



# INFLUENCE OF FOOD PATTERN ON LIFE OF PEOPLE DURING COVID-19 LOCKDOWN

Vijeta Singh<sup>1</sup>, Poonam<sup>2</sup> and Rakesh Kumar Behmani<sup>3</sup>

Vijeta Singh (Assistant Professor), Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India

Poonam (Assistant Professor), Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India

Rakesh Kumar Behmani (Professor), Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India

Department of Applied Psychology, Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India

**Abstract:** Food is an indispensable part of life. Food not only provides us energy, nutrients and nourishes our body, but it also generates feelings of calmness, alertness and joy. Studies have provided evidence of food providing support in coping with feelings such as stress, despair, frustration, boredom or anxiety. We have a huge variety of food choices in our everyday lives. However, the lockdown announced due to COVID-19 pandemic led to shutting down of all the businesses except the basic necessities which includes, food, medicines, finances and other essential services. The government took several necessary measures so that the lives of people were not severely influenced while working to stop the spread of COVID-19. People continuously stayed home during lockdown and during this period food influenced people's lives in various forms. The present study was carried out to know how lockdown due to COVID-19 has influenced the food pattern of people. The participants filled the online survey questionnaire which consisted of 20 questions regarding the food pattern that they experienced during lockdown. The total number of participants was 1011. The age range of the participants was 13 to 75 who were from different states of India. 41.34% males and 58.65% females participated in the study.

**Key words:** Diet, Food Pattern, Mental Health, Physical Health.

## I. Introduction

“Let food be thy medicine and medicine be thy food.” — **Hippocrates**

Food is an indispensable and central part of our lives. A life without food can never be imagined. It is necessary for survival. Studies have revealed that food not only provides us energy, nutrients and nourishes our body but it also generates feelings of calmness, alertness and joy. We have a huge variety of food choices in our everyday lives. We could eat whatever we want, whenever we want and wherever we want. But everything came to a standstill when lockdown due to COVID-19 pandemic was announced. People knew that they had to stay indoors so the first thing that struck their minds was to collect as food as possible so that they don't suffer afterwards.

Humans eat food when they are energy deficient and feel hungry. However, the homeostatic regulation of eating is regularly influenced by food and food related cues. Various researches have been conducted to comprehend the relationship between emotions and eating behaviour of humans. Eating food works as an incentive and encouragement for people. Eating and food choices are influenced by biological factors, anthropological factors, social factors (Herman & Polivy, 2004), environmental factors (Cohen & Babey, 2012; Stroebele & de Castro, 2004), cultural factors, individual food preferences and many more. Vögele and Gibson (2010) found that there is inherent effect of food on mood and emotions. One can overcome various health consequences by modifying patterns of food consumption over the course of life (Kant, 2000).

## II. Review of Literature

Studies suggest that stress and negative affect can lead to a general increase in food intake or opting for unhealthy choices of food. Right amount of quality and quantity of food with correct balance of nutrients is required to lead a healthy life. A person needs persistent self-regulation and supervision so that one could enjoy the perks of food without becoming too ecstatic.

### How food affects physical health

Nutrients are required for maintaining good health of an individual. Healthy eating facilitates the proper functioning of brain and lowers the risk of physical health problems such as heart problems, diabetes and arthritis. Taking a proper diet affects the sleeping patterns, energy level and the general health. Consumption of certain foods can elevate the energy levels and concentration, whereas contradictory results have also been seen. Deficiency of particular nutrients in the diet may lead to impairment in the functioning of the body (Proceedings of the Nutrition Society, 2004).

The amount of dietary intake has a crucial relationship in development of obesity (Cheung et al., 2018; Guo et al., 2002; Lichtenstein et al., 1998; Livingstone & McNaughton, 2016). Children who indulge in food consisting high fat amount are at greater risk of obesity (Klesges et al, 1992). Diet and lifestyle are connected with the risk of developing obesity, type 2 diabetes, CVD, cancer, dental diseases, osteoporosis in people (Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases, 2002).

Eating proper diet contributes significantly in the maintenance of overall health and well-being. Embracing healthy diet routine from early age plays a critical role in prevention of development of chronic diseases at a later stage in life. Healthy diet and good dietary pattern help in maintaining healthy body mass index (Min et al., 2017). Whole grain diet has been proved to be beneficial for people who are overweight and obese (Mey & Kirwan, 2020). Including fruits and vegetables in diet has led to positive impact in prevention of different types of cancer and coronary heart disease (Gerster, 1991; Hertog et al., 1993).

People with healthy weight, but having poor diet are also at risk of health concerns such as heart problems, hypertension, type 2 diabetes, osteoporosis, and some types of cancer. Ingenious and healthy food choices help in protection from various health problems. There is increased risk of chronic diseases, such as hypertension and type 2 diabetes in younger population. These problems were earlier normally seen in adults and are considered a result of consuming unhealthy food and increased weight in youngsters. Dietary habits acquired during early years of life often continue through adulthood, therefore instilling healthy habits during childhood might keep them healthy in later years of life.

### **How food affects mental health**

“One cannot think well, love well, sleep well, if one has not dined well.” — **Virginia Woolf**

Food is also used in coping with feelings such as stress, despair, frustration, boredom, or anxiety, or enhance the feeling of pleasure, joy and relaxation. Sometimes, the comforting process is short lived and might produce negative results later. While this may help in the short term, eating to soothe and ease your feelings often leads to remorse regret and culpability. Some individuals may even face surge in negative feelings as a result of eating more food. So, eating food does not help in dealing with the situation that is the root cause of stress. There is a close relationship between the pattern of meals and food consumption with body dissatisfaction and overfat status (Bibiloni et al., 2013).

