

AWARENESS ON IMPORTANCE OF IMMUNE BOOSTING DIET AMONG DENTAL STUDENTS- A SURVEY

Running Title: Awareness on Immune boosting diet among dental students

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ABSTRACT:

Introduction: A well-functioning immune system is essential for survival. The immune system must be always alert and must be monitoring for any signs of invasion or danger. It plays a vital role in protecting the body against diseases, fighting against foreign bodies and does a remarkable job in defending against microorganisms. A Natural immune booster is an additional immunising agent which helps to increase and sustain the immune response of the body. The aim of this study is to evaluate the awareness on importance of immune boosting diet among dental students

Materials and methods: A questionnaire of a total 14 questions were prepared and was uploaded through an online survey link. The responses were collected and then interpreted as bar graphs. A total of 100 undergraduate dental students have taken the survey. The data was analysed by IBM SPSS software where descriptive statistics and chi square test was done, where the results are plotted as graphs.

Results: A total of 100 participants have taken the survey in which 50% were males and 50% were females. A question was asked whether food directly affects our health in which 96% have answered yes. In another question pertaining to how many meals you eat per day. 48% have answered three times and 48% have answered two times. 98% believe that skipping meals affects our immunity/health. 94% believe that Indian spices can boost our immunity. 92% believe green tea is a great antioxidant. 57% have answered that taking natural food along with supplements can boost immunity instead of just taking either one. 48% answered that fat has more calories followed by

carbohydrates. 88% believe that Consumption of carbohydrates can lead to increase in triglycerides. 97% believe that consumption of citrus fruits can increase immunity

Conclusion: According to the study, students are aware about the nutrition which is required for maintaining and improving their immunity. As a budding doctor, the students should be aware about the nutrition which is required for maintaining immunity especially during this COVID 19 pandemic.

Keywords: immunity, diet, diseases, natural immune booster, Indian Spices, Innovative technology, Novel method

INTRODUCTION:

The main functions of the body's immune system is to protect the body against diseases caused due to microorganisms, to clear and heal the damaged tissues, and also provides constant watch of malignant cells within the body. The immune system also develops required tolerance to avoid any unwanted response to healthy tissues of self or harmless foreign substances.

The immune system has two different types of immunity defences. Innate immunity is the first line of defense against an infection. It is based on an antigen-independent defense mechanism that is used by the host immediately or within hours (depending on the pathogen) of encountering an antigen. The innate immune response has no immunologic memory which might be unable to recognize antigen if the same antigen attacks the host again in the future. Adaptive immunity is antigen-dependent and involves a lag time between exposure to the antigen and maximal response. Unlike innate immunity, adaptive immunity can memorize the antigen attacking the host which enables the host to produce a more rapid and efficient immune response upon subsequent exposure to the antigen(1–4).

The primary function of innate immunity is the recruitment of immune cells to sites of infection and inflammation through the production of cytokines which are small proteins involved in cell to cell communication. Numerous cells are involved in the innate immune response such as phagocytes (macrophages and neutrophils), dendritic cells, mast cells, basophils, eosinophils and natural killer (NK) cells . Phagocytes are further divided into two main cell types: neutrophils and macrophages. Both these cells have a similar function which engulfs the (phagocytose) microbes. In addition to their phagocytic properties, neutrophils contain granules that, when released, assist in the elimination of pathogenic microbes. Unlike neutrophils (which are short-lived cells), macrophages are long-lived cells that not only play a role in phagocytosis, but are also involved in antigen presentation to T cells whereas Adaptive immunity develops when innate immunity is ineffective in eliminating infectious agents and the infection is established. The cells of the adaptive immune system include: T cells, which are activated through the action of antigen presenting cells (APCs), and B cells. T cells are broadly classified into the cytotoxic T cells which bears the CD8 receptor, which are involved in direct killing of infected damaged cells and tumour cells, and the T helper cells which bear the CD4 receptor and is important in coordinating the responses of other immune cells and there is T regulatory cells (Treg), which are CD4-bearing T cells which is vital in maintaining immune tolerance to allow the immune system to ignore non-harmful non-self such as food, pollen, and environmental antigens such as latex (5,6).

Proper nutrition can boost our immune system which can support the functions of immune cells allowing them to initiate effective responses against pathogens but also to resolve the response rapidly when necessary and to avoid any underlying chronic inflammation. A Natural immune booster is an additional immunising agent which helps to increase and sustain the immune response of the body. Examples include Circumin is an active compound in turmeric which is a natural antioxidant which is used as an immune booster, antimicrobial, anti-pathogen and as a detoxifying agent(7).Our team has extensive knowledge and research experience that has translate into high quality publications (8),(9),(10),(11),(12),(13),(14),(15),(16),(17),(18),(19),(20),(21),(22),(23),(24),(25),(26),(27)

The aim of this study is to evaluate the awareness on the importance of immune boosting diet among dental students.

MATERIALS AND METHOD:

An online questionnaire based survey was conducted among the dental undergraduate students of Saveetha Dental College, to evaluate their knowledge on the importance of immune boosting diet. The participants did the survey voluntarily. The survey instrument which was a validated questionnaire was prepared after extensive review of the existing literature. The questionnaire consisted of 14 questions. The questionnaire was shared to the participants using online survey platform to get maximum responses. Only completed surveys were taken for analysis and the incomplete ones were eliminated. The statistical test used was descriptive statistics. All the responses obtained were tabulated. The statistics were done using SPSS software. Chi-square test with a p value of 0.05 set as statistically significant.

