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**Dr. Dilepkumar S Navale**

UGC Senior Research Fellow

Dept. of Studies and Research in

Psychology Gulbarga University

Kalaburagi Karnatak, India

## The impact of stress on health and performance

**Dr. Dilepkumar S Navale**

### Abstract

The present study investigates impact of stress on health performance its impact. When hormones are produced in a manner such as those associated with psychological chronic stress they produce several negative effects according to research. Interestingly appropriate exercise can, to a certain extent, actually minimize all of the negative effects of stress when applied in a healthy program. In the right amount, stress helps you prepare, focus, and perform at your optimal level. Conversely, too much stress, or bad stress, can cause performance anxiety, which hurts your health and does not allow you to play relaxed, confident, and focused in competition. Some stress is good for you. While too little stress can lead to boredom and depression, too much can cause anxiety and poor health. The right amount of acute stress, however, tunes up the brain and improves performance and health. A person's response to the stress of physical illness varies tremendously and in large part depends on his or her own personality style and social supports. It is known, for example, that certain diseases such as diabetes, rheumatoid arthritis, peptic ulcer disease, or cardiac disease can worsen with mental stress.

**Keywords:** Stress on health and performance

### Introduction

Most people recognize that stress is not healthy but most fail to realize the significant impact stress can have on both physiological and psychological well-being. Estimates vary, but experts believe about 70% of doctor visits and 80% of serious illnesses may be exacerbated or linked to stress. Whether it is an acute bout of frustration, as experienced when cut off in traffic, or a major life event such as a divorce, losing one's job, or being diagnosed with a disease, stress can negatively affect all systems of the human body. Interestingly, even though stress is an innate response it varies by person. Stress is heavily rooted in perception; one individual's unpleasant experience can be another's enjoyable undertaking. Essentially, stress can produce positive or negative metabolic and hormonal responses based on the internal environment and the balance maintained between the stress itself and recovery measures to attenuate its response (e.g., proper nutrition, sleep, and stress management techniques). Adequate stress, whether physical or mental, is needed to promote adaptations in a bodily system; while excessive stress results in systemic breakdown. Eustress is the term utilized to describe appropriate stress routinely applied for the provision of positive adaptive outcomes; distress describes an excessive level of stress that promotes negative outcomes.

### Psychological outcomes

The hormones released during an acute or chronic stress response ultimately dictate the outcome. The reaction to an acute stress, commonly known as the "fight or flight" response, involves the rapid release of adrenal hormones to increase immediately available energy (i.e., blood sugar) via the breakdown and liberation of glycogen from the liver as well as triglycerides and amino acids. Blood pressure also increases in an acute fashion. This mechanism is meant to protect or ready the human body for changes in movement intensity; the hormonally-liberated energy will help the individual confront the given stress, or flee from it. This action is driven by the hypothalamus, an area of the brain that can send neurotransmitters programmed to promote excitation to the adrenal glands. At the basic level the acute response ensured primitive human survival in varied environments; in modern society, safety and intensity are much more controlled.

### Correspondence

**Dr. Dilepkumar S Navale**

UGC Senior Research Fellow

Dept. of Studies and Research in

Psychology Gulbarga University

Kalaburagi Karnatak, India

Therefore, most of the time we see the response occurring in a more chronic fashion such as worrying about uncontrollable, upcoming issues or challenges such as an exam, potential layoff, or financial uncertainty. This constant liberation of adrenal hormones creates a saturated hormonal milieu. The available energy is not consumed and there is no stimulus that employs the benefits of the sympathetic hormones. Cortisol and epinephrine are useful during exercise but consequential when produced without physical activity such as during the situations just described. When hormones are produced in a manner such as those associated with psychological chronic stress they produce several negative effects according to research. Interestingly appropriate exercise can, to a certain extent, actually minimize all of the negative effects of stress when applied in a healthy program.

