

# CHANGE IN THE DIETARY HABITS OF PEOPLE DURING THEIR NORMAL LIFESTYLE VS LOCKDOWN PERIOD- A QUESTIONNAIRE SURVEY

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## ABSTRACT

Humans require different quantities of diet to lead a healthy and active life. Good nutrition or proper intake of diet is necessary which is in relation with the body's dietary needs. A well balanced diet plays a major role and becomes the cornerstone of good health. The type of diet consumed by the people has lost its quality over the years due to the work pressure and stress experienced by the people. During a pandemic, where people are forced to stay at their homes, the food consumption changes. There is a lot of possibility of people to change their diet in order to improve the quality of their life. A questionnaire was prepared regarding the changes in the dietary habit of the people during the lockdown vs normal period. It was circulated among the people of Tamil Nadu. The questionnaire was uploaded in google forms. Finally, the data was collected, compiled and statistically analysed. The dietary habits have changed to a significant level during this lockdown period. There is an increase in the consumption of food during the lockdown when compared to the normal lifestyle. This study reveals that the lockdown has affected the people's dietary habits due to multifactorial reasons

**Keywords:** Balanced diet, cornerstone, lockdown period, normal lifestyle, nutrition

## INTRODUCTION

Humans require a wide range of nutrients to make their lifestyle healthy and active. For these nutrients to reach them properly they need to take a balanced nutritious diet. A well balanced diet contains all the nutrients in the right proportion. Intake of a well balanced diet at regular intervals ensures good health and well being. Poor nutrition leads to decrease in immunity, which increases the susceptibility to any type of disease, impaired physical and mental development which indirectly causes retardation. Poor eating habits and inadequate physical activity can increase the risk of obesity. The normal lifestyle of people comprises mainly carbohydrate rich food, sedentary tendencies which is added by the increased consumption of high caloric foods and beverages (Barquera *et al.*, 2010). The decrease in consumption of food due to work pressure in people's normal lifestyle has certain effects like fatigue, poor appetite, abnormal weight loss etc.

Hypothyroid individuals have weight gain despite poor appetite, cold intolerance, constipation and lethargy (Samuel and Devi, 2015). This decreases the consumption of natural and healthy foods like fruits, vegetables, legumes and whole grains (Rivera *et al.*, 2002). People tend to skip their breakfast, not bringing packed lunch at their workplaces and hence less consumption of beverages due to insufficient time at their workplace ('Survey: workers skip breakfast', 2008) (Dave and Others, 2016). Many people take part in high physical activity which is strongly recommended by the international guidelines health insurance companies and governmental institutions (Pearson *et al.*, 2002). Lowest BMI is always associated with mortality rate (Lindsted, Tonstad and Kuzma, 1991).

School students are having less satisfactory food habits which reflects the poor quality of life they lead, parents are unable to control children in ensuring a proper diet at the right time (Leis *et al.*, 2007). Substantial change in lifestyle usually takes place at the start of college or working life (Stok *et al.*, 2018). Unhealthy eating is developed by these students especially when they leave home due to the decrease in fibre rich food. (LaCaille *et al.*, 2011). During this normal lifestyle, it would be difficult to follow a balanced diet due to work and many other social activities. School students and college students are the most affected population regarding the diet intake in their regular lifestyle. According to a research, a shift from eating fresh foods, such as fruits and vegetables, to processed foods may be linked to an increase in asthma cases in recent decades (Cutler, 2011). During a pandemic situation, the food consumption would increase in order to boost their immunity to fight against this pandemic.

Breakfast consumption would significantly increase paving way to better dietary habits thereby improving immunity. There would be an increase in the consumption of intermeal snacking at home during this quarantine. The nutritional status of individuals are considered to be an indicator for resilience against destabilisation ('Reclaiming our food: how the grassroots food movement is changing the way we eat', 2012). It completely depends on the person's dietary intake which makes up the characteristics of immune responses to our body to fight against the pandemic (Wypych, Marsland and Ubags, 2017). Access to food also plays a major role in the action of people towards the community and national levels. People working at home especially in sitting or supine positions for a long period of time increases the sedentary behaviours (Hobbs *et al.*, 2015). People staying at home mainly focus on the type of diet they consume in order to fight against COVID. In this current situation, COVID 19 has imposed a few new sets of challenges for each individual to maintain a healthy diet (Yousafzai, Rasheed and Bhutta, 2013). It is necessary for people to become aware regarding the type of food that boosts their immune system (Haug *et al.*, 2007). However, in another study, respondents have stopped non vegetarian food since they feel it would make them vulnerable towards COVID 19 (Heymann and Shindo, 2020). Another study says that consumption of raw or uncooked animal products must be avoided (Adams, Baker and Sobieraj, 2020). Previously, our team had conducted numerous clinical trials (Timothy, Gayatri Devi and Jothi Priya, 2019),(Harsha *et al.*, 2015) and lab animal studies and in vitro studies (Priya, Devi and Others, 2019),(R and Sethu, 2018),(Swathy and Gowri Sethu, 2015; R and Sethu, 2018) over the past 5 years. Now we are focusing on epidemiological surveys. The idea for this survey stemmed from the current interest in our community. The aim of the study is to assess the change in dietary habits of people when they were during the normal lifestyle in comparison with the lockdown period.

