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Review Article

## A REVIEW ON THE EFFECTIVENESS OF CURRENT APPROACHES TO STRESS MANAGEMENT

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### ABSTRACT

Stress is your body's way of responding to any kind of demand or threat. When you sense danger—whether it's real or imagined—the body's defenses kick into high gear in a rapid, automatic process known as the "fight-or-flight" reaction or the "stress response. The stress response is the body's way of protecting you. When working properly, it helps you stay focused, energetic and alert. In emergency situations, stress can save your life—giving you extra strength to defend yourself, for example, or spurring you to slam on the brakes to avoid an accident. Stress can also help you rise to meet challenges. It's what keeps you on your toes during a presentation at work, sharpens your concentration when you're attempting the game-winning free throw, or drives you to study for an exam when you'd rather be watching TV. But beyond a certain point, stress stops being helpful and starts causing major damage to your health, your mood, your productivity, your relationships, and your quality of life.

**Keywords-** Stress, psychology of stress, HPA axis, ACTH

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### INTRODUCTIONS

Stress and illness may have intersecting components. Several studies indicate such a link, while theories of the stress-illness link suggest that both acute and chronic stress can cause illness and lead to changes in behavior and in physiology. Behavioral changes can include smoking and changes in eating habits and physical activity. Physiological changes can include changes in sympathetic activation or HPA activity and immunological function.<sup>1</sup> However, there is much variability in the link between stress and illness<sup>2</sup> The HPA axis regulates many bodily functions, both behavioral and physiological, through the release of glucocorticoid hormones. The HPA axis activity varies according to the circadian rhythm, with a spike in the morning.

The axis involves the release of corticotrophin releasing hormone and vasopressin from the hypothalamus which stimulates the pituitary to secrete ACTH. ACTH may then stimulate the adrenal glands to secrete cortisol. The HPA axis is subject to negative feedback regulation as well.<sup>3</sup> The release of CRH and VP are regulated by descending glutaminergic and GABAergic pathways from the amygdala, as well as noradrenergic projections. Increased cortisol usually acts to increase blood glucose,

blood pressure, and surpasses lysosomal, and immunological activity. Under other circumstances the activity may differ. Increased cortisol also favors habit based learning, by favoring memory consolidation of emotional memories<sup>4</sup>

Selye demonstrated that stress decreases adaptability of an organism and proposed to describe the adaptability as a special resource, adaptation energy.<sup>5</sup> One study considered adaptation energy as an internal coordinate on the "dominant path" in the model of adaptation.<sup>6</sup> Stress can make the individual more susceptible to physical illnesses like the common cold. Stressful events, such as job changes, may result in insomnia, impaired sleeping, and physical and psychological health complaints.

Research indicates the type of stressor (whether it is acute or chronic) and individual characteristics such as age and physical well-being before the onset of the stressor can combine to determine the effect of stress on an individual.<sup>1</sup> An individual's personality characteristics (such as level of neuroticism),<sup>6</sup> genetics, and childhood experiences with major stressors and traumas may also dictate their response to stressors.<sup>7</sup>

Stress is your body's way of responding to any kind of demand. It can be caused by both good and bad experiences. When people feel stressed by something

going on around them, their bodies react by releasing chemicals into the blood. These chemicals give people more energy and strength, which can be a good thing if their stress is caused by physical danger. But this can also be a bad thing, if their stress is in response to something emotional and there is no outlet for this extra energy and strength. This class will discuss different causes of stress, how stress affects you, the difference between 'good' or 'positive' stress and 'bad' or 'negative' stress and some common facts about how stress affects people today.

Your nervous system isn't very good at distinguishing between emotional and physical threats. If you're super stressed over an argument with a friend, a work deadline, or a mountain of bills, your body can react just as strongly as if you're facing a true life-or-death situation. And the more your emergency stress system is activated, the easier it becomes to trigger and the harder it becomes to shut off.