The amount of food intake and the type of food consumed has an influence on the mood of the individual. For example, increasing the amount of fresh fruits, vegetables, nuts, and whole grains in diet can lower the risk of some mental health conditions such as depression, while eating foods that are high in sugar and saturated fat may lead to increased risk. Mediterranean diet can be applied as an effective strategy to prevent mental disorders as it improves cognitive functioning of an individual (Huhn, 2015). Nutrients such as Omega-3 FAs, Folate, vitamin B6 and B12 have been proved to be beneficial for mental health.

Dietary intake and nutritional status of people play a significant role in influencing the mental health and in the development of psychiatric disorders. Saturated fat and simple sugar are considered detrimental to cognitive function (Lim et al., 2016). Nutrition plays an effective role in maintaining mental health of individuals and emotional well-being. Poor nutrition can result in poor mental health. Healthy dietary intake could help in improving mental health and well-being (Wattick et al., 2018). Food insecurity has been shown to be associated with poor mental health (Martin et al.,

2016). Studies have confirmed strong relationship between nutrition and mental health in adults (Meegan et al., 2017; Ohmori et al, 2016). Diet therapy also helps in recovery from illnesses and maintaining good health (Mudambi, 2007).

The literature on nutrition and mental health has found evidence which suggests that nutrition might be instrumental in the prevention, development and management of mental health problems such as depression, schizophrenia, anxiety, dementia and ADHD. Feeding the brain with a diet that provides adequate amounts of complex carbohydrates, essential fats, amino acids, vitamins, minerals and water can support healthy neurotransmitter activity. It can protect the brain from the effects of oxidants, which have been shown negatively to impact mood and mental health. (Mental Health foundation, 2017). The purpose of the survey was to study the food pattern and its influence on lives of people during COVID-19 lockdown.

### III. Methodology

#### a. Measures

The study was carried out by using a web-survey named “Food and Lockdown Life” to obtain data from different parts of India about eating habits of people during lockdown which was enforced due to COVID-19 pandemic. The survey was conducted from 23<sup>rd</sup> May to 30<sup>th</sup> May 2020 by using online platforms. The response of each participant was collected using linked survey and response were automatically generated and recorded. The online survey helped in wide propagation of the survey questionnaire as lockdown had strict regulations regarding outdoor movement.

The questionnaire was built by using Google forms and consisted of 20 questions. The participants were asked to provide feedback regarding food availability, food pattern, cooking food, weight etc. and personal data were also collected. Participants completed the survey which was directly connected to the Google platform. The confidentiality of the participants was fully maintained. The responses of each complete questionnaire were transmitted to Google forms and the final database was downloaded as a Microsoft Excel sheet.

#### b. Sample:

The survey questionnaire was initially filled by 1014 participants by people of different states of India. The final sample consisted of 1011 participants. The simple random technique was used for collecting data. Two double responses and one response from participant residing in another country was removed. This study consisted of Indian participants from various states. The age of the participants who took part in the study was 13 to 75 years.

### 3.3 Statistical analysis:

After collecting the data, statistical analysis was done with the help of descriptive statistics (mean, standard deviation). Data is represented as number and percentages.

## IV. Result and Discussion

**Table 1: Descriptive Statistics**

Descriptive Statistics					
	N	Minimum	Maximum	Mean	SD
<b>Ftotal</b>	1011	20.00	54.00	33.92	5.69
<b>Valid N (listwise)</b>	1011				

The questionnaire was distributed through online platforms on 23<sup>rd</sup> May 2020. The final sample consisted of 1011 participants, aged between 13 and 75 years. The average age of the participants was 29.27. Average male age was 31.78 and the average age for females was 27.51. Of the overall 1011 participants, 418 were males and 593 females, i.e. 41.34% males and 58.65% females participated in the study. The descriptive statistics show that the food pattern of 57.89% males and 41.48 % females were affected during the Covid-19 lockdown. Their eating habits, food preparation, more interest in food, weight gain or weight loss and health was affected during lockdown. While, 42.10% of total males and 58.51% females were not much affected by food life. These people were not affected by the availability of food, preparation of food, food choices available during lockdown.

Availability of food during lockdown was a major concern. The study revealed that 85.5% people said that food was easily available during lockdown, which was a good sign in such stressful times. However, a few parts of the population faced some issues regarding food. Along with the government, the general public also helped in providing food to these needy ones. The study revealed that 50.34% people provided food to the needy people during lockdown.

The study showed that food helped in relieving stress in 65% people. The pandemic has forced people to think more about health and healthy habits. It was found that 74% people focused more on healthy eating. 57.76% people preferred to gain information regarding healthy diet on the internet. People were not able to eat outside, nor were they able to ask for deliveries due to lockdown. As a result, 90.4% people felt better after eating home prepared food. People who had more time at hand engaged in making various types of food. 65.7 percent people said that they tried making new type of food which they had never cooked before.

It was found that 63% people took interest in cooking, which included 34% males and 66% females. 51.63% people searched more about food on the internet. People could not eat outside food still 71.61% people felt that they were able to fulfil their food choices. So, eating as well as making food helped people in dealing with their stress. The study also revealed that 20.8% people gained body weight during lockdown out of which 45% were males and 54% were females. On the other hand, 25.6% people lost their body weight, which included 45% males and 56% females. 92.5 people focussed on maintaining food hygiene and 82% people felt physically healthy during lockdown period.

Appendix 1 can be seen at the end for the details of result of the survey questionnaire.

