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### EXPLORING CONSUMER PERCEPTIONS OF NUTRITIONAL SUPPLEMENTS FOR MALNUTRITION AND OBESITY

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#### ABSTRACT

Malnutrition and obesity are one of the most important causes for improper physical and mental development. The increasing prevalence of malnutrition and obesity has become a growing matter of public health concern worldwide. Nutritional supplements are the possible solution for combat the malnutrition and obesity. The aim of the current study was to explore how consumers perceive nutritional supplements as a possible solution for malnutrition and obesity. This population survey will gather information on consumer awareness, attitudes and usage patterns of nutritional supplements, as well as the factors that affect their decision to use them and the reason behind their disease condition. The current study is conducted on 145 people of 18 years old and above and performed from 24 August until 29 September. The questionnaire was designed for data collection. The results show that 17.2% of participants were malnourished, 28.3% of participants were obese and 54.5% of participants are normal. Amongst all 58.6% of participants eat a nutrient rich and balance diet to meet the nutritional goal and combat Malnutrition and Obesity.

#### KEYWORDS

Malnutrition, Obesity, Nutritional supplements, Questionnaire and Data collection.

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#### INTRODUCTION Nutritional Survey

A nutritional survey is a tool used to assess and monitor the nutritional status of a population or individuals by collecting data on dietary intake, anthropometric measurements and other relevant factors. Assessment of the status of populations health and nutrition is imperative to design and implement sound public health programs and health policies. The various extensive health and nutrition surveys provide information on different domains of

health. These provide vital information and statistics for the area where survey is done and the data generated are used to identify the prevalence and risk factors for the diseases and health challenges faced by that area<sup>1</sup>.

### **Malnutrition**

Malnutrition and Obesity are global health issues that impact all age group peoples.

Malnutrition is defined as deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients. The term malnutrition is divided into 3 broad groups of conditions:

Undernutrition includes wasting (less weight for height), stunting (less height for age) and underweight (less weight for age);

Micronutrient-related malnutrition includes micronutrient deficiencies (important vitamins and minerals deficiency) or micronutrient excess;

Overweight includes obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes and some cancers)<sup>2</sup>.

### **National context of malnutrition in India**

According to the Food and Agriculture Organization (FAO) report, near by 194.4 million people of India (14.5% of the total population) are undernourished.

According to UNICEF, India belongs to the 10<sup>th</sup> spot and 17<sup>th</sup> spot amongst countries with the highest number of underweight children and stunted children, respectively.

### **Obesity**

Obesity is defined as a pathological condition in which excess body fat is accumulated, causing adverse effects on health and life expectancy. It characterized by high cholesterol level, high fatty acid levels; metabolic energy imbalances; desensitization of insulin; lethargy, gallstones; high blood pressure; shortness of breath; emotional and social problems and excessive accumulation of adipose mass with hyperplasia and hypertrophy. Pathological obesity is associated with several secondary commodities like heart related diseases, type 2 diabetes, breathing difficulties during sleep, cancer and osteoarthritis<sup>3</sup>.

### **Prevalence of Obesity in India**

Obesity prevalence in India is 40.3%. Following are the zonal variations in India: 46.51% at south highest and 32.96% at east lowest. Obesity was higher among women as compared to men (41.88% vs. 38.67%), urban as compared to rural (44.17% vs. 36.08%) and over 40 as compared to under 40 (45.81% vs. 34.58%). More education leads to higher obesity (44.6% college vs. 38% uneducated), because of lowered physical activity (43.71% inactive vs. 32.56% vigorously active). The odds ratio for physical activity was 3.83, stronger than age (1.58), education (1.4), urban (1.3) and gender (1.2)<sup>4</sup>.

### **Nutritional Supplements**

Nutritional supplements are the products which improves the diet and often contain vitamins, minerals, herbs or amino acids. Nutritional supplements are often associated with CAM (Complementary and Alternative Medicine), which includes a group of diverse medical and health care systems, practices, and products that are not considered part of conventional medicine. The nutritional supplements consist the main types as herbal medicines, vitamins and minerals and homeopathic remedies. In recent years the use of nutritional supplements has gained in popularity among individuals with CLBP and these products are widely available in the United States. Nutritional supplements can be purchased from various sources, including retail stores such as pharmacies, health food stores, or grocery stores. Nutritional supplements also can be obtained directly from the health care providers who prescribe the uses of it.