RESULTS AND DISCUSSION:

A total of 100 participants have taken the survey in which 50% were males and 50% were females(fig-1). A question was asked whether food directly affects our health in which 96% have answered yes(fig-2). In another question pertaining to how many meals you eat per day. 48% have answered three times and 48% have answered two times (fig-3). 98% believe that skipping meals affects our immunity/health(fig-4). 94% believe that Indian spices can boost our immunity(fig-5). 92% believe green tea is a great antioxidant(fig-6). 57% have answered that taking natural food along with supplements can boost immunity instead of just taking either one(fig-7). 48% answered that fat has more calories followed by carbohydrates(43%)(fig-8). 88% believe that Consumption of carbohydrates can lead to increase in triglycerides(fig-9). 97% believe that consumption of citrus fruits can increase immunity(fig-10). Chi square test was done between gender and boosting immunity which showed $p < 0.05$ which was statistically significant(fig-11).

Modern diet which is junk food which simply means an empty calorie food. An empty calorie food is a high calorie or calorie rich food which lacks in micronutrients such as carbohydrates, proteins, vitamins, minerals, or amino acids, and fiber but has high energy (calories). These foods do not contain the nutrients that your body needs to stay healthy. Hence, this food is considered unhealthy and is called as junk food(28–30)

People tend to skip meals due to so many reasons such as stress, weight loss etc. skipping a meal can affect the diet quality of a person which leads to greater intake of energy at subsequent meals.(31,32)

Turmeric provides instant relief from cough and cold, respiratory problems such as sinus and upper respiratory problems such as bronchial asthma and is proven to be an excellent immunity booster. Black pepper is also an excellent immunity booster as it has antioxidants, antimicrobial, and gastro-protective properties. Cinnamon is an aromatic spice that has antibacterial, antiviral, and antifungal properties that helps in dealing with infections and respiratory problems. Clove is an anti-inflammatory and antibacterial with high amounts of eugenol which can help in dealing with infections, helps in giving relief from coughing and reduces the throat pain, It is also an excellent remedy to treat oral hygiene. Fenugreek is a herb that acts as a natural anti-oxidant and strengthens the immune system. Cumin seeds work as antioxidants and help in fighting with the free radicals keeping the body healthy and glowing from inside. It helps in maintaining blood sugar, fights bacteria and has an anti-inflammatory, antiseptic effect which helps in reducing the pain. Cardamom decreases the cold and cough and helps in relieving from certain respiratory problems (33–35). Previous studies have shown that people were aware about the use of spices and how it can increase our immunity(36,37)

Studies have shown that increased consumption of carbohydrates can lead to an increase in the level of triglycerides, Triglycerides are lipids that give your body energy. Your body makes triglycerides and also gets it from the foods you eat, so increased

consumption of calories can cause an increase in triglycerides which can increase the chance of heart problems.(38,39)

Limitations of the study include short sample size and a unicentred study.

CONCLUSION:

From the results based on the survey we can say that the students were aware about the importance of an immune boosting diet and how it can affect our immunity. But it has to be seen how many of them actually follow this diet. People have to especially now due to the ongoing pandemic and the only thing which can protect us from this pandemic is having a good diet which can improve our immune system.

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Conflict of interest: The authors declare that there are no conflicts of interest in the present study.

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Ethical Clearance: Not Required

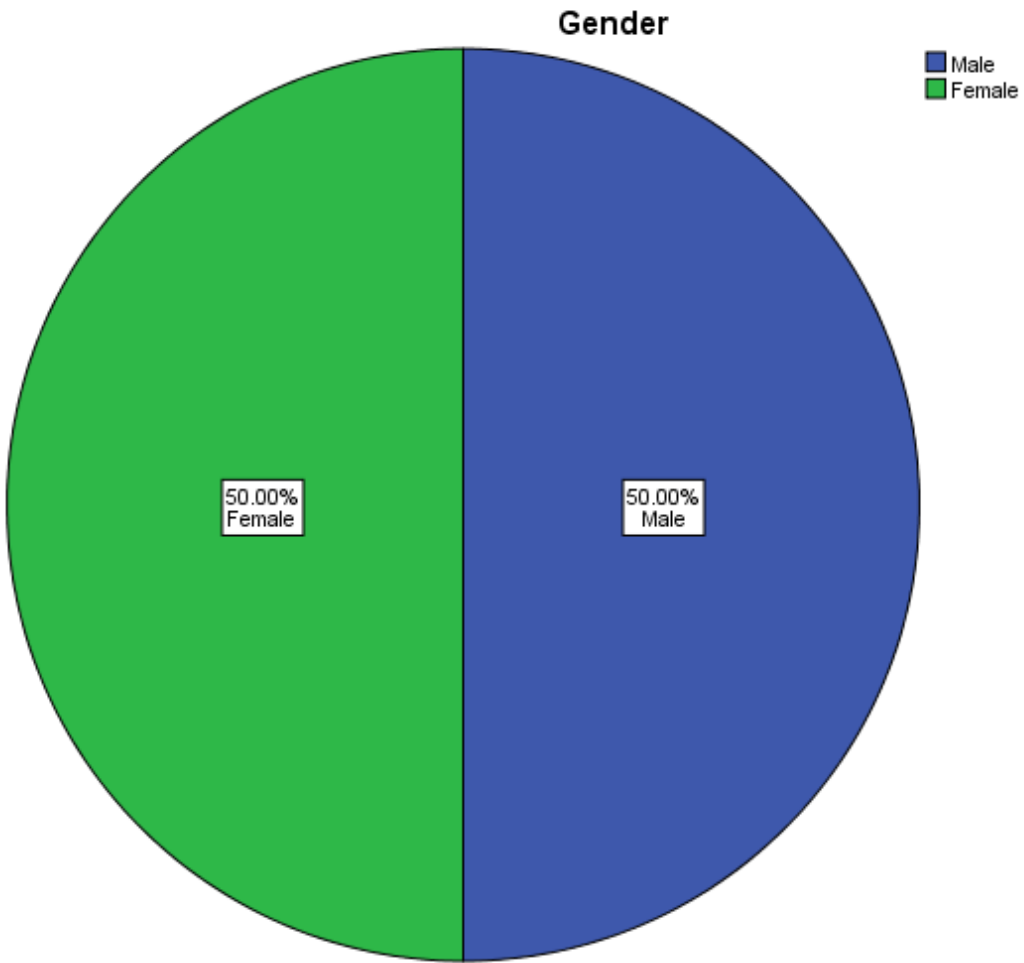


Figure-1: Pie chart showing the distribution of responses based on gender. Male-50%(blue), Female-50%(green)