## **MATERIALS AND METHOD**

A cross sectional study survey research approach using electronic distribution where a questionnaire was prepared and circulated among all the people of Tamil Nadu comprising age groups above 18 years. All the participants were asked to complete their survey honestly since occupation related variable impacts could be observed and also children below 18 years may not take up this survey seriously. The sampling method used in this study is randomized survey sampling. To minimise sampling bias certain measures were taken which includes framing straight forward questions that sounded simple. The questions were kept short and clear and also simple language was used while framing questionnaires. A self structured questionnaire consisting of 12 questions was checked for validity by three internal experts (from Saveetha Dental College) and also by three externals experts (outside Saveetha Dental College). The questionnaire enquired about the type of diet followed, consumption of meals, beverages and inter meal snacks per day during both the lockdown period as well as normal lifestyle. Google forms were used for data collection. Finally, the data was collected and analysed using SPSS software and Chi square test and Pearson correlation analysis were used, with p value less than 0.05 to be statistically significant.

## **RESULTS AND DISCUSSION:**

From the results of the above survey regarding the changes in the diet followed during normal lifestyle and lockdown, it can be said that the lockdown altered the dietary habits of 61.1% of the quarantined people. There is an increase in the carbohydrate diet in the majority of people. Among the total population of 202 people, 47.3% of the people consume carbohydrate rich food, 32.5% consume protein rich food, 11.3% consume junk food and 8.9% take fibre rich food during their normal lifestyle (figure 1). The bar chart represents the association between the occupation and type of diet followed during the normal lifestyle. The association between the two groups was found to be statistically not significant with the p value of 0.26 ( $p > 0.05$ ) (figure 11). The US report focuses on dietary patterns in relation to the health postulated that combinations of all types of foods are required in a diet (Millen *et al.*, 2016). The pie chart reveals that 47.3% of the study population consumes a high amount of carbohydrate that can have a handful of negative impacts. During the normal lifestyle, the study group population take in approximately the same quantity of carbohydrate but the outcome could be contradicting the above statement because during their normal lifestyle physical activities and exercises are usually done by people (David *et al.*, 2019). Around 61.1% people have agreed that they have a change in the type of diet and 38.9% of people do not have any modifications in their diet (figure 2). The bar chart represents the association between the occupation and the change in the diet during the lockdown period. The association between the two groups was found to be statistically not significant with the p value of 0.169 ( $p > 0.05$ ) (figure 12). The people try to enhance their physical and mental health during their pandemic. Hence, they consume foods that could fight against this pandemic (Naja and Hamadeh, 2020). A majority of 61.1% of the people that there has been a vast change in food habits and dietary intake.

The type of diet followed during the lockdown period by the people include 47.8% of them consuming carbohydrate rich food, 30.5% consuming protein rich food, 14.8% fibre food while others consume junk food (figure 3). The bar chart represents the association between the occupation and type of diet followed during the lockdown. The association between the occupation and type of diet in lockdown was found to be statistically not significant with the p value of 0.295 ( $p > 0.05$ ) (figure 13). Since, the number of days of lockdown are increasing day to day and hence people are prone to develop obesity. Elderly people are more susceptible to diabetes mellitus and heart disease. This could lead to myocardial infarction at serious

conditions (Choudhari and Jothipriya, 2016),(Iyer, Gayatri Devi and Jothi Priya, 2019). It has been recorded that about 46.3% of the people consume beverages twice a day whereas 22.7% of the people consume only once a day (figure 4.1) Although tea contains caffeine, it is less in amount than coffee . During work, tea can act as a stress buster as it contains a chemical called L-Theanine which inhibits the action of cortisol on the brain which leads to the reduction in stress. There is a significant increase in the consumption of beverages as 20% of the people consume thrice a day whereas it was only 15.8% people consuming it in normal lifestyle (figure 4.2). This produces more negative impact on the individual health including enamel erosion, insomnia and disturbed sleep patterns(Rj and R, 2016),(Shruthi and Preetha, 2018). This can occur in people who intake carbonated beverages, tea, coffee respectively. Researches also reveal that coffee though they have health benefits, they can increase the anxiety and stress level.