### **Nutritional supplements that may help with malnutrition and obesity include**

#### **Multivitamins**

Reduces the risk of obesity in childrens and adolescents.

#### **Calcium and Vitamin D**

Improves the metabolic health, regulates the triglyceride storage and reduces the body weight.

## **Biotin**

Improves pancreatic  $\beta$ -cell function and regulates the transcription of the insulin receptor.

## **AIM OF THE SURVEY**

Aim of the current study was to determine the prevalence of malnutrition and obesity in different age groups in different districts.

This market research is conducted to explore how consumers perceive nutritional supplements as a possible solution for malnutrition and obesity.

This population survey will gather information on consumer awareness, attitudes and usage patterns of nutritional supplements, as well as the factors that affect their decision to use them.

The data collected will be used to develop effective nutritional supplement strategies and policies to combat Malnutrition and Obesity.

Nutritional assessment allows healthcare providers to systematically assess the overall nutritional status of patients, diagnose malnutrition and obesity, identify underlying pathologies that lead to malnutrition and obesity, and plan necessary interventions.

Provides factual evidence of the exact magnitude of nutritional problems, which is essential to sensitize administrators and politicians to obtain material allocation and human resources and plan appropriate intervention strategies.

## **METHODOLOGY**

The current study is a cross-sectional study which was conducted for assessing the nutritional status of people of 18 years old and above.

Survey has been performed from 24 August until 29 September 2024.

The statistical population included 18 and above year-old people residing in the cities and villages of Maharashtra.

With the help of Google form software, sample size was calculated. 145 people were determined.

In the Google form software questionnaire was prepared.

The questions were prepared with its multiple-choice answers for the people's ease of responding

to the questionnaire and time saving purpose for the participants.

The questionnaire was prepared in easy format, the language used in the questionnaire was simple and easy to understand for all, even for the less educated people. The images were added for the better understanding of people.

The Body Mass Index calculator also add in the questionnaire for the people who doesn't know their Body Mass Index.

## **The following information was collected for each individual**

Age and gender

Location of residence

Current Body Mass Index (BMI)

Nutritional state (Malnourished or Obese)

Disease state that affects the nutritional status.

Dietary restrictions and amount of daily intake of vitamins and minerals.

Weight change after consultation with healthcare provider.

The habits affects the nutritional status of person like smoking or alcohol.

Any additional factor that affected by being obese or malnourished.

Consumption of nutrition rich product to meet the daily nutritional goals and recover from being malnourished or Obese.

The summary of these information and the individual response of each participant in this survey are recorded.

The responses of the people are collected in the format of pie charts, holograms and graphs. These charts and graphs are used for analysis of data.

After the data analysis, the final report of survey is prepared.

## **RESULTS AND DISCUSSION**

The 145 respondents comprised 63 males and 82 females.

The results show that 17.2% of participants were malnourished, 28.3% of participants were obese and 54.5% of participants are normal.

Amongst the all 58.6% of participants eat a nutrient rich and balance diet to meet the nutritional goal and combat Malnutrition and Obesity.

### **Characteristics of the participants in the survey**

*n*= number of participants

43.4% of participants were male and 56.6% were women in this survey.

Maximum respondents were ranging between 18-29 age group.

### **The health condition of participants**

Amongst the all male and female participants 11.1% of male participants were Malnourished, 26.9% were Obese and 61.9% were normal. In female participants 8.5% were malnourished, 35.3% were Obese and 56.2% were normal.

As compared to male, females are more suffering from Obesity.

### **Body Mass Index of participants**

According to the BMI scale, amongst the all participants 11.7% were underweight, 60% of participants were normal, 13.1% of participants were overweight and 15.2% of participants were Obese.

### **Residential area of participants**

34.5% of urban population suffering from malnutrition or obesity and 38.8% of rural population were suffering from malnutrition and obesity. As compared to city, villagers were suffering in more extent from malnutrition or obesity.

### **Self – Care Practice**

We asked participants about the types of self-care practices they conduct.

The most popular self-care practices were 'consultation with a healthcare provider' and 'dietary restrictions'.

After consultation with a healthcare provider 17.9% of participants were gained their weight, 22.8% of participants were loosed their weight and 59.3% of participants weight has not changed.

Weight gain for malnourished people and weight loss for obese persons are the most essential primary treatment method. By the consultation with healthcare provider, patients suffering from

malnutrition and obesity can gain or lose weight respectively.

