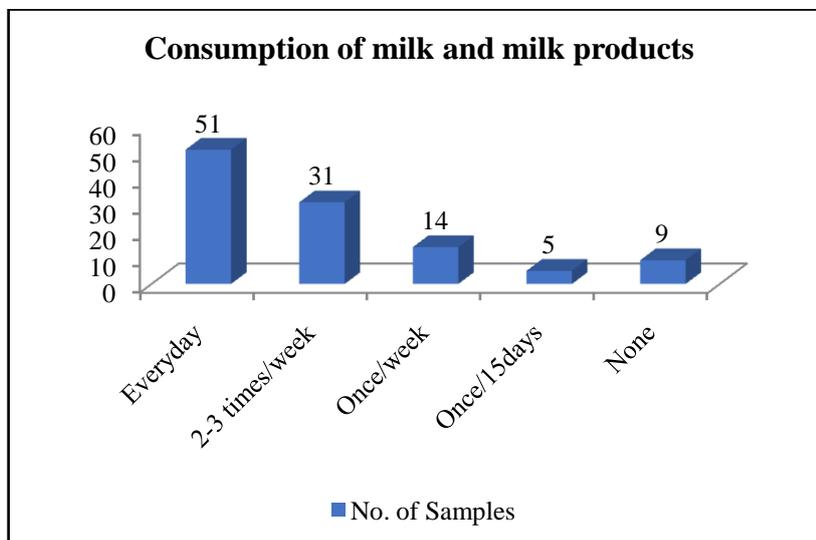




Graph 6: Shows the number of meals consumed in a day

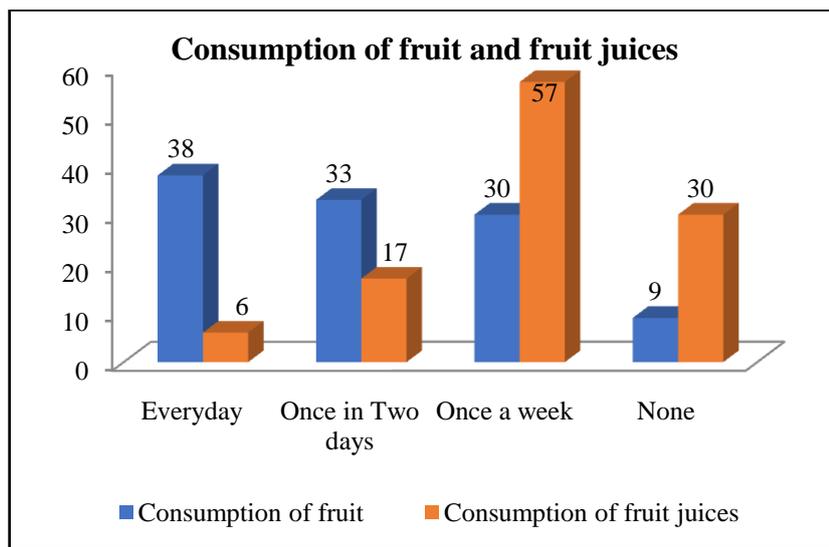


Graph 7: Represent the consumption of Milk and Milk products by the subjects