The consumption of the intermeal snacks in their normal lifestyle is said to be normal or even decreased (figure 5.1). The bar chart represents the association between the occupation and consumption of intermeal snacks in a normal lifestyle. There is a significant difference found between the occupation and consumption of intermeal snacks with the p value of 0.043 ( $p < 0.05$ ) (figure 9).When the study population was following the normal lifestyle, it can be observed the number of intermeal snacks was twice a day maximum due to the fact that school students recess once a day and probably the second time of intermeal snack is during the evening. About 7.4% of people consume the intermeal snacks five times a day during the lockdown, 3% of people consume it 6 times a day which was increased when compared to the normal lifestyle (figure 5.2). This implies that lockdowns have made people lazy to prepare food and this makes them consume snacks every few hours instead of taking properly timed meals. The type of intermeal snacks can have an impact upon the health of the person which in an unhealthy consumption can lead to obesity (Baheerati and Gayatri Devi, 2018),(Renuka and Sethu, 2015). The type of intermeal snack preferred by people during the lockdown period is that almost 52.2% of the people opted for junk food, 28.6% for fruits, 11.3% of the people preferred vegetables and the rest for salads (figure 6).Preference of snacks, and other favourable food items are generally consumed during any type of pandemic by people (Clarke *et al.*, 2014). Majority of people prefer junk food which implies that they are on an unhealthy diet. These people are more prone to leading an unhealthy lifestyle (Fathima and Preetha, 2016).

The consumption of meals per day during normal lifestyle is noticed to be 62.6% of them consuming it thrice a day and 3.9% of the people have it four times a day (figure 7.1). The consumption of meals per day during the lockdown period is where 10% of people consume meals four times a day whereas 48.8% of people consume it three times a day. When a comparison is held between normal lifestyle and lockdown, it could be observed that the number of meals consumed by the study population does not show much variation in lockdown which can be attributed to an increase in intake of intermeal snack due to which the number of intake of meals remains the same. A small percentage of the study population intake meals for four times which could be either due to decrease in intermeal snacks in order to maintain a healthy diet. The various responses obtained for the protein rich substitutes for non veg food are seen to be 34.5% of the people preferring paneer, 29.1% soybeans, chickpeas, lentils etc. while 34.5% wanted substitutes as green vegetables. The bar chart represents the association between the occupation and opinion on different protein rich food. There is a significant difference seen with the p value of 0.028 ( $p < 0.05$ ) (figure 10). Another study suggests soy protein, mushroom, wheat gluten, pulses etc. as a substitute for non veg foods (Kumar *et al.*, 2017). One of the researches have revealed that replacing red meat with vegetables or potatoes reduces the

risk of myocardial infarction (Würtz *et al.*, 2016). Since, there had been a lot of myth regarding the spread of COVID transmission through non vegetarian food, this shows the awareness among people about the mode of transmission and alertness of not preferring non vegetarian food over vegetarian food during lockdown.

## **CONCLUSION**

Despite these limitations, our findings provide valuable information about the changes in the dietary habits of people during normal lifestyle and lockdown period as there is a significant change in the consumption of diet during this pandemic where it is very imperative in this study to focus more on immune rich diet that helps us to enhance our immunity to resist infection. It is highly important to maintain our health in such a pandemic.

## **ACKNOWLEDGEMENTS**

The authors are thankful to Saveetha Dental College for providing a platform to express our knowledge.

## **AUTHOR CONTRIBUTION**

M.Ashritha executed the work by data collection and drafting of manuscript. Dr.Jayalakshmi Somasundaram devised the concept, design of study, validated the data collection, carried out the revision and proofreading of the survey.