### Major Psychological implications

- **Risk for a heart attack or stroke** - The explicit relationship between stress and the risk for a heart attack or stroke is not conclusive, but evidence continues to increase. For example, a recent study including 200,000 employees in Europe found that people who had more stressful jobs and little decision-making power at work (e.g., service-based roles such as servers) were 23% more likely to suffer a heart attack compared with others with relatively minimal job-related stress and control over their daily decisions. In another recent study, healthy adults who had experienced a stressful life event within the past year were 400% more likely to suffer a stroke than their less-stressed counterparts. This increase in risk is believed to be primarily associated with stress-related increases in blood pressure and the consequent progression of atherosclerosis due to endothelial damage.
- **Blood pressure issues** - A stressful situation can cause a temporary spike in blood pressure due to the actions of adrenal hormones that constrict vascular structures and increase the heart rate; but these effects dissipate when the stress has passed. Research has not clearly demonstrated that chronic stress causes a permanent change in resting blood pressure measures, but a long-term alteration in the hormonal environment (chronic anxiety) may be able to produce longer-lasting variations in blood pressure measures. A more casual relationship may be the concern. Chronic stress increases central adiposity which increases blood pressure – essentially the bigger you become the higher the blood pressure.
- **Blood sugar issues** - Acute stress clearly raises blood sugar as described previously, so diabetic individuals may experience relatively dangerous variations in blood glucose (especially hyperglycemia) following an acute bout of extreme stress. One related study including obese black women without diabetes found that those who produced more epinephrine while recalling stressful life events experienced elevated fasting glucose measures and more significant spikes in blood glucose than those with lower epinephrine responses, suggesting a connection between stress and glucose mismanagement.
- **Pregnancy-related issues** - Normal quantities of stress are not likely to have a significant impact on a pregnant woman or the unborn child, even though the fetus is exposed to all hormones released by the mother, but severe stress, such as going through a divorce, has been shown to increase the risk for premature labor. Several studies have even suggested that extremely high levels of stress can affect the fetus's brain development. Prenatal

yoga and other stress-reduction techniques may be useful, but a primary physician should be consulted to ensure these activities are safe for the mother. On a related note, stress may even influence a woman's ability to get pregnant in the first place. One investigation showed women with the highest levels of alpha-amylase, a salivary biomarker for stress, had a 12% reduction in their chance of getting pregnant during a given cycle, compared with those with the lowest concentrations.

- **Asthma** - Stress seems to exacerbate asthma and other pulmonary disorders. In one study, children who experienced severe stress, such as the death of a loved one, had an approximate 200% increase in the risk of an asthma attack over the following two weeks, compared to those not under significant stress. The connection is not yet completely clear, but research seems to suggest that significant stress may amplify the immune response to asthma triggers such as pollen, severe cold, animal dander, or dust.
- **Clinical eating disorders** - One of the major causative factors behind clinical eating disorders such as anorexia nervosa and bulimia nervosa is extreme anxiety and psychological stress associated with "control issues"; the individual feels that food and/or exercise is one of the only controllable factors in their life. Negative behaviors associated with eating disorders are primarily derived from an unnatural preoccupation with body image and fatness coupled with the mental distress of low self-esteem and severe self-criticism.
- **Weight gain** - While acute stress reduces appetite, chronic stress can have an impact on both circulating hormones and the brain's feeding center. Chronic stress promotes an increased risk for increased central adiposity and hyperphagia; essentially chronic overeating due to gut hormone activity.
- **Other physical and mental problems**
- **Digestive issues** - Heartburn, stomach cramping, constipation, and diarrhea can all be caused or worsened by stress. Anxiety significantly reduces blood flow to the gastrointestinal tract, promoting irregularities in bowel movement; in severe cases, hypoxia can result in damage to the large intestine. Other digestive disorders such as irritable bowel syndrome (IBS), characterized by pain and bouts of constipation and diarrhea, are thought to be primarily fueled by stress.
- **Brain changes and depression** - Research utilizing imaging technology has shown that major stresses can reduce the quantity of tissue in regions of the brain that regulate emotions and self-control over time. Chronic stress is also directly associated with an increased risk for various types of depression and anxiety disorders such as post-traumatic stress disorder. The damage stress places on the brain may make dealing with future stresses progressively more difficult, but it can likely be reversed with effective stress-management techniques and behavior modification.
- **Insomnia** - Stress can cause a state of hyperarousal due to significant stimulation of the sympathetic nervous system, making it very difficult to fall asleep. While major stressful events can cause a short-term bout of insomnia that passes once the stress has subsided, long-term exposure to chronic stress can disrupt sleeping patterns and contribute to clinical sleep disorders.
- **Headaches and back pain** - Adrenal hormones and

cortisol can cause vascular changes that promote the development of a tension headache or migraine, either during the stress itself or for a period of time directly afterwards. Stress increases muscle tension, which can amplify the symptoms of a migraine. This concept is believed to also apply to an acute case of lower back pain, as well as chronic pain. One recent study in Europe found that people who are prone to anxiety and negative thinking are more likely to develop back pain, while another study implemented in the U.S. tied anger and mental distress to ongoing back pain.