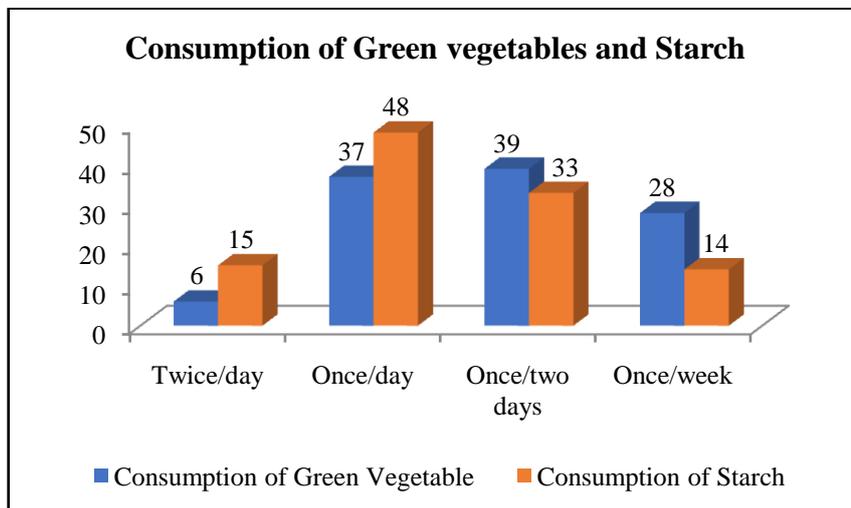




Graph 8: Represent the consumption of fruits and fruit juices by the subjects

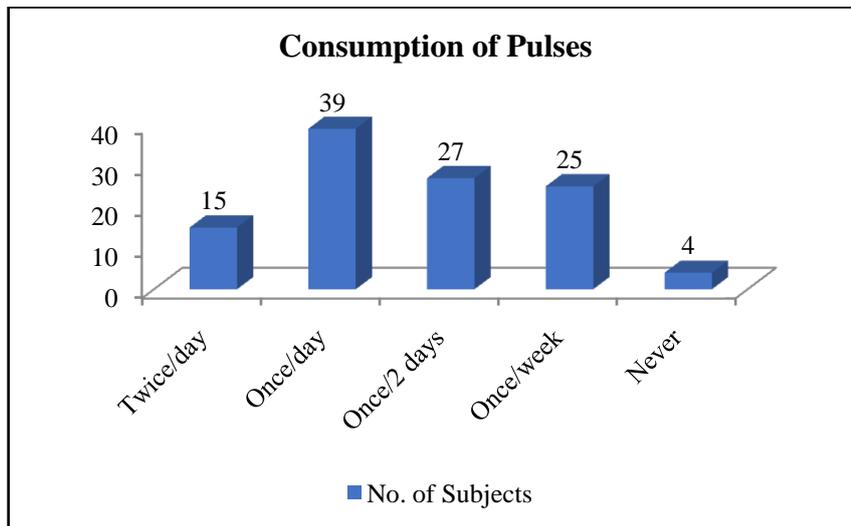


Graph 9: Represent the consumption of green vegetables and starch by the subjects

