

## Mental Stress and Food we eat

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Mental disorders affect everyone, irrespective of age, gender, residence, and living standards, and even though some groups are at a higher risk for certain illnesses; only the impact varies. At a global level, over 564 million people are estimated to suffer from depression and anxiety, equivalent to 8.0% of the world's population. Both depression and anxiety disorders are more common among females than males (4.6% compared to 2.6% at the global level).<sup>[1]</sup>

National mental health survey 2015-16 implemented by the National Institute of Mental Health and Neuro-Sciences (NIMHANS) Bengaluru put the figures of 1 in 20 people in India suffer from depression. The high prevalence of moderate and high dependence tobacco use and alcohol abuse was 20.9% and 4.6%, respectively. These are not the isolated scenario as mental disorders are caused by a complex interaction of biological, social, environmental, cultural, and economic factors. One of the complex interaction is food and nutrition.<sup>[2]</sup>

### Why link mental stress with food:

Most of the world's population live in countries where overweight (global prevalence 39%) and obesity (13%) kills more people than underweight. Unfortunately, we are now 8 months into the COVID-19 pandemic, and the end of the crisis is nowhere near, a different domain of public health requires urgent attention.

Additionally, there are major shifts in dietary intakes globally, with a substantial increase in the consumption of sugars, snack foods, take-away foods, and high-energy foods. At the same time, the intake of whole-grain fiber-rich nutritious foods is diminishing. These changes are particularly obvious in the younger and working population. Indeed, the latest data from the Global Burden of Disease Study found that an unhealthy diet is now the leading cause of early death.

The type and quality of the food we eat, affect our mental health. And any mental illness may affect the type and pattern of our eating.

What is the mechanism of this interaction?

The mental stress of any cause will activate the neuroendocrine hypothalamic-pituitary-adrenal (HPA) axis resulting in increased glucocorticoid and insulin synthesis to

fuel the metabolic demands of other physiological and behavioral stress responses. Both hormones are anabolic and they regulate the accumulation and storage of body fat and can increase appetite, food intake, and sense of good feeling.<sup>[3]</sup>

Secondly, there is we can call a little brain, "the enteric nervous system (ENS)" of 100 million nerve cells lining your gastrointestinal tract from the esophagus to the rectum. The bidirectional communication between the brain and gut microbiota is referred to as the gut-brain-axis. The microbiota is defined as all microorganisms in a particular location, such as the GI tract or skin. The healthy gut function has been linked to the normal central nervous system (CNS) function. Hormones, neurotransmitters, and immunological factors released from the gut are known to send signals to the brain either directly or via autonomic neurons. Recently, research has highlighted the effect of variations in the microbiome on various CNS disorders, including anxiety, depressive disorders, schizophrenia, and autism<sup>[2]</sup>. When there are changes in diet, stress, or antibiotics, the physiology of the normal microbiome undergoes a change which may result in the release of various inflammatory cytokines causing mood changes.

### Why we are worried:

Acute and chronic exposure to stress influences both the amount and types of food for most people. For example, approximately 35–60% of people report eating more total calories when they are experiencing stress, whereas approximately 25–40% of people report eating less. Additionally, many people eat highly-palatable foods (i.e., tasty, calorically-dense foods containing high amounts of sugars, other carbohydrates, and/or fats), and this change in the type of food they eat, can even occur in many people that reduce their total caloric intake during stress. This is often referred to as eating 'comfort food' - that palatable food intake reduces stress responses, providing a natural means for most people to 'self-medicate' for stress relief.<sup>[3]</sup>

This emotional eating has a short term effect of decreasing stress-related negative affect. However, in the long-term using the strategy of 'emotional eating' in particular in obese persons, often instills feelings of guilt and self-anger, thereby intensifying the existing negative emotions. Even more important, emotional eating will not solve the actual stress.<sup>[4]</sup>

In the long run, excessive consumption of palatable foods during stress may lead to obesity and its associated complications. Obesity can heighten vulnerability to depression and anxiety. Results from a systematic review found a bidirectional association between depression and obesity that people who were obese had a 55% increased risk of developing depression over time, whereas people experiencing depression had a 58% increased risk of becoming obese. Whereas 1 in 3 people with diabetes is estimated to experience depressed mood. All this resulting in impairing quality of life and everyday functioning along with additional threats poor compliance to treatment and lifestyle changes and increasing the risk of complications associated with metabolic diseases.<sup>[3]</sup>

The nexus of mental stress with unhealthy food is present across all age groups from childhood to elderly people. Above this, there is another concern related to eating motives. A review by De Vriendt et al. (2009) found that stress is specifically associated with increased appetite particularly in adolescents, which can be seen as a desire for food. Therefore, a distinction should be made between 'hunger eating motives' (=eating out of hunger) and 'desire to eat motives' (=eating out of a desire to eat; eating out of a craving for food), with the latter defined as a rather unhealthy eating which is important in obese children.<sup>[4]</sup>

What is the solution?

Food is an integral part of the sociocultural environment of a community and choice and type of foods varies on festivals, feasts, and during fasting. This needs a cultural shift towards a healthier choice of foods and the way we deal with stresses.

It is well-established fact that for a healthy life we require an adequate and balanced diet consisting of all macro and micronutrients (minerals and vitamins) along with antioxidants and pre and probiotics. The solution lies in adopting the "traditional" diets, like the traditional vegetarian Indian diet, Mediterranean diet, or the traditional Japanese diet, to a typical "Western" diet. Scientists account for this difference because these traditional diets tend to be high in vegetables, fruits, unprocessed grains, and fish and seafood, and to contain only modest amounts of lean meats and dairy. They are also void of processed and refined foods and sugars, which are staples of the "Western" dietary pattern. Besides, many of these unprocessed foods are fermented, and therefore act as natural probiotics. The gut microbiota helps in the absorption of phenolic metabolites from dietary polyphenols whose multiple beneficial properties have known therapeutic efficacy against depression.<sup>[5]</sup>

It also needs a social behavioral change of the society itself because food choices of unhealthy energy-dense fatty foods are dictated by cultural or status norms in parties, festivals, and feasts. This can only be possible when the whole of society is addressed by behavioral change communication in stepwise systemic ways.

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