
Research Paper**Impact of Stress on Humans and Its Detection Using Artificial Intelligence****Hrithick Paul¹**, **Nirbhay Mishra²**, **Sayani Ghatak³**, **Dharampal Singh⁴**, **Debmitra Ghosh⁵**, **Sahil Das⁶**, **Pratyush Singha⁷**^{1,2,3,4,5,6,7}CSE, JIS University, Kolkata, India*Corresponding Author: nirbhay.mishra@jisuniversity.ac.in

Abstract: Stress is our body's emotional and physical reaction to a circumstance or event that we perceive as risky or difficult. Different levels of stress are experienced by people on a regular basis, which causes serious problems. Three main types of stress are acute stress, episodic stress, and chronic stress. A new or challenging situation generates acute stress in your body. It's the emotion people experience as a deadline approaches or when they just miss getting hit by a car. We might even come across it as a result of a fun pastime. Like an exciting ride on a roller coaster or a stunning feat of personal achievement. Acute stress is a category for short-term stress. After a little period of time, the body and emotions usually return to normal. Then comes Continual acute pressures are referred to as episodic acute stresses. The cause of this can be persistently tight job deadlines. It might also be due to the frequent high-stress situations that some professions face. Long-lasting demands are ultimately what lead to chronic stress. One example is living in a high-crime area or constantly fighting with your significant other. These health issues have all been related to the onset of stress, dilated pupils, increased heart rate, anxiety, mood swings, lack of sleep, weight gain, insomnia, panic attacks, persistent headaches, and other variables. So, the stress management system will offer a technique of management from which we can identify the level of stress or kinds of stress and offer solutions for how we can lower the tension and release people from this type of stress.

Keywords: stress, disease, man, woman, acute, chronic etc.

1. Introduction

Introduction Our daily lives are plagued by stress, which has been linked to a variety of problems. It is the body's psychological reaction to a circumstance or event that we regard as risky or difficult. Those who are stressed out have trouble concentrating and lose their motivation to work. Acute stress, episodic stress, and chronic stress are some of the numerous types of stress. Stress of this nature causes physical and psychological problems. Individuals lose focus and sink into mental health issues. Acute stress leads to short-term stress, which can be brought on by people experiencing weak mental sensations as a deadline approaches or when they just barely avoid being hit by a car. Because the emotions and body often return to normal after a certain short amount of time, it is known as short-term stress. People's hearts beat faster as a result of severe stress, which leaves them feeling tired for a while. Perspiration: When we are under stress, our body temperature increases, causing us to perspire more; anxiety: When people are exposed to a stressor, they experience anxiety and terror. When acute stresses recur regularly, the other type of stress, episodic acute stress, might occur. Regular high-stress as a result. A person may feel as though they are constantly under pressure or that things are going wrong as a result of episodic acute stress. This can be mentally and physically draining. Acute episodic stress creates muscle tension, which is our body's

defence mechanism against pain and harm. Our muscles are unable to relax when we are subjected to episodic acute stresses. Muscle tension is frequently a contributing factor to migraines, which are also brought on by episodic acute stressors. Under episodic acute stress, migraine frequency and severity are likely to rise. Last time, chronic stress was caused by stresses that persisted over a protracted period of time. Examples include residing in a neighbourhood with a high crime rate or frequently quarrelling with your life partner. Stress like this seems to never stop. We frequently struggle to see any way to alter or better the circumstance that is the root of our on-going stress. Those with chronic stress have to deal with a wide range of problems. The most typical problem that anyone has ever encountered is weight gain. It frequently happens as a result of "stress eating," but it can also be caused by chronic hormonal imbalances caused by on-going stress. Many people also struggle with insomnia, which makes it difficult for them to fall and stay asleep with any sleep they did manage to get; this typically leaves them feeling foggy. No matter what kind of rest or sleep you get, emotional fatigue is another problem that manifests as feeling exhausted most of the time. Chronic headaches, also referred to as tension headaches, are the fourth group that occur frequently and more than 15 days a month. The stress management system will now determine the type or degree of stress based on the fundamental characteristics. The parameters will assist the system in performing the analysis and prediction work

from which the type of stress will be found, and based on the forecast, the system will provide safety measures and suggestions for how to reduce a certain stressor. The management system controls the many types of stresses and provides the anticipated stress type as well as suggestions for how people might find relief. It not only provides many methods for improving attention or relieving stress, but also throws light on prospective fixes and a study of how many people are affected by stress. Modern medical research holds that stress is the underlying factor in all diseases. When we are stressed, certain substances (hormones) in our body are released. Your body changes in a variety of ways as a result of these hormones. For instance, your

- i. Blood pressure might get up.
- ii. The heart might pound.
- iii. Muscles might contract.
- iv. stomach could become rigid
- v. Attention spans might degrade
- vi. Memory loss could deteriorate.