## **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

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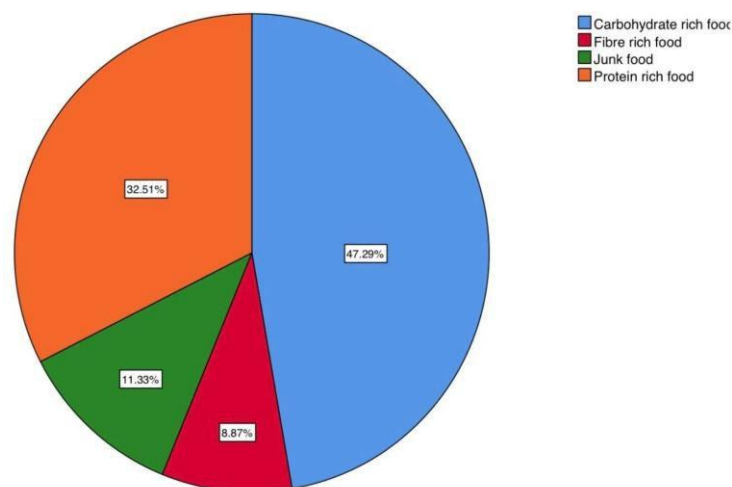


Figure 1: A pie chart showing responses for the type of diet followed by the people during their normal lifestyle. 47.3% of the people consume carbohydrate rich food (blue), 32.5% consume protein rich food (orange), 11.3% consume junk food (green) and 8.9% take fibre rich food (red).

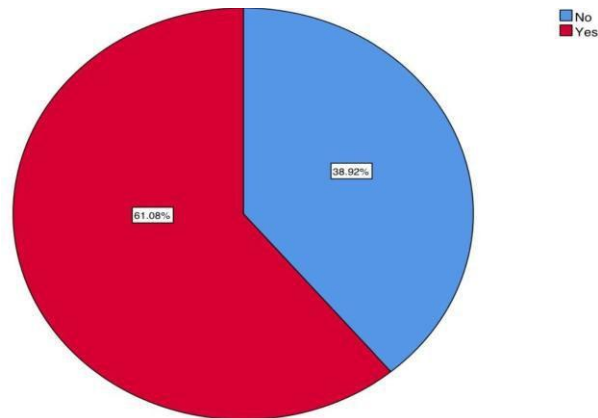


Figure 2: A pie chart that represents the change in the diet by the people during the lockdown period. Around 61.1% people have agreed (red) that they have a change in the type of diet and 38.9% of people do not have any modifications in their diet (blue).

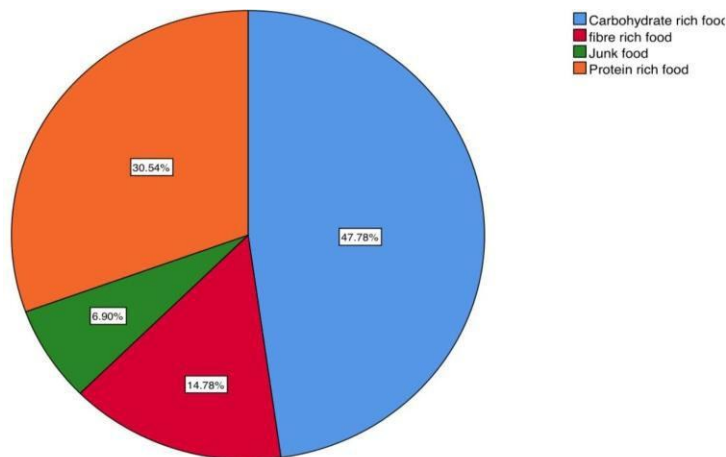


Figure 3: A pie chart showing the type of diet followed by the people during the lockdown period. 47.8% consume carbohydrate rich food (blue), 30.5% consume protein rich food (orange), 14.8% fibre food (red) and 6.9% consume junk food (green).

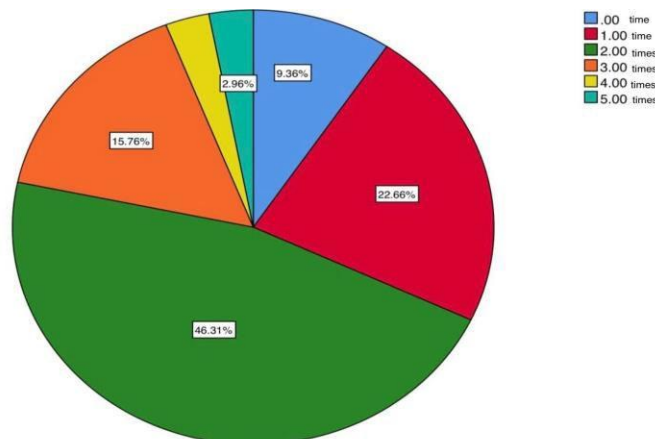




Figure 4.1: A pie chart showing the responses obtained for the consumption of beverages during the normal lifestyle. About 46.3% of the people consume beverages twice a day (green) whereas 22.7% of the people consume only once a day (red), 15.76% of them consume it thrice a day (orange).

