

# Management of stress through nutrition

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## ABSTRACT

**Background:** We all, once in our life face stress though how we handle it can make all the difference. Stress creates greater physiological demands. More energy, oxygen, circulation, and therefore more metabolic cofactors are needed e.g. vitamins and minerals. **Aims:** To explore about the importance of diet and its relation to manage stress. **Methods:** This paper is based on a narrative review of existing literature, including peer-reviewed articles and reports related to stress and nutrition. **Conclusion:** Stress not only influences the choice of food of a person but also the quantity of the food eaten. Stress can be managed well with the help of a nutritious and well-balanced diet. It is a powerful therapeutic tool to reduce stress as well as benefits that improve brain functioning, shore up immune function, lower blood pressure, improve the circulation, and reduce toxins from the body. There are complex carbohydrates, proteins (tryptophan, phenylalanine and tyrosine, theanine) Vitamin C, Vitamin B, Magnesium, and Selenium. These nutrients play a very specific and important role in stress management.

**Keywords:** Stress, Nutrition, Immunity, Hormones, Health.

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## INTRODUCTION

Stress is the body's natural reaction to any demand or pressure, whether physical, mental, or emotional. It's a response to perceived threats or challenges, triggering a physiological and psychological reaction to prepare the body for action, much like a fight or flight response. Short-term stress can be motivating, while prolonged or intense stress can negatively impact to physical and mental well-being. Nutrition is the intake of food, considered in relation to the body's dietary needs and well-balanced diet combined with regular physical activity – is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity. (WHO,2023) The irony of stress is that people suffering stress need a more nutritionally dense diet but often opt for comfort foods (like sugary and fatty foods) lacking in the necessary nutrients, consequently inducing a situation of nutrient depletion that further compromises the metabolic systems.

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## STRESS AND NUTRITION:

Stress and nutrition have always been linked. It is possible that someone eating a healthy, balanced diet is going to be far less stressed than someone eating a Unhealthy diet. If we are feeling overly

stressed, our digestive system is probably under a great deal of strain, and the central nervous system immediately shuts down digestion - restricting blood flow, slowing the contractions of the digestive muscles and decreasing secretions needed for digestion. Some specific nutrients play a very important role in reducing the levels of cortisol and adrenalin in the body and also the stress chemicals that activate fight and flight response (Singh,2016)

#### **Effect of stress on nutrition:**

Stress impacts on healthy eating habits and lifestyle. Busy and poor lifestyle multiplies the stress which makes the body crave foods that are high in fats and sugars. People having stress due to busy schedule and have no time to balanced their nutrition. Poor eating habits precipitate other physical as well as mental health problems. some Unhealthy eating habits are:--**(a) Eating the Wrong Food Types:** Due to stress, cortisol levels get high which also lead to crave foods that are high in fats and sugars. **(b) Constantly Picking at Food:** Under stress, a person will eat when they are not even hungry and constantly pick at fatty and sugary snacks. These unhealthy practices during stress Stress and behavioral changes during stress management and invite serious health issues. **(c) Fast Food:** Now a days it is common to have fast food and convenience because of fast- paced lifestyle and social influences, which also hindrances money as well as physical and mental health. **(d) Forgetting/Skipping Meals** people with stress either overeat go for fast food or skip meals or forget to take meals, which make them more prone to stress and depression. **(e) Fad Dieting:** due to stress cortisol production increased which results overeating of fatty and sugary foods and causes weight gain, when people try to lose weight quick by either going on fad diets, or cutting out food entirely. The results may look good in the short run, but in the long term body will suffer lack of vital nutrients.

These poor eating habits effects nutritional status of an individual It can also lead to overall heath change (due to unhealthy eating habbit)

#### **Negative Hormonal Side Effects:**

Poor eating habits also have a massive impact on the hormones in body. The following hormones are increased under the influence of poor eating habits: (A) Adenosine - Alerts but resultant sleep problems in the future.(B) Adrenaline - Gives an extra boost but when it has worn off causes tired.(C) Cortisol - The Stress hormone. Makes crave fatty foods. (D) Dopamine - Initially makes the person feel good but once worn off, generates a low and possible dependence/addiction.

**Weight Issues:** the amount of cortisol produced by stress gives the person a strong urge to divulge in foods that are high in carbohydrates, sugars and fats, result in excess fat being stored around the upper half of individual body (mainly the abdomen). Abdomen fat can lead to serious health problems, mainly concerning the heart. If stress persists this will worsen the problem and difficult to lose weight.

**Poor Health and Immune System:** Under stress, the body's natural defences can be severely affected and leave the person with a weaker immune system. This leaves the person more prone to contracting illnesses.