So, the aforementioned is the main impact of stress, which will encourage various illnesses in humans. The crux of the situation is that we must implement an approach that will entirely or partially eliminate tension.

the results and it is concluded by explaining how the present study will benefit the community [2].

2. Related Work

Occupational stress is a major problem for individuals and organizations. Stress can cause burnout, ill-health, high workforce turnover, absenteeism, lowered morale and reduced efficiency and performance [1]. Stress coping methods are the physiological, cognitive, behavioural and psychological methods to deal with stress. [2]. adolescence is a dangerous period of time where young people experience self-organization and role confusion. For them, stress mainly comes from academic tests, interpersonal relations, relationship problems, financial, and career exploration. Such stress may usually cause psychological, physical, and behavioural problems. [4] People with ASD face problems with effective stress management due to their high self-perceived levels of stress, poor ability to cope with it, and difficulties with the accurate detection of the source of stress. Consistently, being able to measure stress appears to be highly vital for this specific group.[5] A relationship was found between perceived stress and perfectionism such that respondents with higher levels of perceived stress tended to be classified as maladaptive perfectionists and those with lower levels of perceived stress tended to be classified as adaptive perfectionists.[6] The components of critical incident stress management include preincident education/mental preparedness training, individual crisis intervention, support/on-scene support, demobilization after disaster or large-scale events, defusing, critical incident stress debriefing, significant other support services for families and children, and follow-up services and professional referrals as necessary.[7]Stress Management Training programs are increasingly being adopted in the military field for resilience empowerment and primary stress prevention. In the last several years, advanced technologies (virtual reality in

particular) have been integrated in order to develop more innovative and effective stress training programs for military personnel, including soldiers, pilots, and other aircrew professionals. This systematic review describes experimental studies that have been conducted in recent years to test the effectiveness of virtual reality-based Stress Management Training programs developed for military personnel[8].The stress management group included sessions on progressive relaxation, deep muscle relaxation autogenic training, visual imagery and modified systematic desensitization[9].This randomized controlled trial was designed to determine whether practising stress management techniques would decrease disease activity and promote psychosocial functioning in inflammatory bowel disease patients[10].Crisis intervention has emerged over the last 50 years as a proven method for the provision of urgent psychological support in the wake of a critical incident or traumatic event.[11].In order to test intervention effectiveness, such methods examine the outcomes of between-group differences in intervention exposure: participants are rarely asked about their experiences of the intervention[12]. Stress is a global public health problem with several negative health consequences, including anxiety, depression, cardiovascular disease, and suicide [13]. The Brief Stress and Coping Inventory (BSCI) was designed to gather stress and coping information from an individual in 15 minutes, compared to a nearly 1-hour completion time required for the parent instrument. All BSCI scales are described; along with our scoring methodology [14].Stress is an inevitable and necessary component of life--to a degree. Excessive stress can become a disease promoting agent and constitutes a major health concern today. [15]. As stress is increasingly recognized as a factor in overseas effectiveness, strategies to successfully control or manage stress need to be introduced into the training for living and working in different cultures[16].Work stress contributes significantly to corporate health costs. Numerous corporations have implemented worksite stress-management interventions to mitigate the financial and personal impact of stress on their employees [17].The question of teacher motivation is of paramount concern for educational leaders and managers. Both the commonly observed deficiency in teacher motivation and the abundance of teacher stress are serious problems that can be mitigated through teacher education [18]. This study identifies the Stressors and coping strategies of nursing staff (students, trained staff and those who had left the profession before qualification) in a variety of ward specialisms [19].Research into stress among psychiatrists has attempted to identify stressors, which can lead to physical illness and psychological distress.[20]. This study investigated the effects of an internet-based self-help stress management program with a randomized controlled design. Of 85 participants, 26% dropped out, leaving a final sample of 63 participants with 23 in the treatment group and 40 in the waiting list control group. [21]. Many college students exhibit unhealthy eating behaviours, consuming large quantities of high-fat foods and few fruits and vegetables. Perceived stress has been linked to daily dietary choices among college students; however, this work has been conducted among predominantly white, female populations. [22]. I argue that stress management and coping studies in the

health care setting have not been sufficiently theoretically grounded.[23]. Employee health and wellness are important for employees, their families, and their organizations. [24]. There are many occupational stress management programmes available which are designed to prevent and cure the negative aspects of job-stress [25]. Stress in the workplace is now widely recognized as a major problem facing American industry. A growing number of companies are offering some form of stress management intervention. [26]. According to the World Health Organization, stress is a significant problem of our times and affects both physical as well as the mental health of people. [27]. Exercise can be an effective component of a stress management program, and all types of exercise can be beneficial for stress management. [28]. in the research described in the chapter we examine the hypothesis that adaptations associated with lactation might facilitate stress management in recently parturient women. [29]. A meta-analysis was conducted to determine the effectiveness of stress management interventions in occupational settings. [30].