15.2% of participants were follow the dietary restrictions, 0.7 % of participants were unsure and 84.1% of participants do not follow dietary restrictions.

### **Factors affected by being Obese or Malnutrition**

According to the survey 1.4% of participants consumes tobacco or alcohol, 4.8% of participants consumes sometimes and 93.8% of participants not consume alcohol or tobacco. (These results influenced by hesitation of people of accepting the habit, that's why these results can't be used for reference or study).

21.4% of participants possesses additional factor that's affected by being Malnourished or Obese. (Additional factor includes health condition or any bad habit etc).

### **Consumer's perception about Nutritional supplements**

49.7% of participants consumes nutrition rich product to meet the daily nutritional goals and recover from being malnutrition and obesity, 15.2% of participants were unsure about their nutritional intake and 35.2% of participants were not consume nutrition rich product to meet the daily nutritional goals or for combat Malnutrition and Obesity.

The number of participants who doesn't consume nutrition rich product is less than the number of participants who consumes nutrition rich product to meet the nutritional goal and combat Malnutrition and Obesity.

### **Daily intake of vitamins and minerals**

Amongst all participants, 40.7% of participants had a daily intake of vitamins and minerals, 27.6% of participants not be sure and 31.7% of participants does not contain daily intake of vitamins and minerals in their diet.

Number of participants who take daily nutrients like vitamins and minerals are greater than the number of participants who doesn't take daily intake of vitamins and minerals.

**Obesity**

S.No	BMI	Classification
1	<18.5	Underweight
2	18.5-24.9	Normal weight
3	25.0-29.9	Overweight
4	30.0-34.9	Class 1 obesity (obese)
5	35.0-39.9	Class 2 obesity (severe obese)
6	≥40.0	Class 3 obesity (morbid obesity)
7	≥40-50	Super obese

**Table No.1: Characteristics of respondents**

S.No		<i>n</i>	%
	<b>Sex</b>		
1	Male	63	43.4%
2	Female	82	56.6%
	<b>Age (years)</b>		
3	18-29	115	80.4%
4	30-39	15	10.5%
5	40-49	11	7.7%
6	50+ and above all	2	1.4%
7	Total	145	-

**Table No.2: The health condition of participants**

S.No		Male	%	Female	%
1	Malnourished	7	11.1%	7	8.5%
2	Obese	17	26.9%	29	35.3%
3	Normal	39	61.9%	46	56.2%

**Table No.3: Body Mass Index of participants**

S.No	BMI	<i>n</i>	%
1	<18.5 (underweight)	17	11.7%
2	18.5-24.9 (normal)	87	60%
3	25-29.9 (overweight)	19	13.1%
4	>30 (obese)	22	15.2%

**Table No.4: Residential area of participants**

S.No	Area	Total number of participants	Number of malnourished or obese amongst them	%
1	City	55	19	34.5%
2	Village	90	35	38.8%

**Table No.5: Participants experience after consultation with a healthcare provider**

S.No	Participants experience after consultation with a healthcare provider	<i>n</i>	%
1	Weight gained	26	17.9%
2	Weight loosed	33	22.8%
3	Weight has not changed	86	59.3%

**Table No.6: Dietary restrictions followed by participants or not**

S.No	Dietary restrictions	<i>n</i>	%
1	Yes	22	15.2%
2	No	122	84.1%
3	Unsure	1	0.7%

**Table No.7: Tobacco or alcohol consumption**

S.No	Alcohol or tobacco	<i>n</i>	%
1	Yes	7	1.4%
2	No	136	93.8%
3	Sometimes	2	4.8%