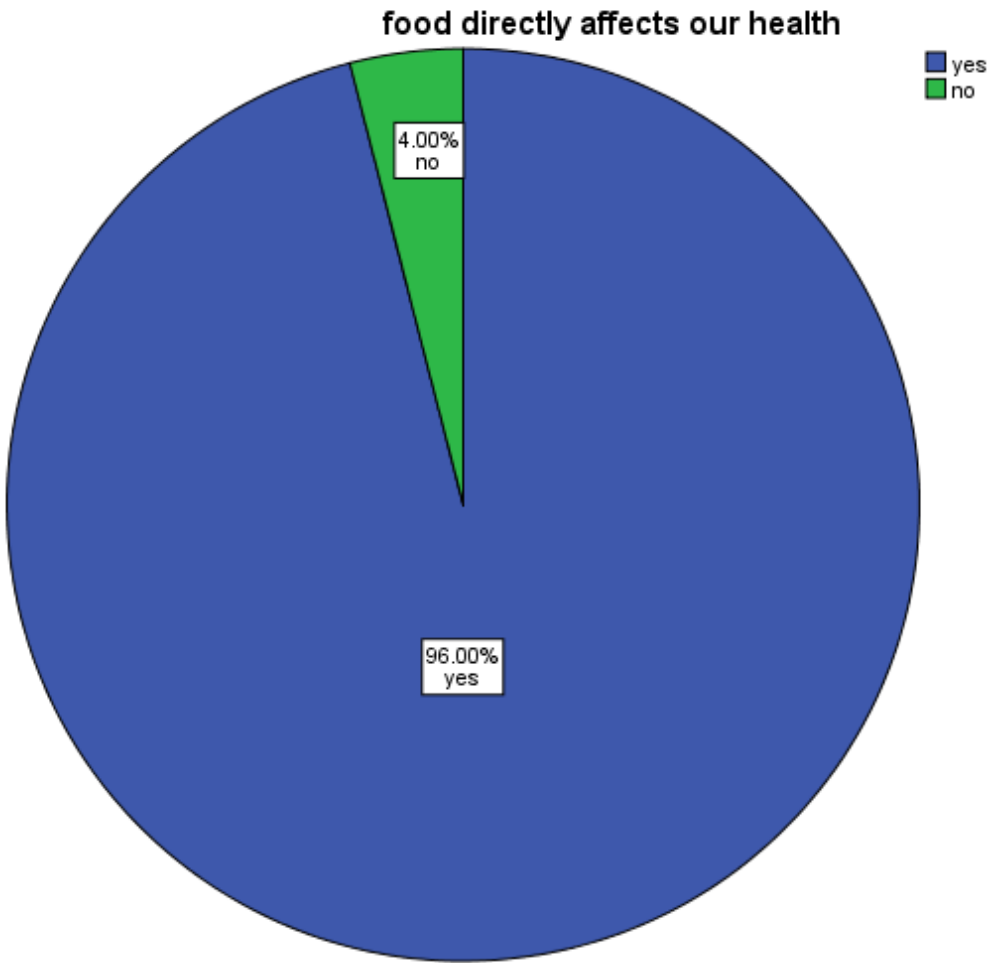


Figure-2: Pie chart shows distribution of responses based on the question “ does food directly affects our health” with yes being the most answered option-96%(blue) followed by no-4%(green)