- **Memory** - Excessive cortisol seems to interfere with the brain's ability to form new memories. Furthermore, during acute stress, cortisol obstructs neurotransmitter activity, making it harder to think straight or retrieve memories.
- **Hair and skin issues** - While research has provided mixed results, stress is thought to play a role in triggering hair loss in the autoimmune condition known as alopecia areata. Research also suggests that students with acne are more prone to outbreaks during exams compared to less stressful time periods. An increase in the male hormones, or androgens, could be a culprit, particularly in women. Stress can also trigger skin conditions such as psoriasis to appear for the first time, or make an existing case more severe. Many physicians are beginning to incorporate stress-management techniques, such as biofeedback and meditation, into treatment programs for the skin disease.
- **Reproductive issues** - One study found that women were less attracted to men with high levels of cortisol compared to men with lower levels. Researchers believe this may be because low levels of stress hormones suggest strength and health, which are desirable traits to be passed on to offspring. Investigations also suggest that individuals who are highly stressed experience a reduction in sex drive and have a higher risk for sexual dysfunction. This is believed to be promoted via numerous physiological mechanisms.
- **Premature aging** - Traumatic events as well as chronic stress can shorten telomeres, the protective caps on the ends of cell chromosomes, by promoting cell division and therefore expediting the aging process. Telomere erosion is directly associated with lifespan; genetically short telomeres are directly linked with premature aging disorders such as Werner syndrome.
- **Immune function** - High psychological stress and anxiety can influence hormonal dynamics that decrease one's resilience to cold viruses and bacteria. One of the most common forms of illness during periods of imbalanced stress and recovery are upper respiratory tract infections. This risk for illness is further increased when an individual on a low-carb diet experiences significant stress as many highly-metabolic immune cells use only glucose for fuel.
- **Job performance** - Studies of employees ranging from military personnel to bankers show that stress reduces productivity and job satisfaction. The Occupational Safety and Health Administration declared stress a workplace hazard, estimating that it costs the American industry more than \$300 billion annually.
- **Effects on performance**
- **Exercise adaptations** - The effects of exercise stresses (physiological and psychological) can provide positive or negative changes within the body depending on the

balance maintained with recovery measures. Proper balance of stress can result in improved neural efficiency, increased vascular compliance and oxygen extraction, and enhanced cardiac and musculoskeletal tissue integrity function. A lack of balance results in enhanced platelet adhesion and cortisol production, increased serum LDL cholesterol and triglycerides, low-grade inflammation, and loss of the protein-sparing mechanism.

- **Overreaching and overtraining** - Overreaching is an accumulation of training and other stresses resulting in a short-term decrement in performance that may take several days to several weeks to recover from. Overtraining is defined as an accumulation of training and other stresses resulting in a long-term decrement in performance that may take several weeks to several months to recover from. Overreaching and overtraining syndrome both occur when the total of all life stresses exceeds the ability of the body to cope with those stresses. Proper nutrition can reduce the symptoms of overreaching as well as reduce the risk of developing overtraining syndrome. Nutrition-related factors that increase the risk for overtraining include carbohydrate depletion, dehydration, and a negative energy balance. The negative, performance-depleting effects associated with overtraining are numerous and severe, including: extreme fatigue and lack of energy, leg discomfort, general aches and pains in muscles and joints, sleeping problems and insomnia, headaches, increased frequency of colds or infection, moodiness and irritability, loss of enthusiasm for a given activity or sport, decreased appetite and other eating problems, an increased incidence of injury, reduced maximal lactate and heart rate, elevated resting and sleeping heart rate, and no increase in cortisol in response to a stressful bout of exercise.
- **Weight management implications**
- **Cravings and emotional eating** - Studies have linked cortisol to increased cravings for sugar and fat. Many hormones have a part to play in appetite regulation as they influence the hypothalamus, which initiates the hunger mechanism. Neural-driven external factors that exert the strongest influence on the quantity of food intake throughout the day include stress, memory, social situations, time of day, and the taste or smell of food.
- **Visceral fat gain** - Research clearly links stress with visceral fat accumulation. Part of the reason is triglycerides liberated from subcutaneous stores in response to stress hormones end up being restored as visceral fat. Stress and fat gain are so strongly related that a recent investigation found that if one simply reduces their daily stress and gets better sleep, these measures alone can result in notable fat and weight loss. This new study published in the International Journal of Obesity, which included 472 obese adults participants, found that people who attained between six and eight hours of sleep and reported the lowest relative levels of stress had the greatest success in a weight loss program. The study demonstrated that people are more likely to maintain a healthy weight when not impeded by sleep deprivation, stress, or depression.