**Table No.8: Additional factor that's affected by being Malnourished or Obese**

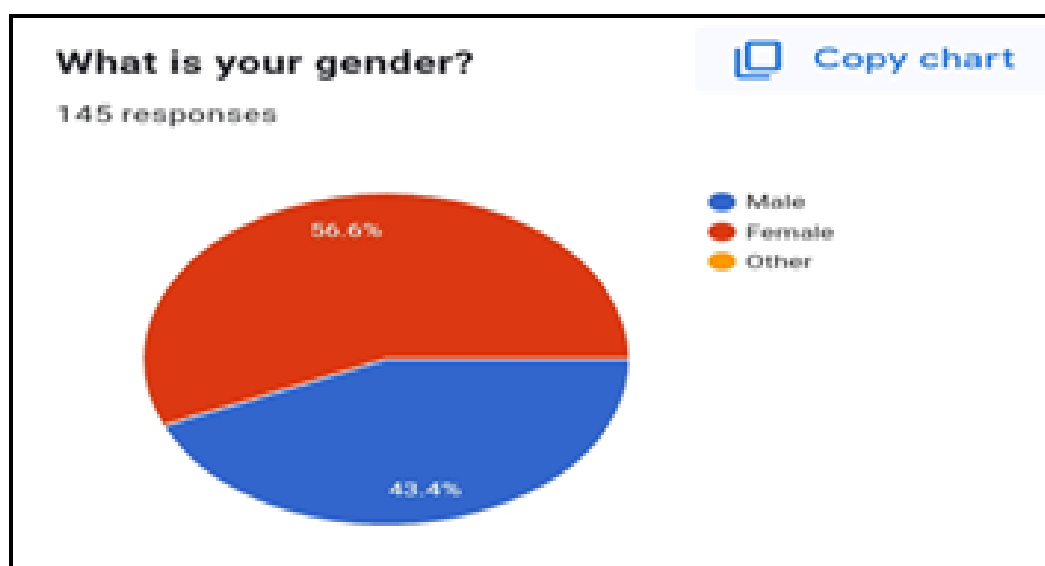
S.No	Any additional factor	<i>n</i>	%
1	Yes	7	4.8%
2	No	114	78.6%
3	Maybe	24	16.6%

**Table No.9: Consumption of nutrient rich product to combat Malnutrition and Obesity**

S.No	Participants consume nutrition rich product or not	<i>n</i>	%
1	Yes	72	49.7%
2	No	51	35.2%
3	Unsure	22	15.2%

**Table No.10: Daily intake of vitamins and minerals**

S.No	Daily intake of vitamins and minerals	<i>n</i>	%
1	Yes	59	40.7%
2	No	46	31.7%
3	Maybe	40	27.6%