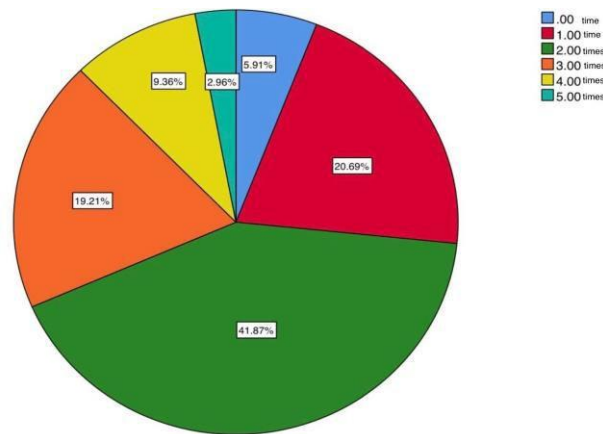


Figure 4.2: This pie chart represents the consumption of beverages during the lockdown. It could be noticed that 20% of the people consume thrice a day (orange), 41.8% of the people consume it twice a day (green), 20.6% of the people consume it only once in a day (red).

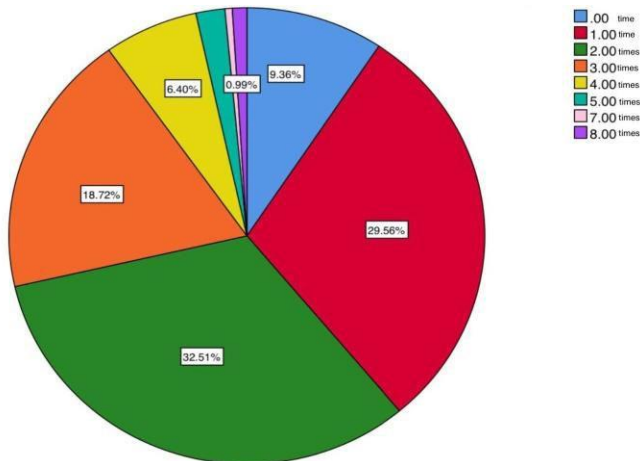


Figure 5.1: This pie chart represents the consumption of intermeal snacks in their normal lifestyle. 32.51% of the people consume it twice a day (green), 29.56% of the people consume it once a day (red), 18.72% of the people consume it thrice a day (orange).

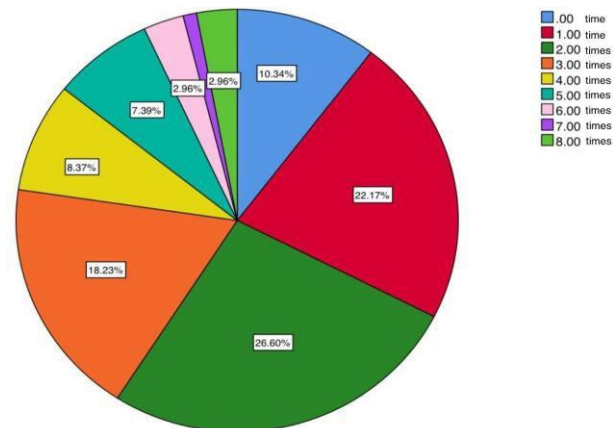


Figure 5.2: This pie chart represents the consumption of intermeal snacks during the lockdown period. Around 26.6% of the people consume it twice a day (green), 18.23% of them consume it thrice a day (orange) and 22.1% of the people consume it only once in a day (red) whereas there is only a small proportion of the people consuming it more than three times a day.

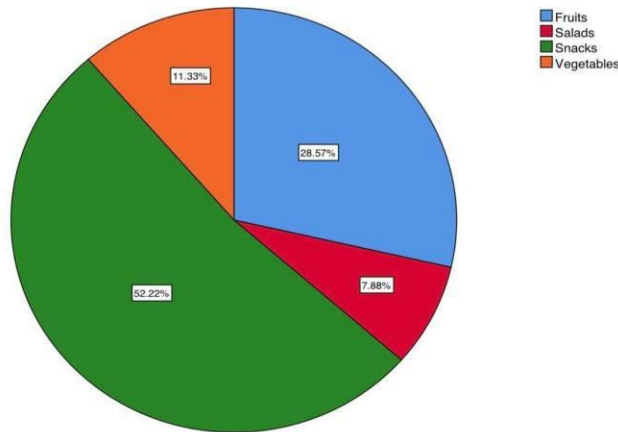


Figure 6: The pie chart depicts the type of intermeal snack preferred by people during the lockdown period. Almost 52.2% of the people opted for junk food (green), 28.6% for fruits (blue), 11.3% of the people preferred vegetables (orange) and the 7.8% of them for salads (red).