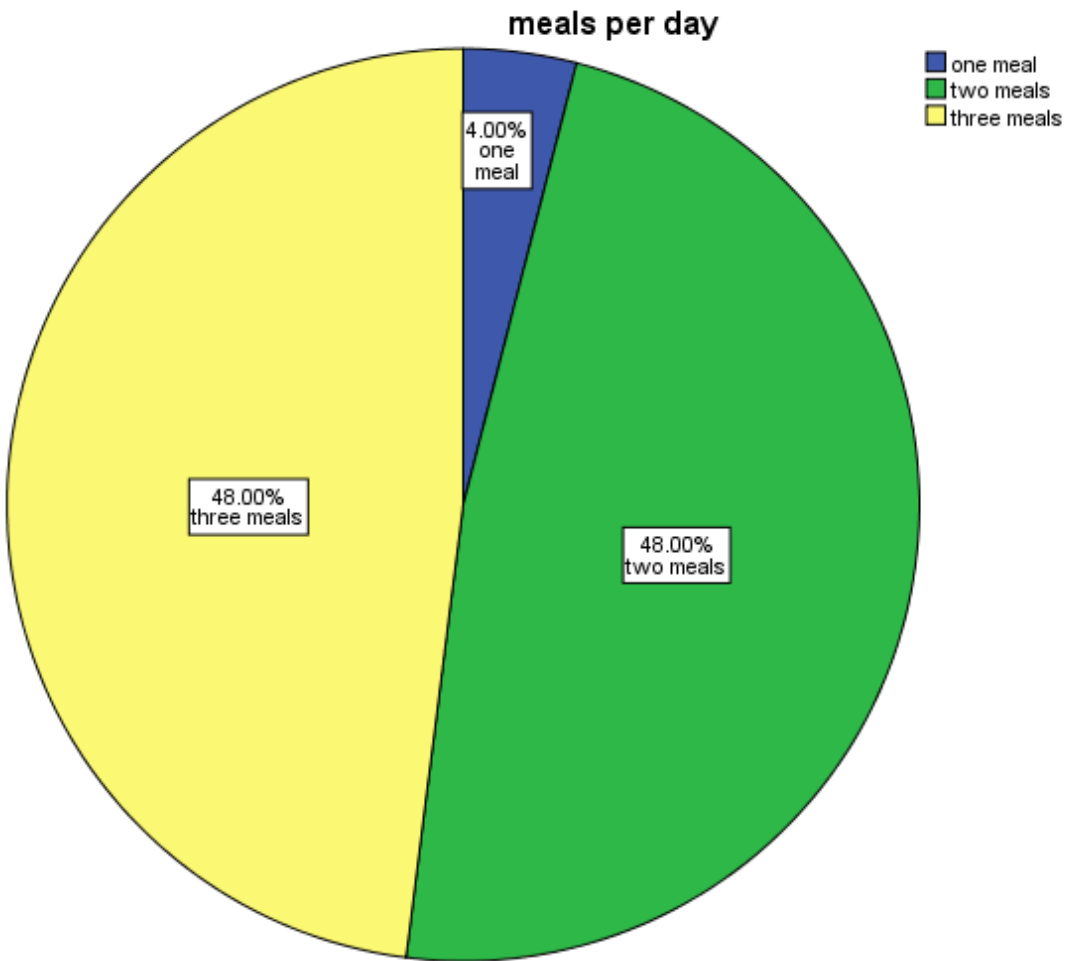


Figure-3: Pie chart shows distribution of responses based on the question “ how many meals do you eat per day” with two meals(green) and three meals(yellow) being the most answered option-48%(blue) followed by one meal-4%(blue)

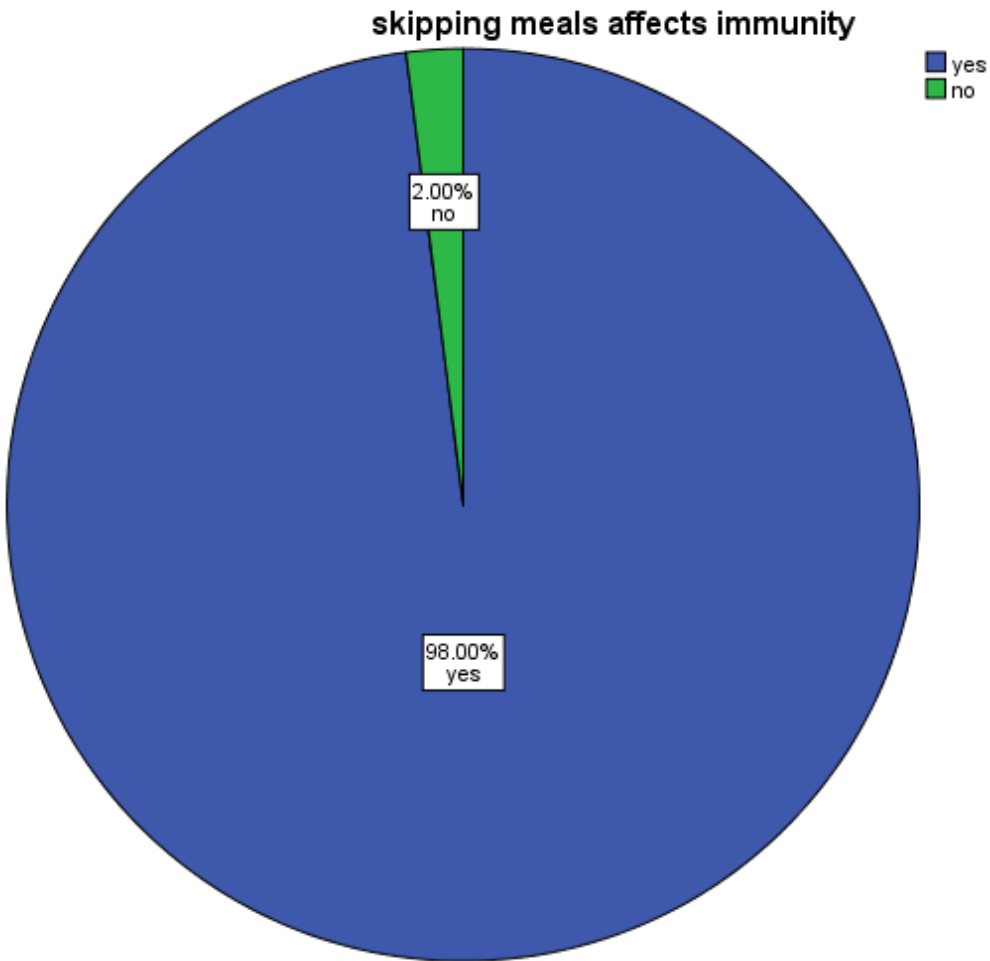


Figure-4: Pie chart shows distribution of responses based on the question “ does skipping meals affect our immunity/health” with yes being the most answered option- 98%(blue) followed by no-2%(green)