**Figure No.1: Gender of participants**

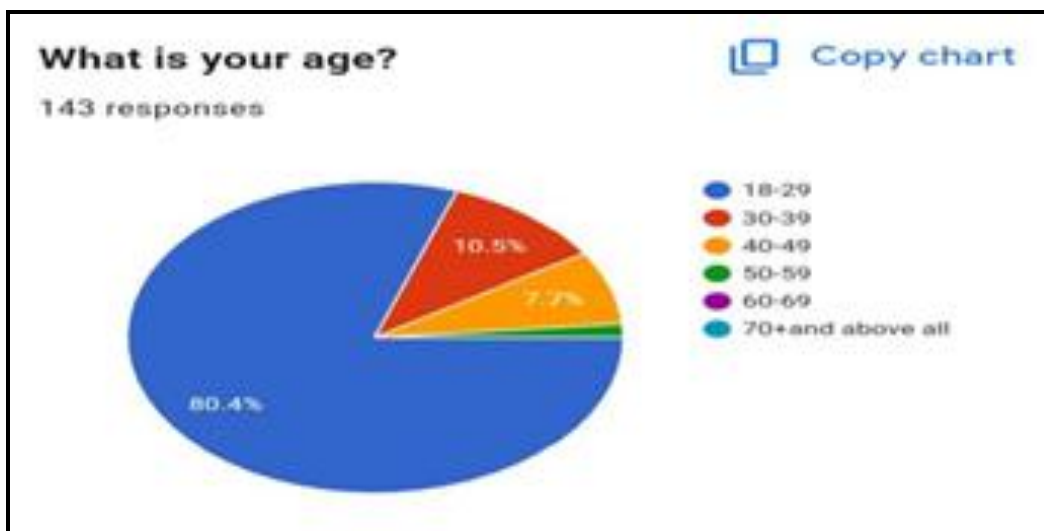


Figure No.2: Age of participants

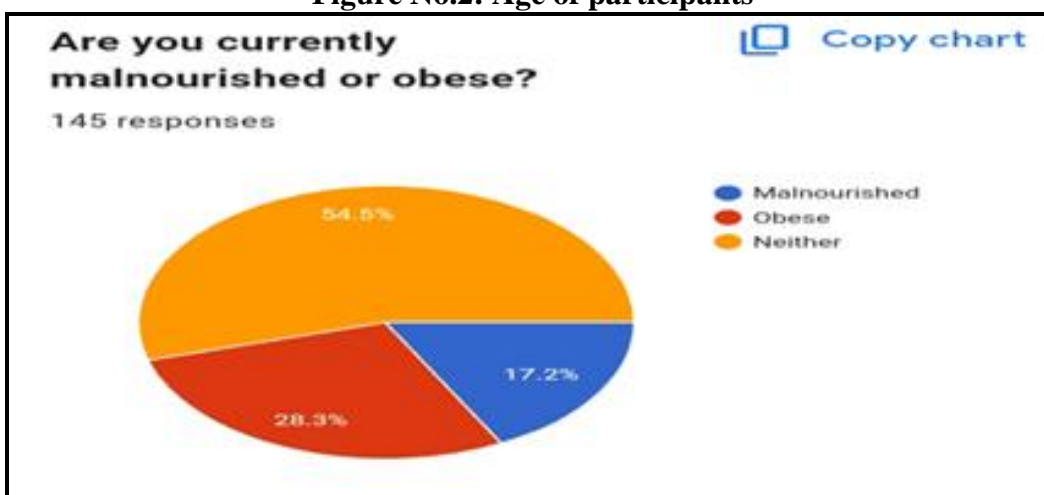


Figure No.3: Total percentage of male and female participants suffering from malnutrition and obesity



Figure No.4: Body mass index of participants

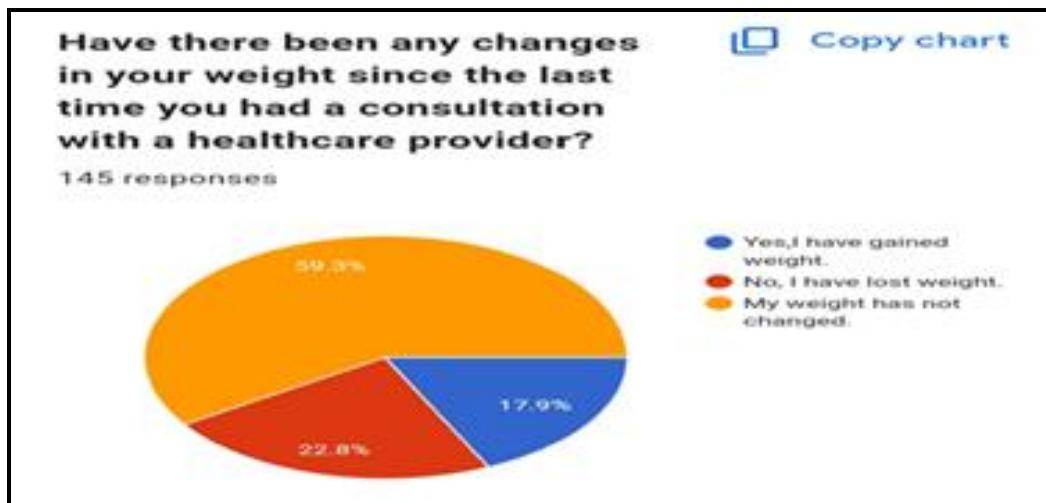


Figure No.5: Experience of respondents after consultation with a healthcare provider