The study helped in understanding the food pattern of people who were restricted to stay at home due lockdown which was enforced by the government to contain the spread of the virus. The outdoor access was limited and threat was severe. People were feeling anxious, afraid, frustrated and bored during the pandemic situation as they had to manage work, home and health at the same time. So, there was impact of the situation on food pattern and dietary habits of people.

### **Control over amount of food**

According to the study, it was difficult for 26.11% of people to control the food amount during the lockdown. 38.63% males and 61.36 % females responded that they were not able to control their food amount during lockdown. Some people eat in large quantity over a discrete period of time and they don't have control over the amount they are consuming. This is generally referred as binge eating and is linked with stress in people (American Psychiatric Association, 2013).

It is often difficult to differentiate between hunger and appetite, sometimes it is mood that leads people to eat food rather than appetite. Studies show that it is important to understand when we feel full, eating with others could lead in consumption of more food. Lack of sleep produces appetite-stimulating hormones and can result in eating more food. Researchers believe that sleep deprivation is one of the major factors responsible for obesity in people. Three clusters of key ingredients have been identified by researchers which make the food hyperpalatable and make people wanting to eat more (Fazzino et al, 2019).

### **Weight loss and Weight gain**

The study also revealed that 20.8% people gained body weight during lockdown out of which 45% were males and 54% were females. On the other hand, 25.6% people lost their body weight, which included 45% males and 56% females. The biological mechanisms of human body make weight loss maintenance difficult. It has been suggested that genetics shape almost fifty percent of weight changes and the other fifty percent is decided by the environmental factors. Higher cortisol exposure during chronic stress influences the reward system of the body which results in an unwarranted intake of highly appetizing foods (Adam, & Epel, 2007).

Zellener et al., 2006 found that consumption of food escalates during stress. People eat more unhealthy diet while going through the period of stress, particularly women. This could be the potential reason why more females gained weight during the lockdown period. It was found in a study that the eating pattern is modified by stress in a bidirectional manner, around 30%, people decreased their food intake and lost weight when going through or after stress, while it was demonstrated that most people increased intake of food during stress (Epel et al., 2004; Stone & Brownell, 1994).

## Food and stress

The study showed that food helped in relieving stress in 65% people. Food consumption is associated with stress as stress brings alterations in food choice of people. Emotionally stressed people tend to eat sweet, fatty foods more as compared with non-emotional and carefree people (Oliver et al., 2000). Unhealthy pattern and style of food can intensify the stress levels, which can lead to various health risks (Gonzalez & Miranda-Massari, 2014). The brain reward circuitry system may be a key player in stress-induced food intake. Higher fruit and vegetable intakes have been found to be linked with lower oxidative stress and inflammation (Giugliano et al., 2006). The Mediterranean dietary pattern was found to be a likely factor that can help in the prevention of depressive disorders (Sánchez-Villegas et al., 2009). It has been observed in epidemiological studies that substantial inverse relationship exists between annual fish consumption and clinical depression (Hibbeln, 1998).

Opie et al., (2016) proposed five dietary recommendations which can act as a hindrance against depression. These are eating the Mediterranean, Norwegian, or Japanese diet; raising the quantity of fruits, vegetables, legumes, wholegrain cereals, nuts, and seeds in the diet; taking diet rich in omega-3 polyunsaturated fatty acids; substituting unhealthy meals with nutritious foods and restraining the amount of processed-foods, 'fast' foods, commercial bakery goods, and sweets. A German study demonstrated that consumption of Vitamin C helps in stress reduction, boosts the immune system and lowers blood pressure during anxious situations. Dark Chocolate, oatmeal, Chamomile and mint are some of the foods that can help in relieving stress (Katz, et al., 2011; Abascal & Yarnell, 2004; McKay & Blumberg, 2006; Srivastava et al., 2010)

## Food preparation and mood

It was found that 63% people took interest in cooking, which included 34% males and 66% females. 57.76 % people felt that making food made them happy. 65.77 % people tried making new type of food that they had not tried before. 30.30% males while 69.69% females felt happy in preparing food for the family members. So, males along with the females showed participation in food preparation. This also shows changes in social norms where kitchen and food preparatory work was only confined to women. However, 27.39 % people felt that making food is a difficult task.

Activities which are enjoyed by individuals helps in relaxation and relieving of stress. People who enjoy cooking feel the state of flow" thus enhancing their personal satisfaction and relaxation. The state of flow also reduces fear, anxiety and compensates the effect of stress (Gutman & Schindler, 2007). Cooking requires focus and its relaxing effect helps in forgetting the troubles, pressures and stressors (Benson et al., 1974).

Food preparation has been included in the list of 35 activities that stimulates the feeling of flow and relaxation. Cooking necessitates focus and is comprised of repetitive tasks and thus, it corresponds to the definition of a relaxing. People state that cooking food with a close and loved person brings forth positive emotions (Locher et al., 2005). Food preparation helps in seeking pleasure and deters negative feeling such as guilt and shame (Daniels et al., 2012). People

who derive pleasure from cooking obtain feelings of pride (Desmet & Schifferstein, 2008) and enjoyment, satisfaction from the process of making food (Aarseth & Olsen, 2008).

Food cravings are a normal part of human experience. It is an accepted fact that people crave for a particular food as a customary habit (Rodin et al., 1991; Weingarten & Elston, 1991). Craving of food and food intake is expected to be complicated because an individual can control and endure cravings. Certain other obstructions such as food availability also influence the food choice and cravings.

