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Stress and their effect on health

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Abstract
Stress is an important concept in health psychology and behavioral medicine, but it proves somewhat difficult to define. So, stress can be defined as a complex transaction between a particular individual and a particular environment that takes place when the person is threatened or challenged. These demands can be experienced as positive, as when someone poses to us a challenge that we enjoy meeting: "Would you like to go out with me?" Positive stress also called Eustress- gives us the opportunity to satisfy our need for mastery as well as many other motives. Demand can also be experienced as negative. Negative stress- that is, distress- disrupts our life, leading to anxiety and depression, poor health, and even death.

Keywords: Stress, disease, health

Introduction
Stress is the general term describing the psychological and physical response to a stimulus that alters the body's equilibrium (Lazarus & Folkman 1984) [3]. The stimulus that throws the body's equilibrium out of balance is called a stressor, for instance, stepping on a piece of glass while walking barefoot and getting a puncture wound is a stressor. The body's response to a stressor is the stress response, also called the fight-or-flight response; this response consists of the bodily changes that occur to help you cope with the stressor. If you get a puncture wound, your body may produce chemical called endorphins and enkephalins, its own versions of painkillers and cause white blood cells to congregate at the site of injury to fight off any infectious agents. These responses work to bring the body back to normal, to restore homeostasis.

The long list of potential stressors is categorized according to a number of criteria. Stresssors can be short-term (acute stressor) or long- term (chronic stressor); they can be physical psychological (which affect events at the level of the person), or social (of course, some combination). Physical stressors, such as not eating for 2 days, generally apply to most people; psychological and social stressors, on the other hand, can be much more subjective. Going to a dance club for hours can be a party animal's idea of a great time or a shy person's nightmare. In general, it is our perception of a stimulus that determines whether it will elicit the stress response, not necessarily the objective nature of the stimulus itself. Stress is not always a negative process, however. Stress, or more accurately, stressors can lead to positive change and growth (Linley & Joseph, 2004) [4]. Consider that college students reported that their most stressful experience during the previous 6 months had led to personal growth (Park & Fenster, 2004) [5]. The term stress has been used in different ways by different theorists. "Stress as any circumstances that threaten or are perceived to threaten one's well- being and that thereby tax one's coping abilities."

Stress is a slippery concept. People sometimes use the word stress to describe threats or challenges, other times to describe our responses. Most psychologists would define Karen's missed train as a "stressor," Karl's physical and emotional responses as a "stress reaction," and the process by which Karen and Karl related to their environments as stress. Thus, stress is not just a stimulus or a response. It is the process by which we appraise and cope with environmental threats and challenges. When perceived as challenges, stressors can have positive effects by arousing and motivating us to conquer problems. Championship athletes, successful entertainers, and great teachers and leaders all thrive and excel when aroused by a challenge. But more often stressors threaten our resources- our status and security on the job, our loved ones' health or well-being, our deeply held beliefs, our self-image (Hobfoll 1989) [5].

And when such stress is severe or prolonged, it may also harm.

The Resistance Phase

Once the body is primed to fight or flee, enter the resistance phase (also known as the adaptation phase), in which the body mobilizes its resources to achieve equilibrium despite the continued presence of the stressor. In other words, it adapts to the stressor.

Both the initial stress response and the resistance phase require energy, which comes from fat cells, muscles, and the liver. The increased blood flow helps deliver the energy quickly and efficiently to the parts of the body that need it most. Digestion, growth, sex drive, and reproductive processes are slowed during times of stress. In women, menstruation may stop or may occur irregularly in response to chronic stress; in men, sperm and testosterone levels may decrease. In addition to these changes, no new energy is stored during stress; this means that chronic stress leads to a lack of any reserve of energy to repair bodily damage, producing a sense of fatigue.

During the resistance phase, cortisol helps the body return to a more normal state in the presence of a continued stressor. Cortisol levels reach their peak within 20-40 minutes after the onset of the acute stressor, and they return to baseline, on set of the acute stressor, and they return to baseline, on average, up to 1 hour after the acute stressor has been eliminated; however, with continued stress, cortisol levels may not return to baseline. The more extreme the stressor, the more glucocorticoids are produced in an attempt to restore equilibrium, and this process decreases the functioning of the immune system with extreme stressor the release of cortisol also occurs with the release of neuropeptide-Y; a neuropeptide is a type of protein that can act as a neurotransmitter or a hormone. Neuropeptide-Y can function as a neurotransmitter that decreases the activity of the HPA axis, thereby dampening down anxiety or fear.

The Exhaustion Phase

If the stressor continues, the exhaustion phase sets in. Sely proposed that, with a continued stressor, the body becomes exhausted because its limited resources for dealing with stress are depleted. More recent research has found that rather than producing "exhaustion," the continued stress response begins to damage the body, leading to an increased risk of stress-related diseases. In addition, cortisol can damage hippocampal cells decreasing the number of these cells as well as the amount of branching of some of their dendrites such changes adversely affect learning and memory.