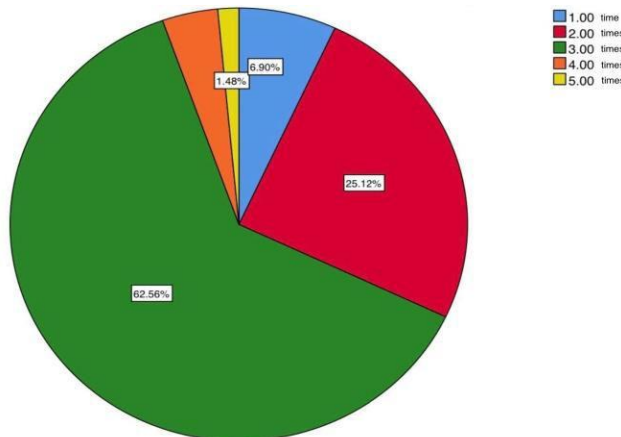


Figure 7.1: A pie chart representing the consumption of meals during the normal lifestyle. Around 62.56% of the people consume it thrice a day (green), 25.12%, twice and day (red), 6.9% of them consume it once a day (blue) while the rest more than thrice a day (orange, yellow)

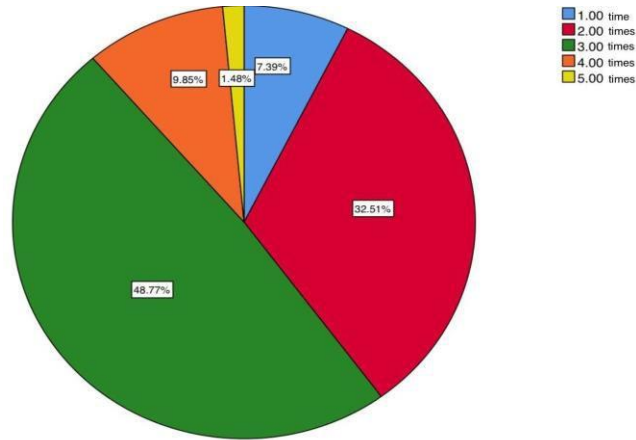


Figure 7.2: A pie chart showing the consumption of meals during the lockdown period. 48.77% of the people consume it thrice a day, 32.5% of the people consume it thrice a day, while 9.8% of them consume it four times a day and 7.3% consume it once in a day.

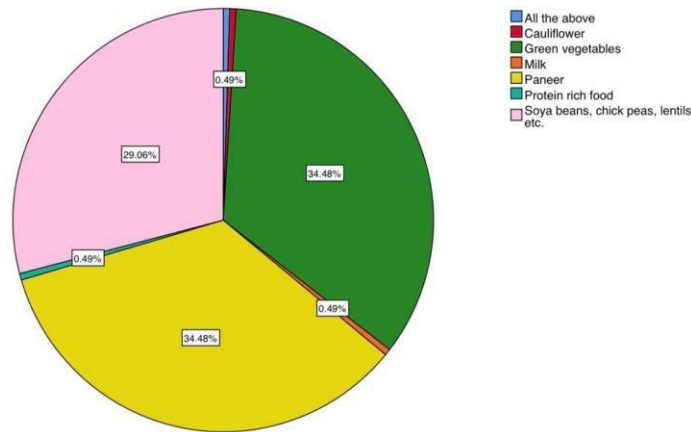


Figure 8: A pie chart showing the different protein rich vegetarian food that can be substituted for non vegetarian food. 34.5% of the people prefer paneer (yellow), 29.1% prefer soyabeans, chickpeas, lentils etc. (pink) 34.5% wanted substitutes as green vegetables (green).