## Conclusion

Clearly the best way to deal with stress is to avoid it in the first place. Certainly it is impossible to avoid all stress, and

even if it was this would also be unhealthy. Exercise and physical activity provide positive outcomes when the training volume is appropriate. Negative stress (distress) is the type to avoid. Clinicians suggest one way to avoid significant distress is identify where it is coming from. Stress diaries are used to identify the people, locations, situations, and times that the stress occurs. In many cases, people do not realize the exact causes and frequency of stress in their lives. Oftentimes there are certain individuals and locations that create the worst stress responses. Once realized, one must cut the negatives; relationships and environments can be severed as easily as new ones can be made. Stress can also be neutralized; when stress accumulates, it should be removed in exchange for something that is considered pleasurable. This should not include alcohol-related situations as experts suggest this further fuels stress responses rather than diffusing them. Alcohol masks relaxation, so “drinking stress away” simply adds new stress of a physical nature. Activities research suggests may attenuate distress include yoga, tai chi, specific breathing methods, and progressive muscle relaxation. Likewise taking a nature walk, helping others, and playing games that induce laughter and group camaraderie all hold merit for reducing stress.

### References

1. National Scientific Council on the Developing Child. Cambridge: The Council: 2005 [cited 2007 April 9]. Excessive stress disrupts the architecture of the developing brain. Working Paper No. 3. Available from: [http://www.developingchild.net/pubs/wp/Stress\\_Disrupts\\_Architecture\\_Developing\\_Brain.pdf](http://www.developingchild.net/pubs/wp/Stress_Disrupts_Architecture_Developing_Brain.pdf).
2. Finkelhor D, Ormrod R, Turner H, Hamby S. The victimization of children and youth: a comprehensive, national survey. *Child Maltreatment*. 2005; 10(1):5-25.
3. Centers for Disease Control and Prevention. Atlanta: CDC; 2006 [cited 2007 April 9]. Adverse Childhood Experiences Study Available from: <http://www.cdc.gov/nccdphp/ace/index.htm>.
4. Dong M, Anda RF, Dube SR, Giles WH, Felitti VJ. The relationship of exposure to childhood sexual abuse to other forms of abuse, neglect and household dysfunction during childhood. *Child Abuse Negl*. 2003; 27(6):625-39.
5. Dube SR, Anda RF, Whitfield CL, Brown DW, Felitti VJ, Dong M, *et al*. Long-term consequences of childhood sexual abuse by gender of victim. *Am J Prev Med*. 2005; 27(5):430-8.
6. Anda RF, Felitti VJ, Chapman DP, Croft JB, Williamson DF, Santelli JS, *et al*. Abused boys, battered mothers, and male involvement in teen pregnancy. *Pediatrics*. 2001; 107(2):19.
7. Dietz PM, Spitz AM, Anda RF, Williamson DF, McMahon PM, Santelli JS, *et al*. Unintended pregnancy among adult women exposed to abuse or household dysfunction during their childhood. *JAMA*. 1999; 282(14):1359-64.
8. Dube SR, Anda RF, Felitti VJ, Edwards VJ, Williamson DF. Exposure to abuse, neglect and household dysfunction among adults who witnessed intimate partner violence as children: Implications for health and social services. *Violence Vict*. 2002; 17(1):3-17.
9. Whitfield CL, Anda RF, Dube SR, Felitti VJ. Violent childhood experiences and the risk of intimate partner violence in adults: assessment in a large health maintenance organization. *J Interpers Violence*. 2003; 18(2):166-85.
10. Dube SR, Anda RF, Felitti VJ, Chapman D, Williamson DF, Giles WH. Childhood abuse, household dysfunction and the risk of attempted suicide throughout the life span: findings from the Adverse Childhood Experiences Study. *JAMA*. 2001; 286(24):3089-96.
11. Anda RF, Whitfield CL, Felitti VJ, Chapman D, Edwards VJ, Dube SR, *et al*. Adverse childhood experiences, alcoholic parents, and later risk of alcoholism and depression. *Psychiatr Serv*. 2002; 53(8):1001-9.