Stress and Their Effect on Health

Stress can affect the immune system, which functions to defend the body against infection. Critical to the immune system are two classes of white blood cells: B Cells, which mature in the bone marrow, and T Cells, which mature in the thymus, an organ located in the chest. One type of T Cell is the natural killer (NK) cell, which detects and destroys damaged or altered cells, such as precancerous cells before they become tumors. Glucocorticoids, which are released when the stress response is triggered, hinder the formation of some white blood cells (including NK Cells) or kill other white blood cells making the body more vulnerable to infection and tumor growth. For this reason, many studies investigating the relationship between stress and immune system measure the number of circulating white blood cells, such as NK cells. People who exhibit greater sympathetic nervous system responses to stress also show the most changes in immune system functioning, indicating that changes in the immune system are moderated by changes in the sympathetic nervous system. Exposure to some chronic psychological stressor can increase inflammation and the risk for auto immune disorders.

A Field called psychoneuroimmunology focuses on the ways in which mental and emotional states affect the immune system.

Stress can harm the immune system. Because stress can impair the functioning of the white blood cells, it can play a role in the length of time it takes a wound to heal.

Cancer

Stress can't cause cancer, there is evidence that it can affect the growth of some cancerous tumors.

- If the immune system is suppressed, NK cells do not work as well to prevent the spread of tumor cells. Levy and her colleagues 1988 found a relationship among the perception of inadequate social support, feeling of distress and fatigue with little joy, and lower levels of NK cell activity. Such negative psychological experiences, by weakening the immune system, left people more vulnerable to the growth of cancerous tumors.
- Stress can facilitate the growth of capillaries feeding into the tumor. When stress has a distinct physical cause, our bodies produce more capillaries to supply blood to that area. If the stressor is an injury or infection such as would be capillary growth is beneficial because the vessels carry more white blood cells to the part of the body that needs them. However, if a tumor is already present in the body, the stress response will cause more blood to be supplied to the tumor, literally feeding to and supporting its growth. Stress does not appear to cause a tumor to develop, only to assist in its growth.
- The perception of control can also play a role in the progression of some types of cancer. Among cancer patients, those who did not perceive much control and felt helpless about their cancer were likely to have a recurrence sooner and to die earlier from the cancer.

Although psychological factors can affect the immune system, these findings should be interpreted with caution. The type of cancer, and biological factors related to the progression of the disease, can outweigh psychological factors in tumor growth, especially in the final stages of the disease. Moreover, some people may be genetically endowed with an immune system that is more effective at warding off illness.

Heart Disease

The increased blood pressure created by chronic stress, in combination with hormonally induced narrowing of the arteries, promotes atherosclerosis, or the buildup of plaque (fatty deposits) on the inside walls of the arteries. As plaque accumulates, the arteries narrow- which makes the heart work even harder to meet the body's need for nutrients and oxygen. Working harder means pumping the blood with more power, creating more damage to the arteries, and a vicious cycle is created. This chronic wear and tear on the cardiovascular system can lead to heart damage, which can lead to sudden death from inadequate blood supply to the heart muscle or from irregular electrical firing of the muscle, preventing coordinated heartbeats.

When a person experiences a strong stressor, his or her body's

response may cause a piece of plaque to break off. (Strike *et al*. 2004) [7].

The loosened plaque may then block an artery going to the heart, preventing or limiting blood flow to that organ, leading to a heart attack. For someone who already has heart disease, even extremely positive states of stress, such as joy can precipitate this event and cause sudden death.

Some people, perhaps because of a history of heart disease or an overly responsive HPA axis, are more vulnerable to calamitous aftereffects of stress. For these people, work stress can increase the risk of a heart attack; for example, if such a person is working under a tight deadline, this can increase the risk of heart attack soon after the deadline, as can being stuck in traffic. Such stress- related heart attacks need to be distinguished from the recently identified and potentially fatal "broken heart syndrome" which has caused people to die after becoming extremely upset this syndromes occurs when a person has a massive amount of adrenaline in response to an acute emotional stressor along with a temporary weakening of the heart so that it cannot pump effectively.

Stress, Emotions and Heart Disease

Stressor often elicit negative emotions such as fear, anger, sadness, and helplessness. Such emotions can produce a rise in heart rate that lasts longer than does the rise following positive emotions (Brosschot & Thayer 2003) [8]. When the stressors are chronic, they can lead to helplessness, depression, and despair. Depression in particular appears to be associated with a greater likelihood of heart disease- (Barth *et al*. 2004 Rosengren *et al*. 2004) [9, 10]. Consider these findings:

- Depressed people have a faster heartbeat even when at rest and they tend to have high blood pressure.
- People who are more likely to experience negative emotions have an increased risk of heart disease and heart attacks, perhaps from a biological hyper reactivity to stress (Habra *et al*. 2003) [11].