**Imbalances in the Blood Sugar:** When someone stressed does not eat the right amount of food or the correct amount of nutrients, may be skip meals results blood sugar remains inconsistencies and this will cause Tiredness, Lapses of concentration, Mood swings etc. If stress is not deal properly in the short term, the body will suffer in the long term with blood sugar problems that are much more serious, such as diabetes.

When stress occurs, a well-balanced nutrition will boost our resistance against the effects that stress brings upon the body. It is important to recognize that when under stress, the nutrients that we have consumed will be drained at a much quicker rate than they are normally.

Therefore it is important to constantly top up on vital nutrients. The first thing a body tries to do after the initial (alarm) stage of stress is respond to the situation. Under the influence of stress, the body craves foods/drinks that maintain stress levels in the body. Such examples include sweets, caffeine and smoking. There are nutrients which will assist individual in keeping person body's natural defences up and make body more resistant to stress.

**Important Nutrients for Stress Management: (A) Complex carbohydrates-** Eating whole, unprocessed carbohydrates such as wholegrain cereals, and millets, as well as oats and brown rice help to enhance levels of serotonin - the mood-boosting hormone that helps to feel happy and more relaxed. Low levels of serotonin in the body are linked to anxiety and depression, as well as poor quality sleep, so keeping this hormone in balance is key for dealing with stress. Additionally, complex carbohydrates are digested more slowly than refined, processed varieties, which can help stabilize blood sugars. Complex carbohydrates also contribute to fiber which helps to maintain good stomach and digestive functioning. It makes the food stay longer in stomach hence the more slowly the body absorbs carbohydrate, the more steadily serotonin flows. (Heninger et al 1996) .

**(B) Proteins:** Tryptophan is an amino acid found in milk as well as in many proteins' rich foods like whole grains. Serotonin is synthesized from Tryptophan. Tryptophan works with vitamin B6, niacin and magnesium to synthesize serotonin. If too little tryptophan is available for the brain, then it may limit the amount of serotonin. To make tryptophan more effective, make them high in complex carbohydrates. Carbohydrate makes tryptophan more available in the brain. Phenylalanine and tyrosine: Phenylalanine and tyrosine promote alertness and vitality. To effectively metabolize these amino acids we need Vitamin C. Tofu, dairy products, bananas, avocados, beans, pumpkin seeds, sesame seeds and almonds are the main sources of phenylalanine and tyrosine. Combining with vitamin c rich sources.

(C)

**Theanine :** Theanine has been studied for its potential ability to reduce mental and physical stress, improve cognition, and boost mood and relaxes the brain. However, this effect has only been established at higher doses than that typically found in a cup of black tea (approximately 20 mg). Tea is a good source of theanine. (Kimura et al 2007). **(D) Omega 3 fatty acids :** The brain needs omega 3 fatty acids for the formation of healthy nerve cells. Good level of omega 3 fatty acids lower the risk of stress. Essential fatty acids (Omega 3 and 6) are vital nutrients, which help the body to function effectively - particularly the brain. EFAs also help to moderate the effects of psychological and physical stress. To balance of EFAs in a person diet, eat oily fish such as salmon, sardines, and, herring as well as flax seeds, walnuts and pumpkin seeds, olives. **(E) Vitamin C:** Vitamin C helps to recover more quickly from emotional and physical stress, which may otherwise weaken adrenal glands and increase fatigue. Vitamins C and E (both antioxidants) reduced liver damage caused by psychological stress. Brody et al. concluded that those who received vitamin C supplements experienced less stage fright and showed a faster recovery of cortisol levels indicating that the adrenal glands, which produce cortisol, the stress hormone, were functioning better. **(F) Vitamin B:** The B-vitamins function in the development and maintenance of the nervous system. The harmful effects of vitamin- B-deficiencies on the nervous system might increase the risk of developing stress-related symptoms such as irritability, lethargy and stress. Among B-vitamins, most important is vitamin B5 (pantothenic acid) which is often called anti-stress vitamin B5 helps support the adrenal glands and improves coping mechanisms. (Calderón-Ospina & Nava-Mesa, 2020). One of the B vitamins is folic acid which is believed to relieve stress, anxiety, panic and even depression. Folic acid deficiencies have been found to contribute to mental illness.