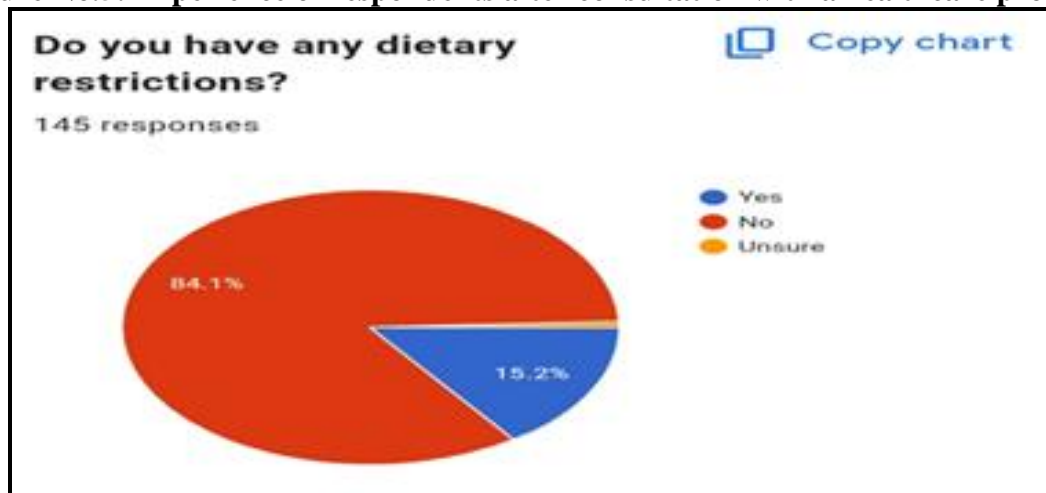


Figure No.6: Dietary restrictions followed by participants or not

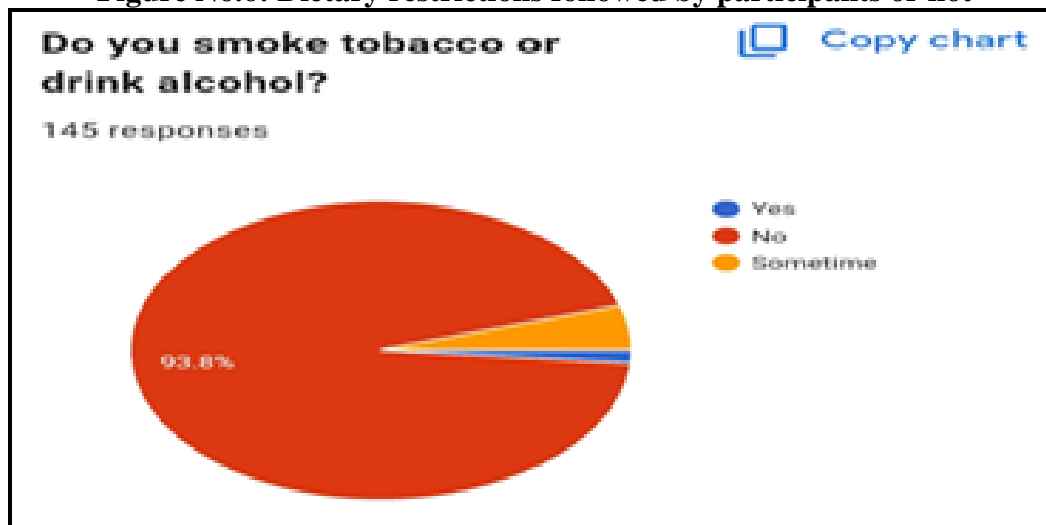


Figure No.7: Tobacco and alcohol consumption

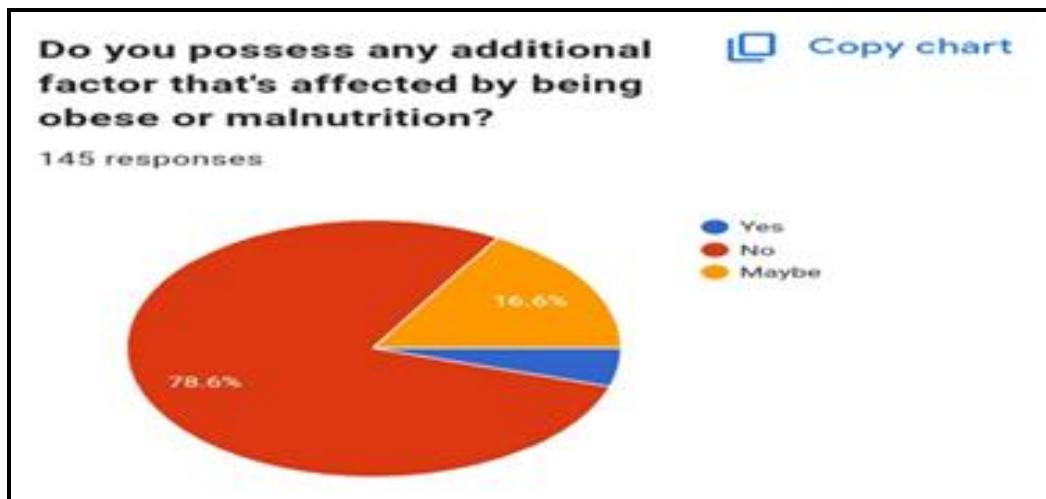


Figure No.8: Additional factors that's affected by being malnourished or obese

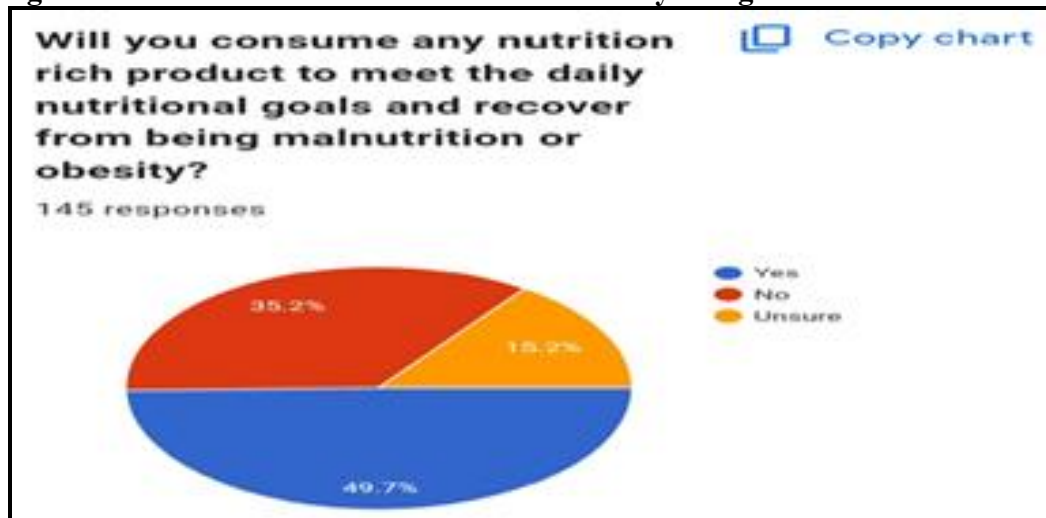


Figure No.9: Consumption of nutrient rich product to combat malnutrition and obesity

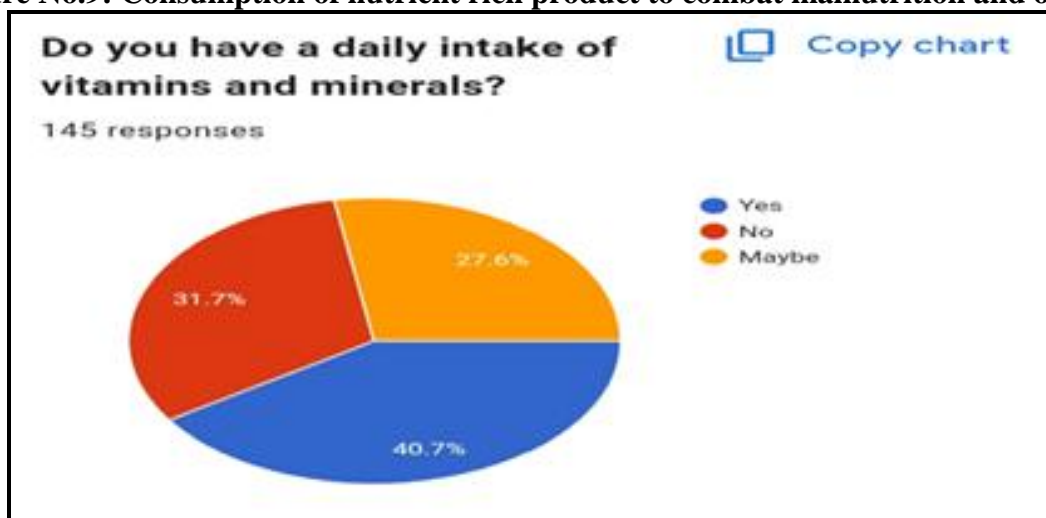


Figure No.10: Daily intake of vitamins and minerals

## CONCLUSION

**After the Study on 145 respondents comprised 63 males and 82 females following conclusions are obtained**

The results show that 17.2% of participants were malnourished, 28.3% of participants were obese and 54.5% of participants are normal. 34.5% of urban population suffering from malnutrition or obesity and 38.8% of rural population were suffering from malnutrition and obesity. As compared to city, villagers were suffering in more extent from malnutrition or obesity. Amongst all participants, 21.4% of participants were possesses additional factor that's affected by being Obese or Malnutrition. 49.7% of participants consumes nutrition rich product to meet the daily nutritional goals and recover from being malnutrition and obesity, 15.2% of participants were unsure about their nutritional intake and 35.2% of participants were not consume nutrition rich product to meet the daily nutritional goals or for combat Malnutrition and Obesity.

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## CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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