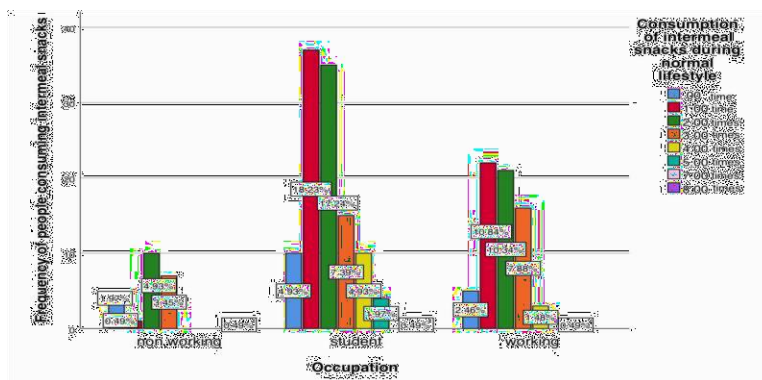


Figure 9: Bar chart represents the association between occupation and consumption of intermeal snacks in the normal lifestyle. X axis represents the occupation and Y axis represents the number of times people consume intermeal snacks during the normal lifestyle. Students were found to consume more amounts of intermeal snacks during the normal lifestyle when compared to other groups. Chi square test shows statistical

significance with  $p=0.043$  ( $p<0.05$ ). There is a significant increase in the intake of intermeal snacks among the students.

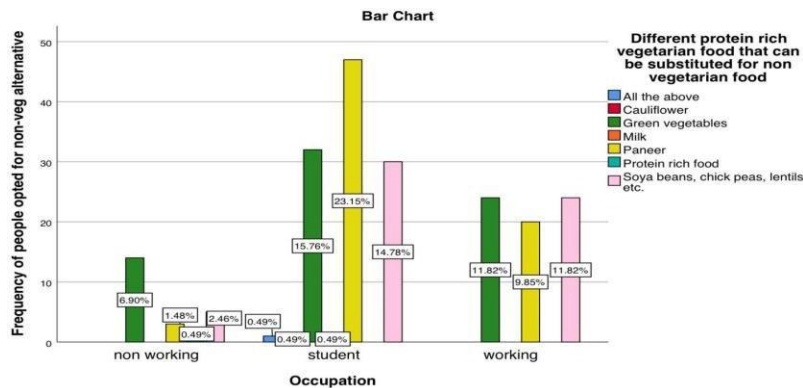


Figure 10: Bar chart representing the association between occupation and the opinions on different protein rich vegetarian food that can be substituted for non vegetarian food. X axis represents the occupation and Y axis represents opinion of preference for non veg alternatives.

Maximum response was given by the students who opted for paneer as a substitute for non-vegetarian food (23.15%). Chi square test shows statistical significance with  $p=0.028$  ( $p<0.05$ ). There is a significant increase in preference of paneer as a substitute for non vegetarian food among students than other groups.

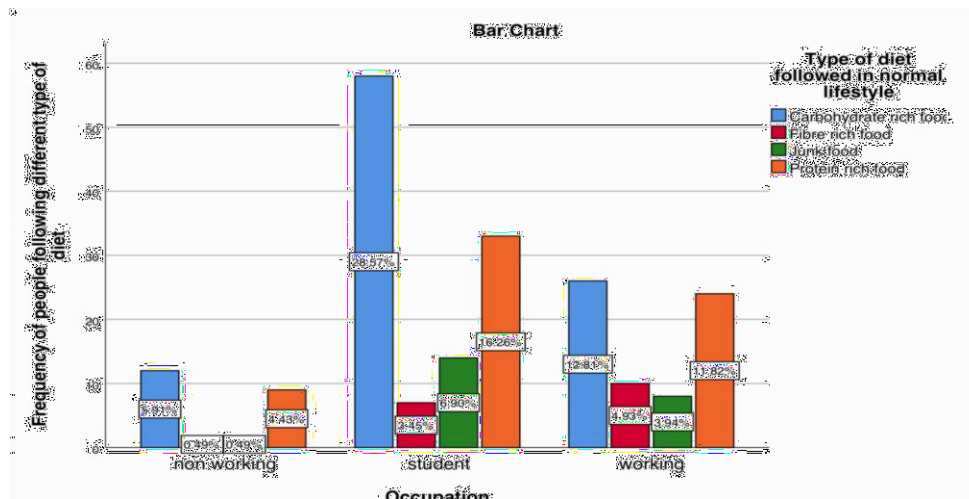


Figure 11: Bar chart showing the association between occupation and diet followed during normal lifestyle. X axis represents the occupation and Y axis represents the percentage of the type of diet followed during the normal lifestyle. The majority of students were found to consume carbohydrate rich food during the normal lifestyle when compared to working and non working people. Chi square test was done and the association between the two groups was not found to be statistically significant [p value-0.260 ( $p>0.05$ )-not significant].