**Folic acid** is present in kidney beans, whole meal bread, broccoli, dark green cabbage, peanuts, peas, egg yolks and green leafy vegetables. (Zhao et al 2011). **Niacin** deficiency of niacin causes skin and mucous membrane disorders as well as depression and confusion. This can be cured by feeding niacin or by feeding the essential amino acid tryptophan from which niacin can be made in the body. Good

sources of this vitamin are yeast, meat, fish, poultry, peanuts, legumes and whole grain cereals etc. Potter & Hotchkiss (2006) . **(G) Magnesium:** Magnesium is helpful in variety of tasks such as muscle relaxation, fatty acid formation, making new cells and heartbeat regulation. **(H) Calcium:** Research into stress and diet shows that calcium may be able to help reduce certain symptoms, such as muscle tension and anxiety. Therefore, including plenty of calcium-rich foods in your diet (such as low-fat milk, yoghurt, sesame seeds, kelp, cheese, leafy greens and broccoli) may be beneficial. Eating these in the latter part of the day is thought to help with absorption. Ensuring adequate calcium intake may serve as a potential intervention for improving mental health, given the biological functions of calcium in the nervous system. Calcium regulates neurotransmitter synthesis and release. (Marambaud et al 2009), which play important roles in neuronal activation and mood regulation (Pal, 2021) . Additionally, calcium is required to produce serotonin, which is the precursor of melatonin (Nongonierna et al, 2015). Melatonin is important in regulating sleep cycles (Zisapel, 2018) and sleep plays a fundamental role in maintaining emotional health (Barclay & Gregory, 2013). Given that dairy products provide a good or excellent source of bioavailable calcium (Klobukowski et al 2014), promoting dairy intake may improve certain indicators of mental health. **(I) Selenium:** Selenium is a mineral involved in the reactions which release energy from cells. Its deficiency may cause fatigue. Brazil nuts and also whole grains (if grown in selenium rich soil) are rich in selenium content. Adequate supply of vitamin E increases the effectiveness of selenium. Selenium has an impact on the function of the adrenal glands. Research shows that deficiencies of selenium can have a negative effect on adrenal function. (Wilborn et al 2004). In order to consume these nutrients, a person needs to adopt a particular defined eating plan or diet. Following a strict plan and including some foods that will strengthen the body against stress and other illnesses.

**Stress-busting foods:** Foods can elicit an emotional response when eaten. Foods can help tame stress in several ways. Comfort foods, like a bowl of **warm oatmeal**, boost levels of serotonin, a calming brain chemical. Other foods can cut levels of cortisol and adrenaline, stress hormones that take a toll on the body over time. A healthy diet can help counter the impact of stress by shoring up the immune system and lowering blood pressure.

**Whole grains** are the rich source of carbohydrates. Carbohydrates are used as a comfort food because it makes a chemical (serotonin) that comforts a person. Carbohydrates cause the body to make insulin, which allows tryptophan (precursor of serotonin) to get into the brain. Serotonin is considered to be the brain's natural "feel good" chemical and appetite suppressant. Complex carbohydrates take longer time to get digested and, therefore, keep a person calm for longer period of time. Complex carbohydrates also stabilizing blood sugar level. **Oranges:** are rich source of vitamin C stressed body are more prone to free radical formations. Vitamin C helps to keep free radicals in check and repairs the body. Basically, it helps protect the body from the cumulative effects of stress. Also vitamin C lowers blood pressure and stress hormone cortisol. Orange juice contains folic acid which helps to relieve stress. Drinking orange juice helps in production of dopamine in the body and make the person feel relaxation. **Broccoli:** One of the good mood foods is broccoli which has stress relieving vitamin B6. It also contains folic acid which is important in fighting depression.

**Banana:** creates long-lasting energy to help in prevention of blood sugar imbalance. Carbohydrates aid in the absorption of tryptophan in the brain, Vitamin B6 helps in conversion of tryptophan into mood-lifting serotonin and the potassium and iron work towards off fatigue by producing more energy. Iron in bananas exclusively is crucial to producing energy and fighting fatigue. **Spinach:** is considered to be a magic cocktail of all the greens and is one of the richest food sources of folic acid. Being a rich source of folate and magnesium, it helps to lower stress level by keeping a person in a calm state and by preventing blood pressure from spiking. Dark leafy greens like spinach are rich in folate, which helps person body produce mood-regulating neurotransmitters, including serotonin and dopamine. Jussi et al, 2012 study found people who consumed the most folate had a lower risk of depression than those who ate the least. Consuming **Dark chocolate** reduces stress in two ways-its chemical impact and its emotional impact. Chocolate not only plays a role in fighting off free radicals, but it can affect both mind and mood. it is a complex material, possessing numerous compounds that act upon the brain, producing a sense of delight that no other substance can replicate. Cocoa beans are also one of the nature's most concentrated sources of the bromine,



a molecular caffeine and theophylline, present in coffee and tea. Theobromine has been proved to be safe for human consumption. Chocolate's serotonin elevating activity helps to modify mood in positive way and commonly known as a comfort food.