If you tend to get stressed out frequently—as many of us do in today's demanding world—your body may be in a heightened state of stress most of the time. And that can lead to serious health problems. Chronic stress disrupts nearly every system in your body. It can suppress your immune system, upset your digestive and reproductive systems, increase the risk of heart attack and stroke, and speed up the aging process. It can even rewire the brain, leaving you more vulnerable to anxiety, depression, and other mental health problems.<sup>8</sup>

#### **Health problems caused or exacerbated by stress include:**

1. Depression and anxiety
2. Pain of any kind
3. Sleep problems
4. Autoimmune diseases
5. Digestive problems
6. Skin conditions, such as eczema
7. Heart disease
8. Weight problems
9. Reproductive issues
10. Thinking and memory problems

#### **Sign and symptoms**

The most dangerous thing about stress is how easily it can creep up on you. You get used to it. It starts to feel familiar even normal. You don't notice how much it's affecting you, even as it takes a heavy toll. That's why it's important to be aware of the common warning signs and symptoms of stress overload.<sup>8</sup>

#### **Cognitive Symptom**

- Memory problems
- Inability to concentrate
- Poor judgment
- Seeing only the negative
- Anxious or racing thoughts
- Constant worrying

#### **Emotional symptom**

- Depression or general unhappiness
- Anxiety and agitation
- Moodiness, irritability, or anger
- Feeling overwhelmed
- Loneliness and isolation
- Other mental or emotional health problems

#### **Physical symptom**

- Aches and pains
- Diarrhea or constipation
- Nausea, dizziness
- Chest pain, rapid heart rate
- Loss of sex drive
- Frequent colds or flu

#### **Behavioral symptom**

- Eating more or less
- Sleeping too much or too little
- Withdrawing from others
- Procrastinating or neglecting responsibilities
- Using alcohol, cigarettes, or drugs to relax
- Nervous habits (e.g. nail biting, pacing)

#### **General causes**

##### **Threat**

A perceived threat will lead a person to feel stressed. This can include physical threats, social threats, financial threat, and so on. In particular it will be worse when the person feels they have no response that can reduce the threat, as this affects the need for a sense of control.

Generally speaking, any threat to needs is likely to lead to stress being experienced.

##### **Fear**

Threat can lead to fear, which again leads to stress. Fear leads to imagined outcomes, which are the real source of stress.

##### **Uncertainty**

When we are not certain, we are unable to predict, and hence feel we are not in control, and hence may feel fear or feel threatened by that which is causing the uncertainty.

##### **Cognitive dissonance**

When there is a gap between what we do and what we think, then we experience cognitive dissonance, which is felt as stress. Thus, if I think I am a nice person then do something that hurts someone else, I will experience dissonance and stress. Dissonance also occurs when we cannot meet our commitments. We believe we are honest and committed, but when circumstances prevent us from meeting our promises we are faced with the possibility of being perceived as dishonest or incapable (i.e. a social threat).<sup>9</sup>



Figure 1- shown the different causes

### Life causes

There are many causes of stress in life including:

- Death: of spouse, family, friend
- Health: injury, illness, pregnancy
- Crime: Sexual molestation, mugging, burglary, pick-pocketed
- Self-abuse: drug abuse, alcoholism, self-harm
- Family change: separation, divorce, new baby, marriage
- Sexual problems: getting partner, with partner
- Argument: with spouse, family, friends, co-workers, boss
- Physical changes: lack of sleep, new work hours
- New location: vacation, moving house
- Money: lack of it, owing it, investing it
- Environment change: in school, job, house, town, jail
- Responsibility increase: new dependent, new job<sup>4</sup>

### Effects of Stress on Your Health

When you are in a stressful situation, your body launches a physical response. Your nervous system springs into action, releasing hormones that prepare you to either fight or take off. It's called the "fight or flight" response, and it's why, when you're in a stressful situation, you may notice that your heartbeat speeds up, your breathing gets faster, your muscles tense, and you start to sweat. This kind of stress is short-term and temporary (acute stress), and your body usually recovers quickly from it.