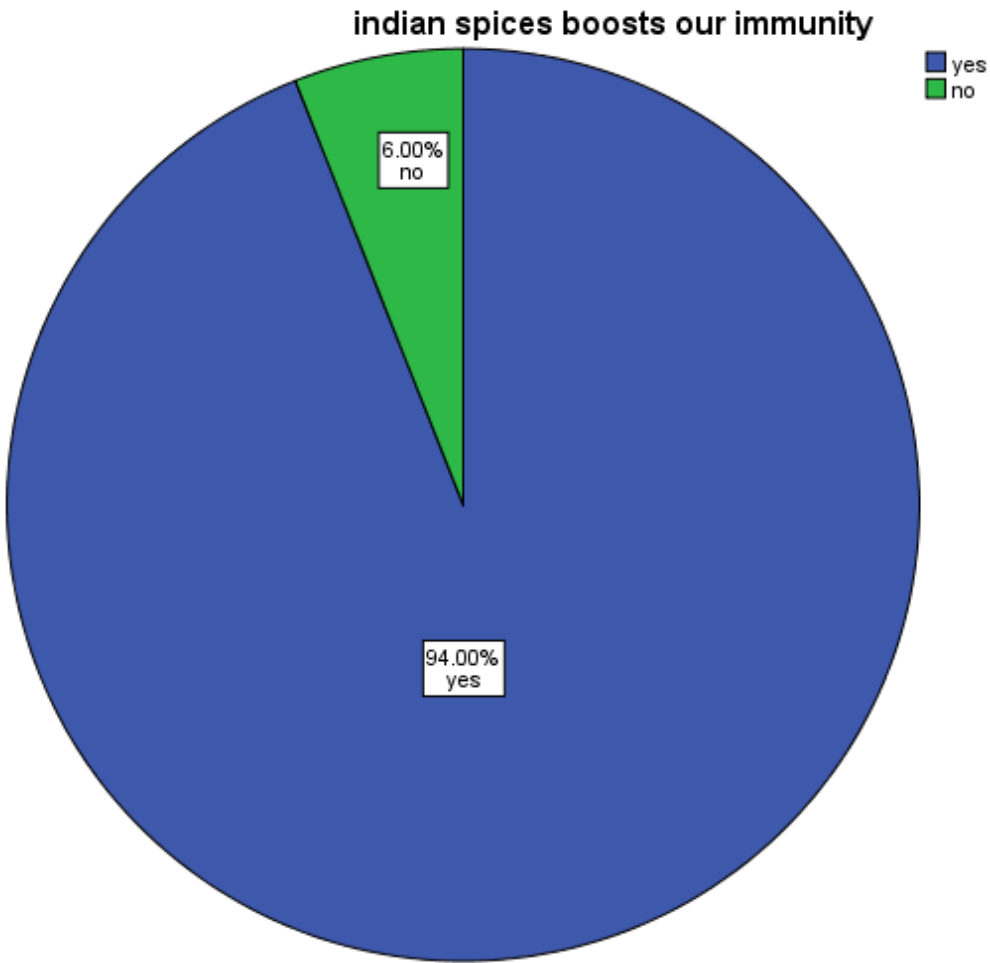


Figure-5: Pie chart shows distribution of responses based on the question“ doesindian spices boost our immunity” with yes being the most answered option-94%(blue) followed by no-6%(green)

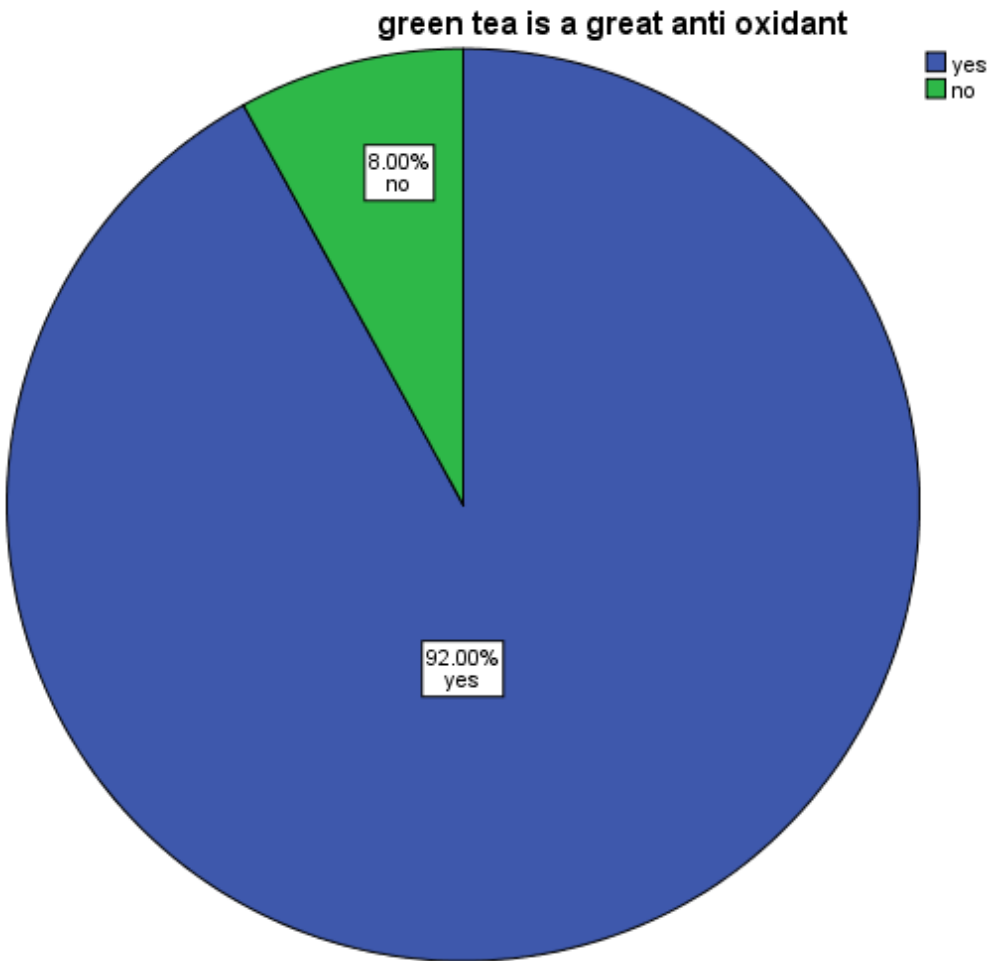


Figure-6: Pie chart shows distribution of responses based on the question “ is green tea a great antioxidant” with yes being the most answered option-92%(blue) followed by no-8%(green)