### **Food intake**

However, it was found that 28.78 % participants reduced their food intake. It could be because of the availability of food and stress of the situation. Negative self- beliefs such as feeling unappealing, incapable and undeserving might act as a stimulus to start dieting and lose weight. Food intake decreases in some people in order to become more attractive and admirable. People generally reduce food intake because they are disappointed with the way they look (Heatherton & Polivy, 1992). Self-reported surveys have shown that food intake in 38–72% sample reduces when people are stressed, 28–50% people increased food intake while a minor part of sample showed no changes in amount of food intake (Weinstein et al., 1997; Willenbring et al., 1986; Oliver and Wardle, 1999).

### **Eating food makes me happy**

61.62 people felt that eating food made them happy. 72.6% stated that they enjoy eating different types of food during lockdown. Comfort eating is a notion that propagates that eating specific foods make people happier and help in feeling better during illness. Chocolates and sweet desserts are most popular comfort foods; however, comfort foods differ from individual to individual. Scientific evidences suggest that our food choices affect the gut bacteria. Foods such as chocolate help in health of microbiome which is associated with happiness. Various investigations have advised that certain dietary comprising of vitamins and minerals may possibly prove to be advantageous for psychological health.

Fruits and vegetable are rich in nutrients resulting in better psychological health (Rooney et al., 2013). Healthy food choices which means including fruits and vegetables in the diet has physical as well as mental health benefits (Bishwajit et al, 2017; Li et al., 2017). Eating healthy food can be marked as a long-term investment in health and well of an individual. Consuming fruits and vegetable predict an upsurge in happiness, life satisfaction, and well-being (Mujcic & Oswald, 2016) and optimism (Kelloniemi & Laitinen, 2005). Blanchflower, 2013 found in a large sample of a British study that fruits and vegetables are related to different areas of psychological well-being such as happiness, life satisfaction and mental well-being. FV is also associated with happiness (Piqueras et al., 2011) and life satisfaction (Grant et al., 2009; Lengyel et al., 2009). It has been shown in various researches that healthy eating is instrumental attaining happiness (Veenhoven, 2019).



## Effect of home prepared food

It was found in the survey that 90.4% people felt better after eating home prepared food. Unhealthy diet is linked with a variety of physical as well as mental health issues. Studies have confirmed that frequent eating of food prepared at home together with family is associated with healthier and happier kids and adolescents. Individuals who often have food cooked at home are likely to be more happy and healthy. Such people eat decreased amount of sugar and processed foods, leading to increased level of energy and improved mental health. Eating together at home can make us feel happier even outside of meal times.

The National Health and Nutrition Examination Survey (NHANES) found in a study in which data was collected over the years of people who ate out and the results demonstrated that there was an increase in consumption of calories, sugar, saturated fat and sodium when people ate in restaurants. A study conducted by the Center for Science in the Public Interest (CSPI), 2014 discovered that most of the illness caused by foods are attributable to food eaten at restaurants.

## V. Conclusion:

In this study, the food pattern and eating style of Indian population was during COVID-19 lockdown was explored. Overall, lockdown affected the food life of people in many ways. The study also revealed that 20.8% people gained body weight during lockdown out of which 45% were males and 54% were females. On the other hand, 25.6% people lost their body weight, which included 45% males and 56% females. 92.5 people focussed on maintaining food hygiene and 74.08 % people focused more on healthy eating during lockdown. Thus, it was found that people regarded food pattern as utmost priority during this period.

The lockdown period was one such situation when people had to think about availability and were apprehensive because of COVID-19. Evidence from researches indicate that changes in food pattern choice under stress could be expected. Mood can influence food choice of people and food choice can bring changes in the mood of an individual which could be attributable to various reasons. Some studies have found that food intake grows in some individuals when they are stressed (Greeno & Wing, 1994; Heatherton et al., 1991) which was seen in some people during lockdown. It has been registered that people normally consume unhealthy, energy-dense foods during stress (Groesz et al., 2012; Kandiah et al., 2006). Still, people were able to inhibit their cravings and ate healthy home cooked meals.

COVID-19 pandemic has adversely affected the world and people at large scale. But it has also led people to improve their physical health, maintain hygiene, cook homemade food, taking proper sleep and spending quality time with family. Meals prepared at home are healthier, save money and use healthy ingredients. They are beneficial as allergic foods can be avoided, amount of food can be controlled and family can eat together. Food became a source of comfort for the people during lockdown. People relieved their stress and became happier while eating and preparing food.

## VI. Limitations and Implications of the study

The study was conducted through online platform to reach the population during the situation of pandemic still some important part of the population could not be reached. The sample size could have been improved and made larger, but this didn't happen due to various reasons. Some part of the population could not fill the survey because they find the conventional paper surveys more comfortable. Various studies have been conducted to know the influence of food pattern and eating habits of people during normal time. But this study was done with the purpose of understanding the food habits and the pattern of food life during the stressful period of pandemic. People were cautious and afraid as social distancing was being followed and care of hygiene were an ultimate priority to prevent the spread of COVID-19.

The quality and quantity of food is a necessary part of life and it affects physical as well as mental health. The well-being of a person is influenced by the food that is consumed. The study demonstrated that life of humans is influenced by food and food influences the life of humans. The relationship between food and life is bi-directional. The availability of food, food preparation and eating food helped them in easing their difficulties and made them happier during the situation of a pandemic. There are various other factors that affect dietary habits and some different aspects of food pattern were influenced during lockdown. In further studies, the other factors that influenced peoples' food pattern need to be studied. More sample needs to be collected for widening the scope of future research.

**Author Contributions:** Conceptualization, V.S.; P. and R.B.; Formal analysis, V.S.; Investigation, V.S.; P. and R.B.; Methodology, V.S.; Project administration, V.S.; P. and R.B.; Supervision, R.B.; Writing—original draft, V.S. Writing—review & editing, V.S.. All authors have read and agreed to the published version of the manuscript.