But if your stress system stays activated over a long period of time (chronic stress), it can lead to or aggravate more serious health problems. The constant rush of stress hormones can put a lot of wear and tear on your body, causing it to age more quickly and making it more prone to illness<sup>10</sup>

If you've been stressed out for a short period of time, you may start to notice some of these physical signs:

- Headache

- Fatigue
- Difficulty sleeping
- Difficulty concentrating
- Upset stomach
- Irritability

When stress becomes long-term and is not properly addressed, it can lead to a number of more serious health conditions, including:

- Depression
- High blood pressure
- Abnormal heartbeat (arrhythmia)
- Hardening of the arteries (atherosclerosis)
- Heart disease
- Heart attack
- Heartburn, ulcers, irritable bowel syndrome
- Upset stomach - cramps, constipation, and diarrhea
- Weight gain or loss
- Changes in sex drive
- Fertility problems
- Flare-ups of asthma or arthritis
- Skin problems such as acne, eczema, and psoriasis<sup>3</sup>

Physiologists define stress as how the body reacts to a stressor, real or imagined, a stimulus that causes stress. Acute stressors affect an organism in the short term; chronic stressors over the longer term. The general adaptation syndrome (GAS), developed by Hans Selye, is a profile of how organisms respond to stress; GAS is characterized by three phases: a nonspecific mobilization phase, which promotes sympathetic nervous system activity; a resistance phase, during which the organism makes efforts to cope with the threat; and an exhaustion phase, which occurs if the organism fails to overcome the threat and depletes its physiological resources.<sup>11</sup>

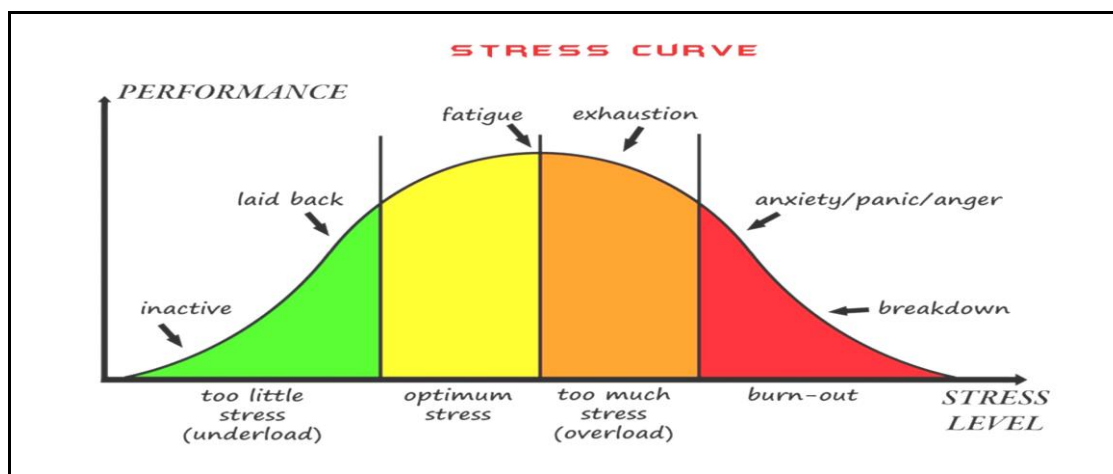


Figure 2- Shown the Relation between Body Performance & Stress Level

### Biology of Stress

The brain endocrine interactions are relevant in the translation of stress into physiological and psychological changes. The autonomic nervous system (ANS), as mentioned above, plays an important role in translating stress into a response. The ANS responds reflexively to both physical stressors (for example bar reception) and to higher level inputs from the brain.<sup>12</sup>

The ANS is composed of the parasympathetic nervous system and sympathetic nervous system, two branches that are both topically active with opposing activities. The ANS directly innervates tissue through the postganglionic nerves, which is controlled by preganglionic neurons originating in the inter mediolateral cell column. The ANS receives inputs from the medulla, hypothalamus, limbic system, prefrontal cortex, midbrain and monoamine nuclei.<sup>13</sup>

The activity of the sympathetic nervous system drives what is called the "fight or flight" response.

The fight or flight response to emergency or stress involves mydriasis, increased heart contraction, vasoconstriction, bronchodilation, glycogenolysis, gluconeogenesis, lipolysis, sweating, decreased motility of the digestive system, secretion of the epinephrine and cortisol from the adrenal medulla and relaxation of the bladder wall.