**Cocoa butter** is high in antioxidants, beneficial in lowering cholesterol level, boosting blood flow, reducing hypertension and also a good source of minerals. Phenyl ethyl amine (PEA) present in cocoa increases the activity of neurotransmitters. **Cocoa beans** contain nutrients essential to human mental and physical health such as iron, magnesium, potassium, phosphorus, zinc and polyphenols mainly flavonoids. **Green tea:** contains L-theanine a protein which relaxes the brain, and reduce stress and anxiety, Consumption of 50 mg of L-theanine (equivalent to two-three cups of tea) has shown to stimulate the alpha-brain waves. The beta-brain waves are associated with reduction of tension. We can also include herbal tea as a stress buster. **Flaxseeds:** Flax seeds is a good food choice by vegetarians and good brain food. It has a warm, earthy and subtly nutty flavor combined with an abundance of omega 3 fatty acids. Flaxseeds are rich in alpha linolenic acid (ALA), an omega 3 fatty acid. (Amit et al 2014).

**Caffeine :** Epidemiological and experimental studies have shown positive effects of regular coffee-drinkers on various aspects of health, such as psychoactive responses (alertness, mood change etc.). Caffeine, an alkaloid, is the most widely consumed stimulant of coffee. Caffeine is beneficial to overall health of human beings. It stimulates the central nervous system and flow of blood in the brain and increases the secretion of serotonin. Caffeine enhances alertness, facilitates thought formation and decreases fatigue. This alkaloid also improves mood, lifts the spirits and enhances both cardiovascular function and respiration. Taken by adults at a dose of 300 mg/day or less, caffeine is safe and beneficial for human health. White JV, Reeves RS (2008).

**Almonds:** Almonds are packed with B and E vitamins, which help boost the immune system. **Walnuts:** Walnuts have long been thought of as a 'brain food' because of their wrinkled, bi-lobed (brain like) appearance. They are an excellent source of omega 3 essential fatty acids and uridine. The combination of omega 3 fatty acids and uridine is thought to be a natural antidepressant. Walnuts also contain some other compounds like vitamin B6,

tryptophan, protein, and folic acid which contribute to stress releasing. Thakur (2013). **Pistachios:** Pistachios are good sources of healthy fats. Eating a handful of pistachios protect you against the effects of stress. Don't overdo it, though: Nuts are rich in calories. One study found eating

two servings of pistachios a day lowered vascular constriction during stress, which means the load on your heart is reduced since your arteries are more dilated.

**Milk :** Another bedtime stress buster is the glass of warm milk. Research shows that calcium eases anxiety and mood swings. Skim or low-fat milk recommend. Probiotics: Probiotic increase the good bacteria, reducing the bad bacteria, improving barrier function and gut motility. These bacteria have the potential to alter brain neurochemistry and treat anxiety and stress-related disorders. Stress can cause various gastrointestinal discomforts like cramping, abdominal bloating, diarrhoea or constipation. All of these symptoms can be controlled by the use of probiotics.

**Fish & Eggs:** Fish like Mackerel, Salmon, tuna, sardines contain omega 3 fatty acids which boost the levels of serotonin, a neurotransmitter for good mood. It also has stress fighters like B6 and B12. These are important for the optimum functioning of the brain and enhance memory and mood. **Eggs** Full of high-quality protein and omega 3 fatty acids. Eggs are also an excellent source of vitamin B12 and a good source of vitamins B2, B5, and vitamin D. One boiled egg also contains more than 20 percent of the daily recommended amount of tryptophan hence considered a good stress busting food. It is also easy to available snack.

Stress is a common problem that we all have to deal with in our lives, some more than others. There are many factors that bring stress upon the human body, in the surroundings and day to day life. The food a person consumes as part of their daily lifestyle can be utilized as a tool to overcome or to reduce the effect of stress on the body. Unhealthy eating patterns will only result in an increased level in stress, followed by further problems in the future if not resolved. One of the key ingredients to good health, and probably most important is having a well-balanced nutritional eating plan. A balanced nutrition plays an important role when we are under stress. When stress occurs, a well-balanced

nutrition and good mood food will boost our resistance against the effects that stress brings upon the body.(Singh,K 2016)

## CONCLUSION

Stress is a diverse, complex phenomenon with various components initiating the triggering events and processing the brain to response. The responses may be emotional, biological or physical which varies from individual to individual because of both genetic and environmental factors and it often affects eating behaviour. The stress response is an adaptive mechanism. The balanced diet as a tool to overcome or to reduce the effect of stress on the body. One of the key ingredients to good health, a balanced nutrition plays an important role when we are under stress. When stress occurs, a well-balanced nutrition and good mood food will boost our resistance against the effects that stress brings upon the body. Thus, to keep the body and mind healthy, every individual should know the stress management and nutrition play a key role in stress management.

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