**Funding:** The authors received no financial support for the study.

**Acknowledgments:** The authors wish to thank all the participants for their cooperation and the completion of the survey.

**Conflicts of Interest:** The authors declare no conflict of interest.

## VII. References

1. Aarseth, H., & Olsen, B. M. 2008. Food and masculinity in dual-career couples. *Journal of Gender Studies*, 17(4), 277–287. doi:10.1080/09589230802419922 .
2. Abascal, K., & Yarnell, E. 2004. Nervine herbs for treating anxiety. *Alternative & Complementary Therapies*, 10(6), 309-315.
3. Adam, T. C., & Epel, E. S. 2007. Stress, eating and the reward system. *Physiology & Behavior*, 91, 449-458.
4. Benson, H., Beary, J. F., & Carol, M. P. 1974. The relaxation response. *Psychiatry*, 37(1), 37-46.
5. Bishwajit, G., O’Leary, D. P., Ghosh, S., Sanni, Y., Shangfeng, T., & Zhanchun, F. 2017. Association between depression and fruit and vegetable consumption among adults in South Asia. *BMC psychiatry*, 17(1), 15.
6. Blanchflower, D. G., Oswald, A. J., & Stewart-Brown, S. 2013. Is psychological well-being linked to the consumption of fruit and vegetables?. *Social Indicators Research*, 114(3), 785-801.
7. Briony, H. 2018. The scientific link between happiness and food. <https://www.worldgovernmentsummit.org/observer/articles/the-scientific-link-between-happiness-and-food>
8. Brug, J., Lechner, L., & DE Vries, H. 1995. Psychosocial Determinants of Fruit and Vegetable Consumption. *Appetite*, 25(3), 285–296. doi:10.1006/appe.1995.0062
9. Chadwick, R. 2004. Nutrigenomics, individualism and public health. *Proceedings of the Nutrition Society*, 63(1), 161-166.
10. Cheung, L. T., Chan, R. S., Ko, G. T., Lau, E. S., Chow, F. C., & Kong, A. P. 2018. Diet quality is inversely associated with obesity in Chinese adults with type 2 diabetes. *Nutrition journal*, 17(1), 63.
11. Cleveland Clinic, Ohio. 2016. The Psychology of Eating . <https://my.clevelandclinic.org/health/articles/10681-the-psychology-of-eating#:~:text=The%20Psychology%20of%20Eating,eat%20affects%20how%20we%20feel>.
12. Cohen, D. A., & Babey, S. H. 2012. Contextual influences on eating behaviours: heuristic processing and dietary choices. *Obesity Reviews*, 13(9), 766-779.
13. Crichton-Stuart C. 2018. What are some foods to ease your anxiety? <https://www.medicalnewstoday.com/articles/322652>

14. Daniels, S., Glorieux, I., Minnen, J., & van Tienoven, T. P. 2012. More than preparing a meal? Concerning the meanings of home cooking. *Appetite*, 58(3), 1050–1056. doi:10.1016/j.appet.2012.02.040.
15. Mar Bibiloni, M., Pich, J., Pons, A., & Tur, J. A. 2013. Body image and eating patterns among adolescents. *BMC public health*, 13(1), 1104.
16. Department of Health, Australian Government .2019. Food:Overview <https://headtohealth.gov.au/meaningful-life/physical-health/food#:~:text=Eating%20well%20helps%20to%20reduce,as%20how%20much%20you%20eat>.
17. Desmet, P. M., & Schifferstein, H. N. 2008. Sources of positive and negative emotions in food experience. *Appetite*, 50(2-3), 290-301.
18. Epel, E., Jimenez, S., Brownell, K., Stroud, L., Stoney, C., & Niaura, R. A. Y. 2004. Are stress eaters at risk for the metabolic syndrome?. *Annals of the New York Academy of Sciences*, 1032(1), 208-210.
19. Evert, A. B., & Franz, M. J. 2017. Why weight loss maintenance is difficult. *Diabetes Spectrum*, 30(3), 153-156.
20. Fazzino, T. L., Rohde, K., & Sullivan, D. K. 2019. Hyper-Palatable Foods: Development of a Quantitative Definition and Application to the US Food System Database. *Obesity*, 27(11), 1761-1768.
21. Gerster, H. 1991. Potential role of beta-carotene in the prevention of cardiovascular disease. *International journal for vitamin and nutrition research*.
22. Giugliano, D., Ceriello, A., & Esposito, K. 2006. The effects of diet on inflammation: emphasis on the metabolic syndrome. *Journal of the American College of Cardiology*, 48(4), 677-685.
23. Gonzalez, M. & Miranda-Massari, J. 2014. Diet and Stress. *Psychiatric Clinics of North America*. 37. 10.1016/j.psc.2014.08.004.
24. Grant, N., Wardle, J., & Steptoe, A. 2009. The relationship between life satisfaction and health behavior: a cross-cultural analysis of young adults. *International journal of behavioral medicine*, 16(3), 259-268.
25. Greeno, C. G., & Wing, R. R. 1994. Stress-induced eating. *Psychological bulletin*, 115(3), 444.
26. Groesz, L. M., McCoy, S., Carl, J., Saslow, L., Stewart, J., Adler, N. & Epel, E. 2012. What is eating you? Stress and the drive to eat. *Appetite*, 58(2), 717-721.