The parasympathetic nervous response, "rest and digest" involve return to maintaining homeostasis and involves miosis, bronchoconstriction, increased activity of the digestive system and contraction of the bladder walls. Complex relationships between protective and vulnerability factors on the effect of childhood home stress on psychological illness, cardiovascular illness and adaption have been observed. ANS related mechanisms are thought to contribute to increased risk of cardiovascular disease after major stressful events.<sup>14</sup>

The HPA axis is a neuroendocrine system that mediates a stress response. Neurons in the hypothalamus, particularly the paraventricular nucleus, release vasopressin and corticotrophin, which travel through the hypophyseal portal vessel where they travel to and bind to the corticotropin-releasing hormone receptor on the anterior pituitary gland. Multiple CRH peptides have been identified, and receptors have been identified on multiple areas of the brain, including the amygdale. CRH is the main regulatory molecule of the release of ACTH.

The secretion of ACTH into systemic circulation allows it to bind to and activate Melanocortin receptor, where it stimulates the release of steroid hormones. Steroid hormones bind to glucocorticoid receptors in the brain, providing negative feedback by reducing ACTH release. Some evidence supports a second long term feedback that is non-sensitive to corticosterone secretion. The PVN of the hypothalamus receives inputs from the nucleus of the solitary tract, and lamina terminalis. Through these inputs, it receives and can respond to changes in blood.

The PVN innervation from the brain stem nuclei, particularly the noradrenergic nuclei stimulate CRH release. Other regions of the hypothalamus both directly and indirectly inhibit HPA axis activity. Hypothalamic neurons involved in regulating energy balance also influence HPA axis activity through the release of neurotransmitters such as neuropeptide Y, which stimulates HPA axis activity. Generally, the amygdale stimulates, and the prefrontal cortex and hippocampus attenuate, HPA axis activity; however, complex relationships do exist between the regions.<sup>15</sup>

The immune system may be heavily influenced by stress. The sympathetic nervous system innervates various immunological structures, such as bone marrow and the spleen, allowing for it to regulate immune function. The adrenergic substances released by the sympathetic nervous system can also bind to and influence various immunological cells, further providing a connection between the systems. The HPA axis ultimately results in the release of cortisol, which generally has immunosuppressive effects. However, the effect of stress on the immune system is disputed, and various models have been proposed in an attempt to account for both the supposedly "immunodeficiency" linked diseases and diseases involving hyper activation of the immune system. One model proposed to account for this suggests a push towards an imbalance of cellular immunity (Th1) and humoral immunity (Th2). The proposed imbalance involved hyperactivity of the Th2 system leading to some forms of immune hypersensitivity, while also increasing risk of some illnesses associated with decreased immune system function, such as infection and cancer.<sup>16</sup>

### Psychology of Stress

Chronic stress and a lack of coping resources available or used by an individual can often lead to the development



of psychological issues such as delusions,<sup>17</sup> depression and anxiety (see below for further information).<sup>18</sup> This is particularly true regarding chronic stressors. These are stressors that may not be as intense as an acute stressor like a natural disaster or a major accident, but they persist over longer periods of time. These types of stressors tend to have a more negative effect on health because they are sustained and thus require the body's physiological response to occur daily.<sup>19</sup>

This depletes the body's energy more quickly and usually occurs over long periods of time, especially when these microstressors cannot be avoided (i.e. stress of living in a dangerous neighborhood). See allostatic load for further discussion of the biological process by which chronic stress may affect the body. For example, studies have found that caregivers, particularly those of dementia patients, have higher levels of depression and slightly worse physical health than non-caregivers.<sup>7</sup>