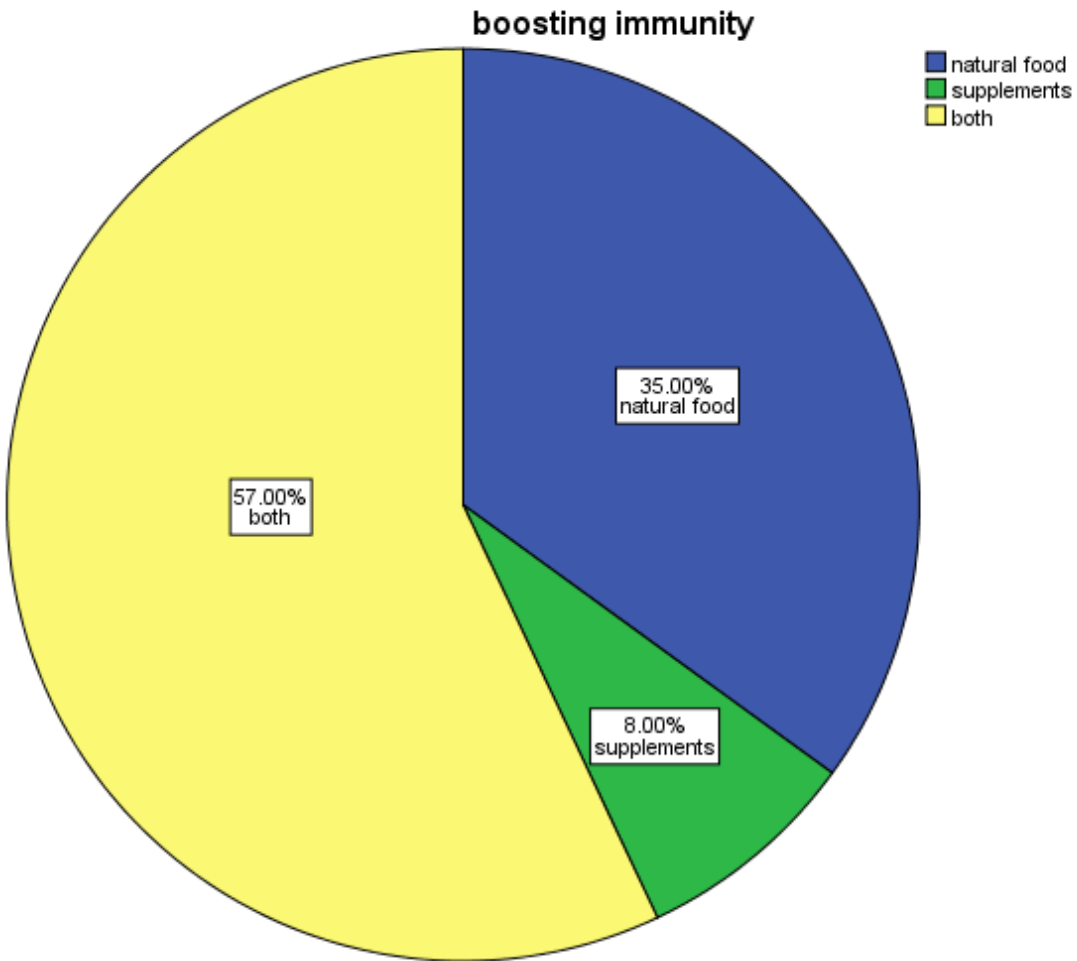


Figure-7: Pie chart shows distribution of responses based on the question “what helps in boosting immunity ” with both, natural food and supplements being the most answered option-57%(yellow) followed by natural food-35%(blue) and 8% supplements(green).