27. Guo, S. S., Wu, W., Chumlea, W. C., & Roche, A. F. 2002. Predicting overweight and obesity in adulthood from body mass index values in childhood and adolescence. *The American journal of clinical nutrition*, 76(3), 653-658.
28. Gutman, S. A., & Schindler, V. P. 2007. The neurological basis of occupation. *Occupational Therapy International*, 14(2), 71-85.
29. Haas, H. B. 2010. 5 Reasons Why You Can't Control Your Eating. <https://www.psychologytoday.com/us/blog/prescriptions-life/201008/5-reasons-why-you-cant-control-your-eating>
30. Heatherton, T. F., Herman, C. P., & Polivy, J. 1992. Effects of distress on eating: The importance of ego-involvement.
31. Heatherton, T. F., & Polivy, J. 1992. Chronic dieting and eating disorders: a spiral model.
32. Herman, C. P., & Polivy, J. 2004. The self-regulation of eating. *Handbook of self-regulation*, 492-508.
33. Hertog, M. G., Feskens, E. J., Kromhout, D., Hollman, P. C. H., & Katan, M. B. 1993. Dietary antioxidant flavonoids and risk of coronary heart disease: the Zutphen Elderly Study. *The lancet*, 342(8878), 1007-1011.
34. Hibbeln, J. R. 1998. Fish consumption and major depression. *Lancet*, 351(9110), 1213.
35. Huhn, S., Kharabian Masouleh, S., Stumvoll, M., Villringer, A., & Witte, A. V. 2015. Components of a Mediterranean diet and their impact on cognitive functions in aging. *Frontiers in Aging Neuroscience*, 7, 132.
36. Joint WHO/FAO Expert Consultation. 2002. Diet, Nutrition and the Prevention of Chronic Diseases. [https://apps.who.int/iris/bitstream/handle/10665/42665/WHO\\_TRS\\_916.pdf;jsessionid=526FC549B893F70A255859A7AC7DF5D6?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/42665/WHO_TRS_916.pdf;jsessionid=526FC549B893F70A255859A7AC7DF5D6?sequence=1)
37. Kandiah, J., Yake, M., Jones, J., & Meyer, M. 2006. Stress influences appetite and comfort food preferences in college women. *Nutrition Research*, 26(3), 118-123.
38. Kant, A. K. 2000. Consumption of energy-dense, nutrient-poor foods by adult Americans: nutritional and health implications. The third National Health and Nutrition Examination Survey, 1988–1994. *The American journal of clinical nutrition*, 72(4), 929-936.
39. Katz, D. L., Doughty, K., & Ali, A. 2011. Cocoa and chocolate in human health and disease. *Antioxidants & redox signaling*, 15(10), 2779-2811.

40. Kelloniemi, H., Ek, E., & Laitinen, J. 2005. Optimism, dietary habits, body mass index and smoking among young Finnish adults. *Appetite*, 45(2), 169-176.
41. Kiecolt-Glaser, J. K. 2010. Stress, food, and inflammation: psychoneuroimmunology and nutrition at the cutting edge. *Psychosomatic medicine*, 72(4), 365.
42. Kinrys, G., Coleman, E., & Rothstein, E. 2009. Natural remedies for anxiety disorders: potential use and clinical applications. *Depression and anxiety*, 26(3), 259-265.
43. Klesges, R. C., Isbell, T. R., & Klesges, L. M. 1992. Relationship between dietary restraint, energy intake, physical activity, and body weight: a prospective analysis. *Journal of abnormal psychology*, 101(4), 668.
44. Klesges, R. C., Klesges, L. M., Haddock, C. K., & Eck, L. H. 1992. A longitudinal analysis of the impact of dietary intake and physical activity on weight change in adults. *The American journal of clinical nutrition*, 55(4), 818-822.
45. Laura N. 2015. Kitchen Confidential: The Health and Social Benefits of Home-Cooked Meals. <https://www.fix.com/blog/perks-of-home-cooked-meals/#Sources>
46. Lengyel, C. O., Tate, R. B., & Obirek Blatz, A. K. 2009. The relationships between food group consumption, self-rated health, and life satisfaction of community-dwelling canadian older men: the manitoba follow-up study. *Journal of Nutrition for the Elderly*, 28(2), 158-173.
47. Lichtenstein, A. H., Kennedy, E., Barrier, P., & Danford, D. 1998. Dietary fat consumption and health/discussion. *Nutrition reviews*, 56(5), S3.
48. Lim, S. Y., Kim, E. J., Kim, A., Lee, H. J., Choi, H. J., & Yang, S. J. 2016. Nutritional factors affecting mental health. *Clinical Nutrition Research*, 5(3), 143-152.
49. Lisa.2018. Studies show eating homemade is healthier <https://www.dishdivvy.com/2018/01/10/studies-show-eating-homemade-healthier/>
50. Livingstone, K. M., & McNaughton, S. A. 2016. Diet quality is associated with obesity and hypertension in Australian adults: a cross sectional study. *BMC Public Health*, 16(1), 1037.
51. Locher, J. L., Yoels, W.C., Maurer, D. and Ells, J.Y. 2005. Comfort Foods: An Exploratory Journey Into The Social and Emotional Significance of Food. *Food and Foodways*, 13(4) , 273-297.