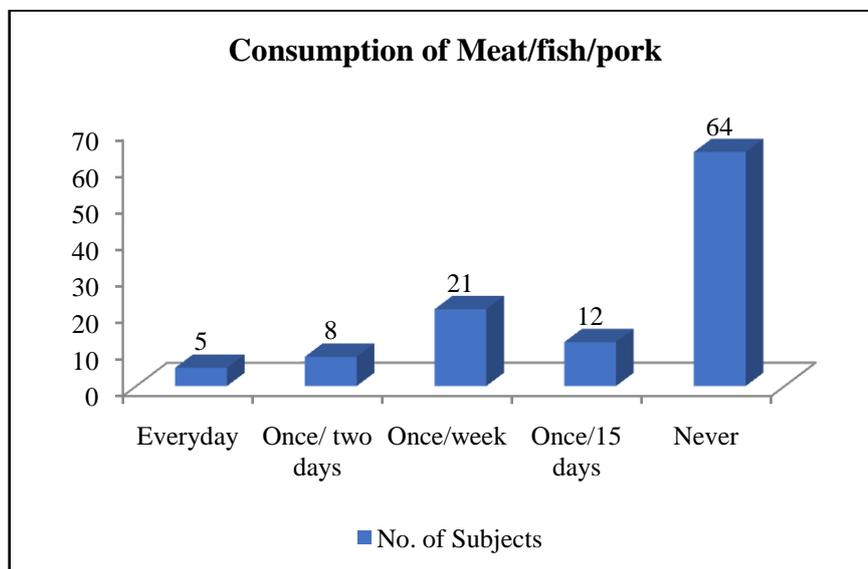




Graph 10: Represent the consumption of pulses in the subjects

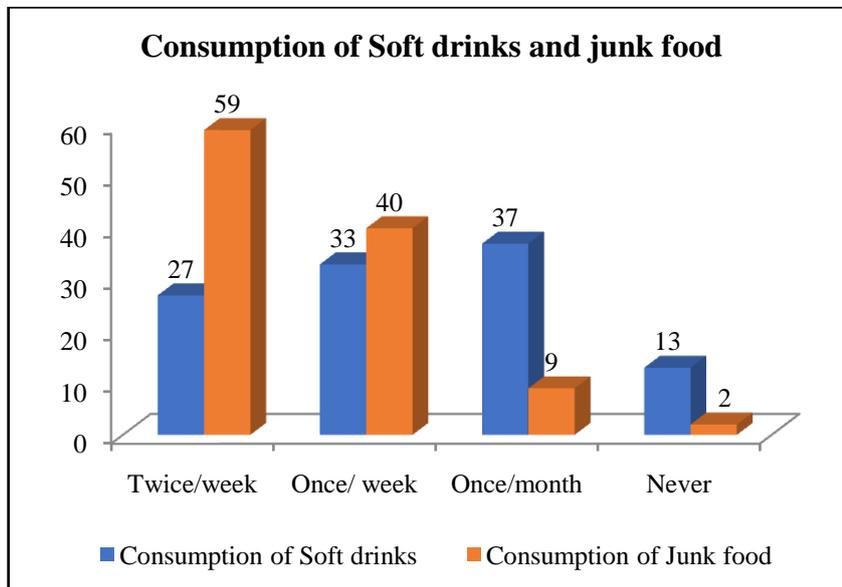


Graph 11: Represent the consumption of meat/pork/ fish by the subjects

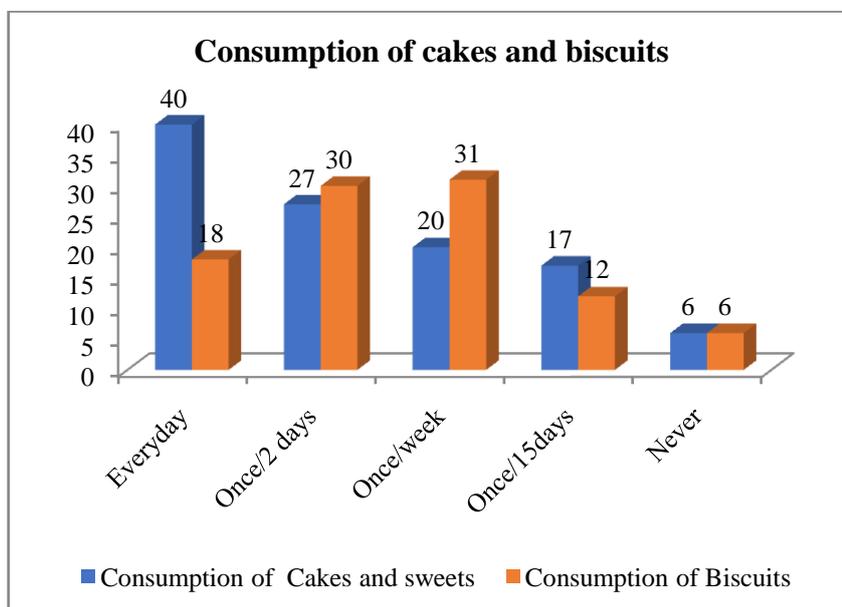




Graph 12: Represent the consumption of soft drinks and junk food by the subjects

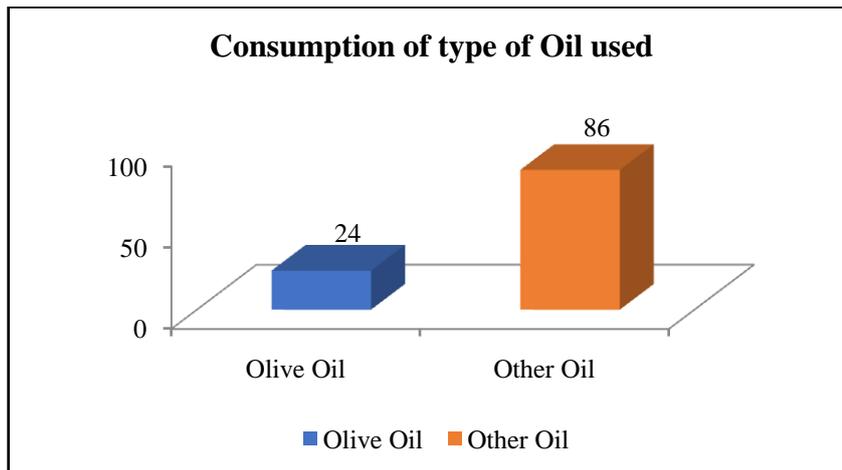