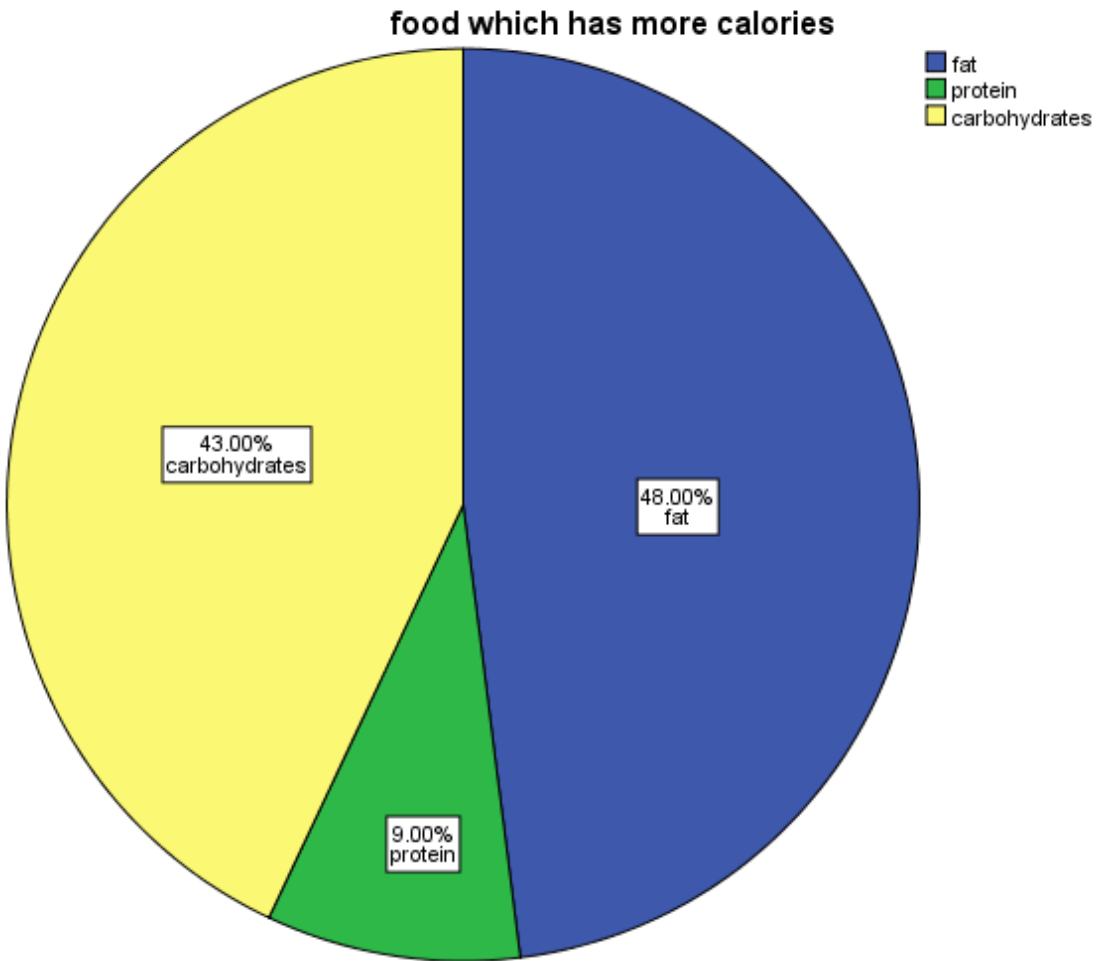


Figure-8: Pie chart shows distribution of responses based on the question “which food has more calories” with fat being the most answered option-48%(blue) followed by carbohydrates-43%(yellow) and 9%-protein(green).

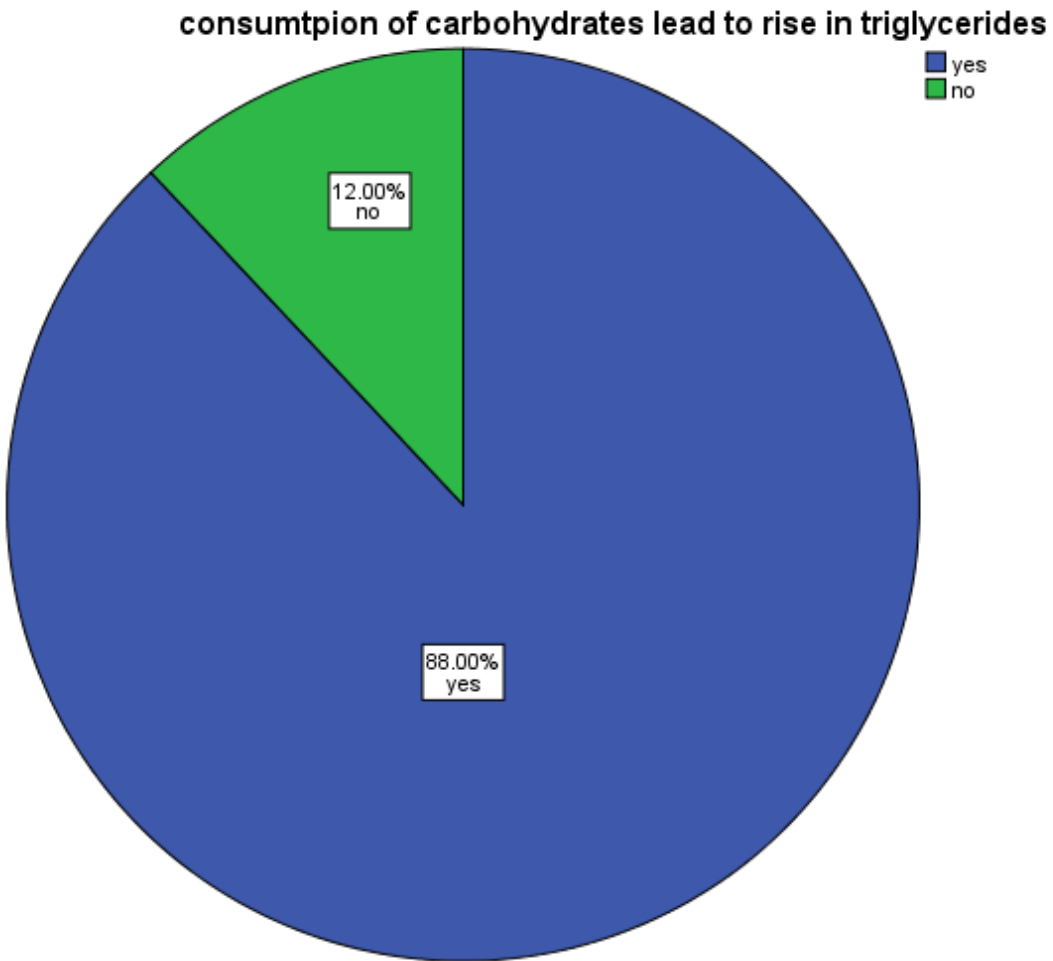


Figure-9: Pie chart shows distribution of responses based on the question “ does consumption of carbohydrates lead to rise in triglycerides ” with yes being the most answered option-88%(blue) followed by no-12%(green)