52. Martin, M. S., Maddocks, E., Chen, Y., Gilman, S. E., & Colman, I. 2016. Food insecurity and mental illness: disproportionate impacts in the context of perceived stress and social isolation. *Public health*, 132, 86-91.
53. McGloin, A. F., Livingstone, M. B. E., Greene, L. C., Webb, S. E., Gibson, J. M. A., Jebb, S. A., & Cole, T. J. 2002. WA Coward<sup>2</sup>, A Wright<sup>2</sup> and AM Prentice<sup>4</sup>. *International Journal of Obesity*, 26, 200-207.
54. McKay, D. L., & Blumberg, J. B. 2006. A review of the bioactivity and potential health benefits of peppermint tea (*Mentha piperita* L.). *Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives*, 20(8), 619-633.
55. Meegan, A. P., Perry, I. J., & Phillips, C. M. 2017. The association between dietary quality and dietary guideline adherence with mental health outcomes in adults: a cross-sectional analysis. *Nutrients*, 9(3), 238.
56. Mental Health Foundation, UK 2017. Food for thought: Mental health and nutrition briefing.
57. Meule, A., & Vögele, C. 2013. The psychology of eating. *Frontiers in psychology*, 4, 215.
58. Mey, J., & Kirwan, J. 2020. A Whole-Grain Diet Improves Whole-Body Protein Turnover Compared to a Macronutrient-Matched Refined-Grain Diet in Adults with Overweight/Obesity. *Current Developments in Nutrition*, 4(Supplement\_2), 1661-1661.
59. Min, M. U., Li-Fa, X. U., Dong, H. U., Jing, W. U., & Ming-Jie, B. A. I. 2017. Dietary patterns and overweight/obesity: a review article. *Iranian journal of public health*, 46(7), 869.
60. Mudambi, S. R. 2007. *Fundamentals of foods, nutrition and diet therapy*. New Age International.
61. Mujcic, R., & J. Oswald, A. 2016. Evolution of well-being and happiness after increases in consumption of fruit and vegetables. *American Journal of Public Health*, 106(8), 1504-1510.
62. Nestle, M., Wing, R., Birch, L., Disogra, L., Drewnowski, A., Middleton, S., Sigman-Grant, M.J., Sobal, J., Winston, M., & Economos, C. 1998. Behavioral and social influences on food choice. *Nutrition reviews*, 56(5) Pt 2, S50-64; discussion S64-74.
63. Ohmori, Y., Ito, H., Morita, A., Deura, K., & Miyachi, M. 2017. Associations between depression and unhealthy behaviours related to metabolic syndrome: a cross sectional study. *Asia pacific journal of clinical nutrition*, 26(1), 130.
64. Oliver, G., & Wardle, J. 1999. Perceived effects of stress on food choice. *Physiology & behavior*, 66(3), 511-515.

65. Oliver, G. & Wardle, J. & Gibson, E. 2000. Stress and Food Choice: A Laboratory Study. *Psychosomatic medicine*. 62. 853-65. 10.1097/00006842-200011000-00016.
66. Opie, R. S., Itsiopoulos, C., Parletta, N., Sanchez-Villegas, A., Akbaraly, T. N., Ruusunen, A., & Jacka, F. N. 2017. Dietary recommendations for the prevention of depression. *Nutritional neuroscience*, 20(3), 161-171.
67. Piqueras, J. A., Kuhne, W., Vera-Villaruel, P., Van Straten, A., & Cuijpers, P. 2011. Happiness and health behaviours in Chilean college students: a cross-sectional survey. *BMC public health*, 11(1), 443.
68. Psychology Today Staff. 2003. Vitamin C: Stress Buster. <https://www.psychologytoday.com/intl/articles/200304/vitamin-c-stress-buster>
69. Rodin, J., Mancuso, J., Granger, J., & Nelbach, E. 1991. Food cravings in relation to body mass index, restraint and estradiol levels: a repeated measures study in healthy women. *Appetite*, 17(3), 177-185.
70. Rooney, C., McKinley, M. C., & Woodside, J. V. 2013. The potential role of fruit and vegetables in aspects of psychological well-being: a review of the literature and future directions. *Proceedings of the Nutrition Society*, 72(4), 420-432.
71. Sánchez-Villegas, A., Delgado-Rodríguez, M., Alonso, A., Schlatter, J, Lahortiga F, Serra Majem L, Martínez-González, M.A. 2009. *Arch Gen Psychiatry*. 66(10):1090-8.
72. Shepherd, R., & Raats, M. 2006. The psychology of food choice, 3.
73. Srivastava, J. K., Shankar, E., & Gupta, S. 2010. Chamomile: a herbal medicine of the past with a bright future. *Molecular medicine reports*, 3(6), 895-901.
74. Stone, A. A., & Brownell, K. D. 1994. The stress–eating paradox: Multiple daily measurements in adult males and females. *Psychology and Health*, 9, 425–436.
75. Stroebele, N., & De Castro, J. M. 2004. Effect of ambience on food intake and food choice. *Nutrition*, 20(9), 821-838.
76. U.S. Department of Health & Human Services (n.d.). Importance of Good Nutrition <https://www.hhs.gov/fitness/eat-healthy/importance-of-good-nutrition/index.html>.
77. Veenhoven, R. 2019. Will Healthy Eating Make You Happier? A research synthesis using an online findings archive. *Applied Research in Quality of Life*, 1-20.