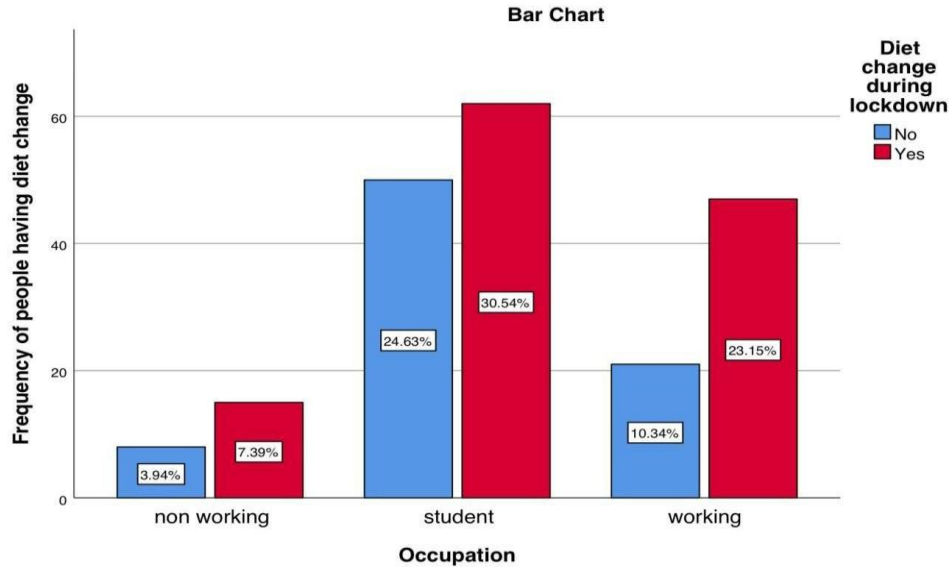


Figure 12: Bar chart representing association between occupation and whether the diet during the lockdown has changed. X axis represents the occupation and Y axis represents the rate of people having the change in the diet during the lockdown. The maximum percentage of responses was for yes. The change in the type of diet during the lockdown period is seen more among the students than the working and non working people.

Chi square test was done and the association between the two groups was not found to be statistically significant. [p value-0.169 ( $p > 0.05$ )-not significant]

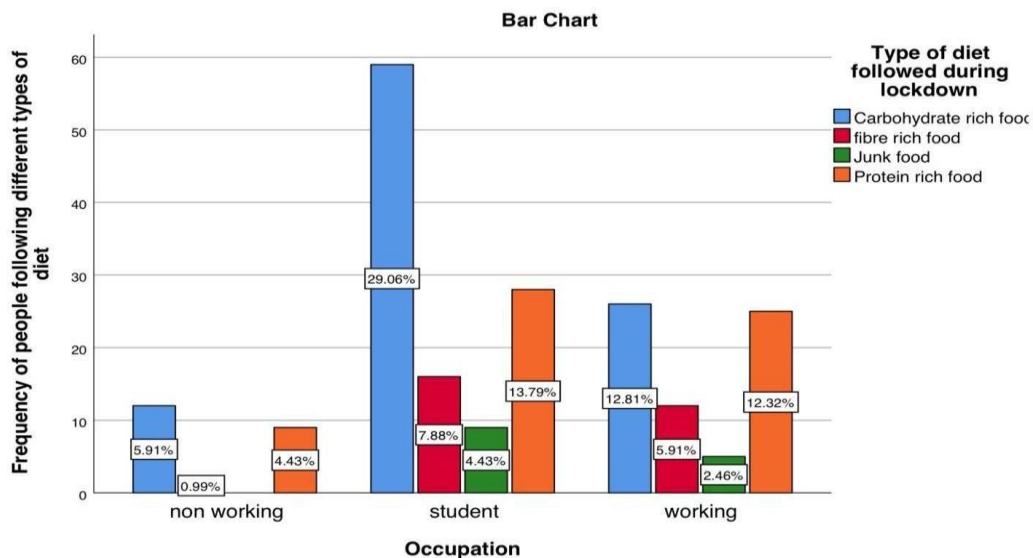


Figure 13: Bar chart representing the association between the occupation and type of diet followed during the lockdown. X axis represents the occupation and Y axis represents response regarding the different types of diet followed during the lockdown period. carbohydrate consumption was found to be highest in the students when compared to working and non working. Chi square test was done and the association between the two groups was not found to be statistically significant. [p value-0.295 ( $p > 0.05$ )-not significant]