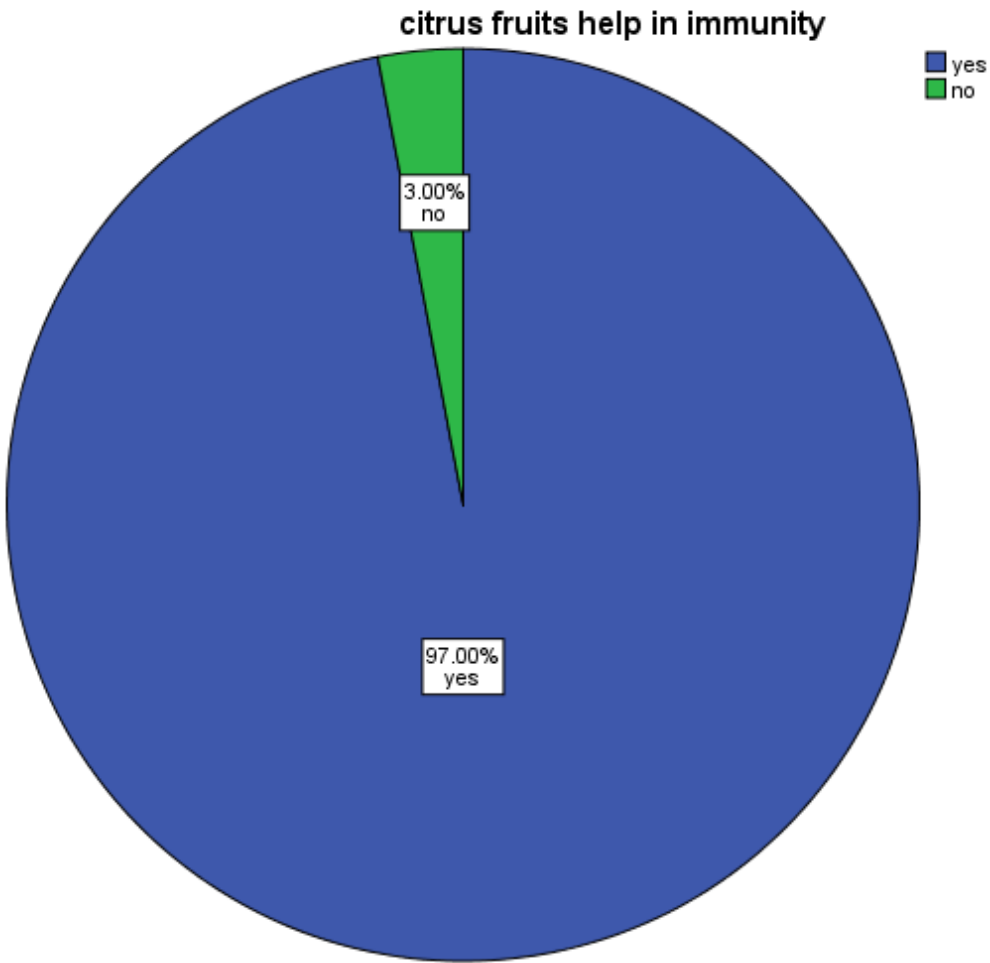


Figure-10: Pie chart shows distribution of responses based on the question “ does citrus food help in immunity” with yes being the most answered option-97%(blue) followed by no-3%(green)

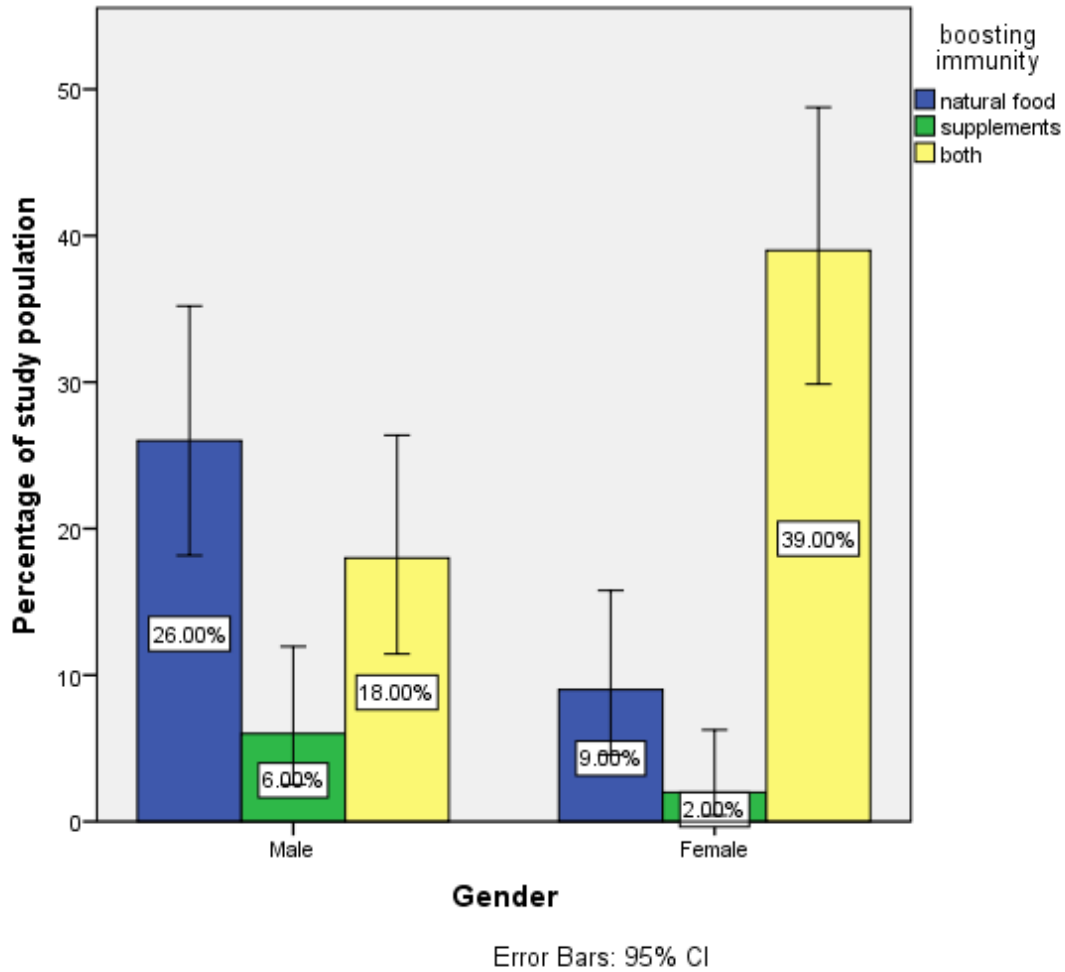


Figure-11: This error bar graph shows association between type of Gender and boosting immunity X-axis represents the Gender and Y- Axis represents the percentage of study population . Blue indicates natural food, green indicates supplements and yellow indicates both..Chi square test was done showing $p=0.000(p<0.05)$ which is statistically significant.

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