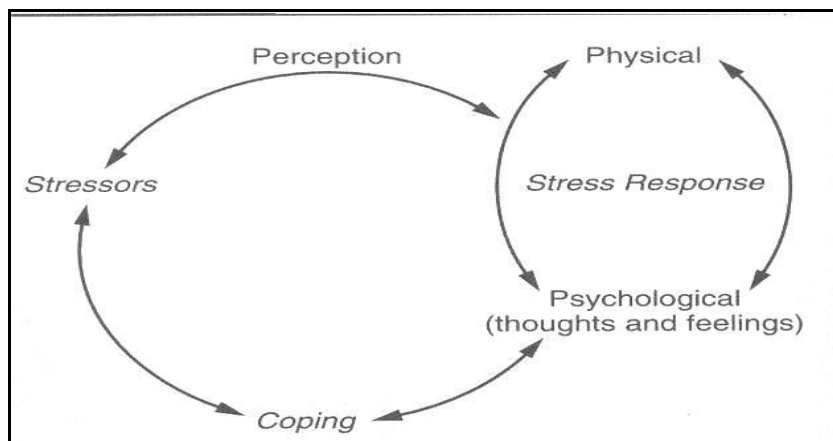


Figure 3- Psychological stress

When humans are under chronic stress, permanent changes in their physiological, emotional, and behavioral responses may occur.<sup>20</sup> Chronic stress can include events such as caring for a spouse with dementia, or may result from brief focal events that have long term effects, such as experiencing a sexual assault. Studies have also shown that psychological stress may directly contribute to the disproportionately high rate of coronary heart disease contribute morbidity and mortality and its etiologic risk factors. Specifically, acute and chronic stress have been shown to raise serum lipids and are associated with clinical coronary events.<sup>21</sup>

However, it is possible for individuals to exhibit hardiness—a term referring to the ability to be both chronically stressed and healthy.<sup>22</sup> Even though psychological stress is often connected with illness or disease, most healthy individuals can still remain disease-free after being confronted with chronic stressful events. This suggests that there are individual differences in vulnerability to the potential pathogenic effects of stress; individual differences in vulnerability arise due to both genetic and psychological factors. In addition, the age at which the stress is experienced can dictate its effect on health. Research suggests chronic stress at a young age can have lifelong effects on the biological, psychological, and behavioral responses to stress later in life.<sup>23</sup>

### Treatment of stress

The first step in treating stress is to prevent it. Prevention methods also often are used as a part of a multifaceted treatment program. There are many ways to reduce stress and minimize the long-term complications of chronic stress, such as heart disease, depression, anxiety, and type 2 diabetes. The most effective strategy is to prevent and address stress in a variety of ways beginning with taking

inventory of stressors and developing strategies to eliminate or reduce them. Exercise is a well accepted way to reduce stress. Exercise may allow the muscles to use and "work off" the body's build up of stress-induced epinephrine and other hormones so that excessive amounts do not accumulate and cause ongoing high blood sugar levels and damage to arteries. Deep breathing exercises and such disciplines as yoga and tai chi help to induce a calm state, and clear the mind of stressful thoughts. For some people an hour of carefree window shopping, a spa treatment, or watching the game with buddies, are great ways to relax and reduce stress.

Other preventive and treatment methods include getting a good night's sleep, eating a well-balanced heart-healthy diet that is low in saturated fat, sugar and processed carbohydrates. A heart-healthy diet is also high in fiber, whole grains, low-fat proteins and dairy products and fruits and vegetables. Drinking alcohol and using caffeine in moderation are also important. It is also recommended that people who smoke quit.

For people in whom stress has lead to depression, insomnia, anxiety, or other psychological problems, psychotherapy and possibly medication may be needed.

Alternative treatments or home remedies that have been listed as possibly helpful for Stress may include:

- Ashwaghandha (Indian ginseng)
- Elemi oil
- Frankincense oil

### Medication treatment-

There is currently no such thing as a stress medication, but generally doctors will prescribe anxiety medications instead. Technically stress and anxiety are different, but

they share enough similarities that the effects are considered the same.

If you are simply under a great deal of stress but your actual anxiety symptoms are not that strong, your doctor will likely prescribe you a very mild anxiolytic (anti-anxiety drug). Buspirone (Buspar) is a popular one, as it is considered one of the weakest on the market but also

has the fewest side effects. Buspar is one of the few that is only an anxiolytic as well, so it's unlikely to cause fatigue, personality changes, etc. All it does is reduce anxiety<sup>24</sup>. The following list of drugs are used in stress are as follow- Prozac, Sertraline, citalopram, fluoxetine, amitriptyline, venlafaxine, celexa, paroxetine, luvox, prazosin, fluvoxamine<sup>7</sup>.

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