78. Vögele, C., Lutz, A. P., & Gibson, E. L. 2017. Mood, Emotions, and Eating Disorders.
79. Vögele, C., and Gibson, L. 2010. "Mood, emotions and eating disorders," in Oxford Handbook of Eating Disorders. Series: Oxford Library of Psychology. Oxford University Press.
80. Wattick, R. A., Hagedorn, R. L., & Olfert, M. D. 2018. Relationship between diet and mental health in a young adult appalachian college population. *Nutrients*, 10(8), 957.
81. Weingarten, H. P., & Elston, D. 1991. Food cravings in a college population. *Appetite*, 17(3), 167-175.
82. Weinstein, S. E., Shide, D. J., & Rolls, B. J. 1997. Changes in food intake in response to stress in men and women: psychological factors. *Appetite*, 28(1), 7-18.
83. Willenbring, M. L., Levine, A. S., & Morley, J. E. 1986. Stress induced eating and food preference in humans: a pilot study. *International Journal of Eating Disorders*, 5(5), 855-864.
84. Wongvibulsin S. 2014. Eat Right, Drink Well, Stress Less: Stress-Reducing Foods, Herbal Supplements, and Teas <https://exploreim.ucla.edu/nutrition/eat-right-drink-well-stress-less-stress-reducing-foods-herbal-supplements-and-teas/#:~:text=Vitamin%20C%3A%20Consuming%20foods%20high,presure%20during%20high%2Danxiety%20situations.>
85. Zakeri, I., & Berenson, G. 2004. Changes in Food Group Consumption Patterns from Childhood to Young Adulthood: The Bogalusa Heart Study. *J Am Diet Assoc*, 104, 1684-1691.
86. Zellner, D. A., Loaiza, S., Gonzalez, Z., Pita, J., Morales, J., Pecora, D., & Wolf, A. 2006. Food selection changes under stress. *Physiology & behavior*, 87(4), 789-793.

**Appendix 1: Survey questionnaire with responses of the sample population**

Sr. no.	Question	Gender	Responses					
			Yes	%	No	%	Maybe	%
1	Food material is easily available during lockdown.	Male	363	41.96	24	40.67	31	35.63
		Female	502	58.03	35	59.32	56	64.36
		Total	865	85.55	59	05.83	87	08.60
2	Food helps in relieving stress during lockdown.	Male	275	41.72	39	39.79	104	40.94
		Female	384	58.27	59	60.21	150	59.05
		Total	659	65.18	98	09.69	254	25.12
3	I have focused more on healthy eating during lockdown.	Male	318	42.45	40	37.73	60	38.46
		Female	431	57.54	66	62.26	96	61.53
		Total	749	74.08	106	10.48	156	15.43
4	Controlling the food amount has become difficult during lockdown.	Male	102	38.63	252	44.05	64	36.57
		Female	162	61.36	320	55.94	111	63.42
		Total	264	26.11	572	56.57	175	17.3
5	I have taken interest in cooking food during lockdown	Male	217	34.01	176	66.16	45	42.05
		Female	421	65.98	90	33.83	62	57.94
		Total	638	63.1	266	26.31	107	09.63
6	I have reduced food intake during lockdown.	Male	136	46.73	245	40.16	37	33.63
		Female	155	53.26	365	59.83	73	66.36
		Total	291	28.78	610	60.33	110	10.88
7	I have gained weight due to eating more food during lockdown.	Male	97	45.97	251	38.49	57	38.51
		Female	114	54.02	401	61.50	91	61.48
		Total	211	20.87	652	64.49	148	14.63
8	I have lost my weight during lockdown.	Male	114	44.01	248	39.74	52	40.62

		Female	145	55.98	376	60.25	76	59.37
		Total	259	25.61	624	61.72	128	12.66
9	During lockdown, I have tried making new type of food that I have not tried before.	Male	203	30.52	188	84.68	27	21.77
		Female	462	69.47	34	15.31	97	78.22
		Total	665	65.77	222	21.95	124	12.26
10	Making food makes me happy during lockdown.	Male	177	30.30	145	61.96	83	43.00
		Female	407	69.69	89	38.03	110	56.99
		Total	584	57.76	234	23.14	193	19.09
11	Eating food makes me happy during lockdown.	Male	255	40.93	63	49.90	100	42.73
		Female	368	59.06	91	59.09	134	57.26
		Total	623	61.62	154	15.23	234	23.14
12	Making food is a difficult task.	Male	138	49.81	191	33.92	84	49.12
		Female	139	50.18	372	66.07	87	50.87
		Total	277	27.39	563	55.68	171	16.91
13	I enjoy eating different types of food during lockdown.	Male	290	39.50	81	50.31	47	40.51
		Female	444	60.49	80	49.68	69	59.48
		Total	734	72.60	161	15.92	116	11.47
14	I have provided food to needy people during lockdown.	Male	147	28.88	221	58.46	50	40.32
		Female	362	71.11	157	41.53	74	59.67
		Total	509	50.34	378	37.38	124	12.26
15	During lockdown, I have searched more about food on internet.	Male	153	29.31	221	57.25	44	42.71
		Female	369	70.68	165	42.74	59	57.28
		Total	522	51.63	386	38.18	103	10.18
16	I preferred to gain information on healthy diet on internet during lockdown.	Male	223	38.18	153	51.00	42	33.07
		Female	361	61.81	147	49.00	85	66.92
		Total	584	57.76	300	29.67	127	12.56

17	Do you feel better after eating home prepared food due to lockdown?	Male	371	40.59	22	53.65	25	44.64
		Female	543	59.40	19	46.34	31	55.35
		Total	914	90.40	41	4.05	56	5.53
18	Are you able to fulfil your food choice during lockdown?	Male	299	41.29	51	41.46	68	41.46
		Female	425	58.70	72	58.53	96	58.53
		Total	724	71.61	123	12.16	164	16.22
19	Are you able to maintain food hygienic during lockdown?	Male	373	39.89	6	60	39	59.09
		Female	562	60.10	4	40	27	40.90
		Total	935	92.48	10	0.98	66	06.52
20	Do you feel physically healthy during lockdown?	Male	352	42.25	32	44.44	34	32.07
		Female	481	57.74	40	55.55	72	67.92
		Total	833	82.39	72	7.12	106	10.48