Graph 13: Represent the consumption of cakes and biscuits by the subjects

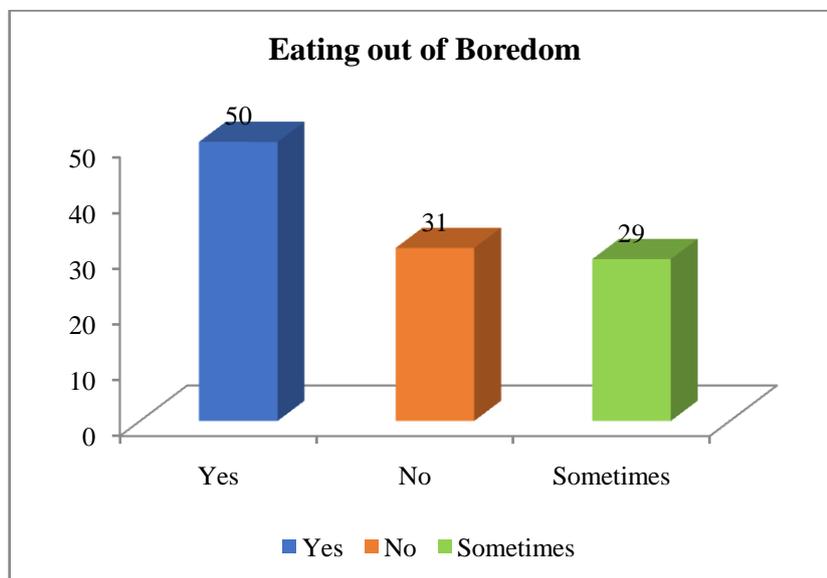




Graph 14: Represent the consumption of type of oil by the subjects

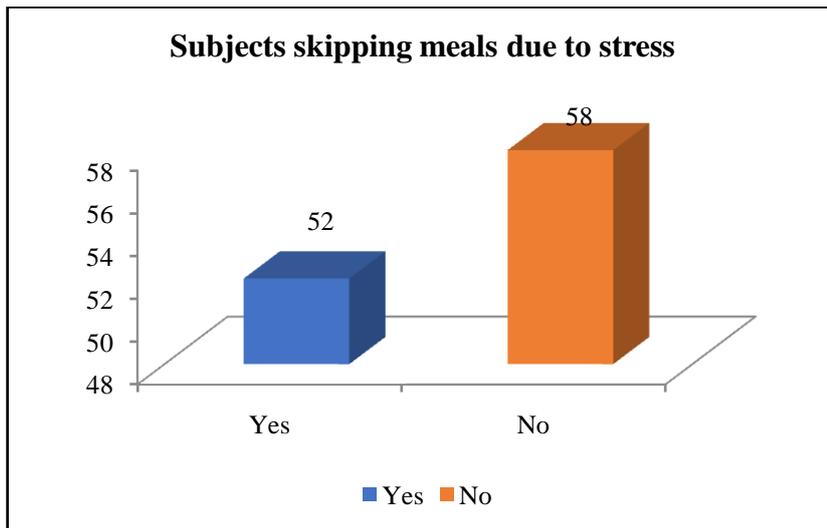


Graph 15: Shows the classification of subjects who eat out of boredom





Graph 16: Represent the skipping of meals of the subjects due to stress



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