When the depression is treated, however, these stress- related responses subside, and heart rate and blood pressure decrease. Anxiety is also associated with heart disease, possibly because it can lead to high blood pressure and changes in cardiac functioning- and also because people may attempt to cope with it by engaging in unhealthy behaviours, such as smoking or drinking.

Lifestyle can make a Difference

The course of heart disease can be affected by a change in lifestyle. A study of people with severe heart disease found that intensive changes in diet, exercise, stress management (such as meditation), and social support could help to halt the narrowing of the arteries, and could even reverse the atherosclerosis and minimize further damage to the heart. Other studies confirm the positive effects of such intensive lifestyle changes (Lisspers et at. 2005) [12].

Health- Impairing Behaviours

In general, stress can also have a less direct, though no less serious, effect on health: In attempting to cope with stressor people may engage in self-destructive behaviours such as overeating, smoking, or having one drink too many. The term health- impairing behaviours generally refers to any actions that have the potential to damage health. These behaviours include smoking, substance abuse, poor nutrition, lack of exercise and risky behaviours such as unsafe sex or unprotected sustaining.

Changing Health- Impairing Behaviours/Remedy of stress

Changing a problematic behaviour pattern can be difficult, as most smokers have learned when they try to quit and have to make several attempts before they are successful.

Stages of changes: Five steps towards change. Some programs that promote changing unhealthy behaviours such as smoking drinking, and overeating look at progress as either or; Participants either change their behaviour or they continue it; they either quit or they don't quit. Based on extensive research, Prochaska and his colleagues (Prochaska Norcross, et at., 1994) [13] have developed a different conception of change, with five stages:

- **Precontemplation:** The person has no intention of changing the problematic behaviour and will often deny that there is a problem. He or she may change temporarily if a lot of pressure is applied by others but will relapse once that pressure is removed.
- **Contemplation:** The person acknowledges that there is a problem and may even begin to think about doing something about it. Real action, though, is seen as far in the future, not in the present. It is easy for people to get stuck in this phase.
- **Preparation:** The person has a plan of action to change, makes adjustments to the plan, and intends to begin changing within a month, making a specific commitment to change. However, some people in this stage still have mixed feelings about change and may not begin to change when they intended, leading to a relapse to an earlier stage. People in this stage are very aware of the problem, it causes, and possible solutions.
- **Action:** This is the stage most obvious to others because people in this stage change their behaviours and their environments. People in this stage also receive the most support.
- **Maintenance:** The person in this stage is consolidating the gains he or she has made and has an eye on relapse prevention. Without a strong commitment to maintenance, relapse to the first or second stage is likely. Friends and family may be less supportive because action has already been taken; however, because people in this stage are still vulnerable to relapse, support remains important.

This conception is based on the observation that, in reality, most people go through stages of change, each stage having its own tasks that must be completed in order to progress to the next stage. Moreover, progress is not necessarily constant, and people may relapse to an earlier stage before resuming forward movement. This model of change has been applied to a variety of behaviours: helping people to stop smoking, drinking, drug use, or overeating and to start using condoms, using sunscreen, exercising, or getting mammograms.

Processes That Encourage change

A number of different processes, or interventions, may help people move from one stage of change to another. An intervention, as the term is used by psychotherapists, is a specific technique or treatment for reducing health impairing behaviours.

For those in the earliest stage of change there are two helpful process:

- **Consciousness raising:** Consciousness raising involves becoming aware of both the problem and the way the person avoids addressing it. AL's view of his smoking and drinking was that they would take care of themselves

when his work problems were resolved, so he didn't feel that he had to do anything about them.

- **Social liberation:** Social liberation occurs when external forces help create more alternatives to the behaviour and provide both information about the problematic behaviour and support. This process occurs at the level of the group. Social liberation is imposed on Al at work, where he can't smoke because the office is smoke-free. The hours he can smoke each day are limited because he has to leave the building to have a cigarette. This also makes the act of smoking less convenient, less comfortable, and less pleasurable.

In the move from contemplation through preparation and toward action, two other processes are helpful.

- **Emotional arousal:** Emotional arousal consists of focused awareness and feelings directed toward change. Al experienced emotional arousal when he realized that his body was weak and he couldn't go on this way.
- **Self-re-evaluation**: Self re-evaluation involves taking stock, both emotionally and intellectually, and addressing the question of whether engaging in the problematic behaviour is what the person really wants to be doing-whether it reflects the person he or she wants to be. Often, part of this re-evaluation is weighing the pros and cons of changing or maintaining the behaviour.

Conclusion

Stress is a fact of life. Stressors are all around us: at work, in our environment, and in our personal lives. Because stress arises from so many different factors and conditions, it's probably impossible to eliminate it completely. But we can apply techniques to lessen its potentially harmful effects.

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