3. Theory/Calculation

Mental illness can be caused by stress. In addition to the mind and brain, it affects the body. Because the body and mind are intertwined, any disease or stress that the mind experiences will manifest in the other areas of the body. Acute stress, episodic acute stress, and chronic stress are only a few of the several types of stress. Many types of stress and its effects are discussed in the initial sections as well. Each of these affects the mentality while also making people weaker. Also, it lowers their morale. People can experience physical problems as well. Thus, stress management programmes offer some tried-and-true techniques. We might develop solutions to stress with the use of these techniques.

Stress management technique:

As we've seen, there are several types of tensions, and as a result, people have to cope with a wide range of problems. As a result, there are particular stress management approaches. Another one of them is used for long-term treatment, while others are intended for quick or temporary relief. Quick or temporary relief only offers solace for a short while. On the other hand, long-term relief eases a person's tension for a very long time and takes time to show but lasts for a very long time.

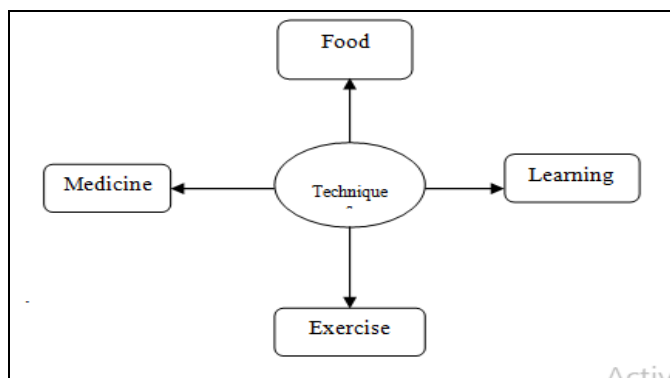


Fig1: short time techniques

The solutions listed in the accompanying chart provide improved stress alleviation for individuals who are experiencing it. The techniques are organized into the following sections:

Food: The first component is the eating segment, which helps people build both physical stamina and power and a sense of fulfillment in their minds. Even drinking water slightly eases anxiety.

Learning: Reading fantastic books also helps to reduce mental tension. Doing almost any sort of art can help you relax. Depending on your level of talent, personal tastes, and the resources available, you might sing a song on a musical instrument, construct a clay sculpture, or just sketch on a sticky note.

Meditation: Starting a meditation practice is easy and has many wonderful benefits. While there are many various styles of meditation, mindfulness meditation can be one of the best beginner methods for stress reduction. You might also be instructed to focus your attention on a steady object, such as the sound of your own deep breathing, in order to unwind. To watch and let go of your own opinions is the goal. In any case, regular meditation practice can assist you in de-cluttering your mind and reducing your stress-related subjective feelings.

Exercise: Incorporate physical activity in your everyday routine because it may in some way assist you in reducing stress. Pick an exercise you genuinely enjoy, whether it's weightlifting, boxing, swimming, cycling, or taking a leisurely stroll around the block. If you're feeling stressed out throughout the workday, take a break and go for a walk, or go to the gym or break room and do some push-ups. Exercise releases endorphins, which make you feel better physically and mentally.

These examples provide temporary or fast relief. While it lasts for a long time, the long-term alleviation is more beneficial and good.

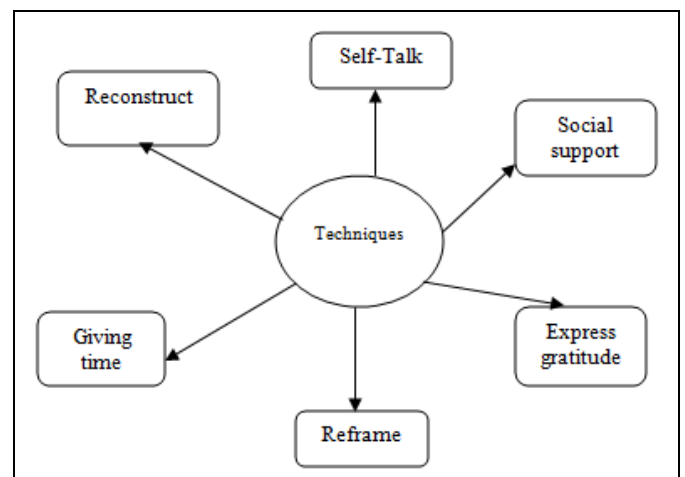


Fig: 2

From the above image we get the techniques for long-term relief:

Self-talk:

Self-talk greatly affects how we feel. If you are always having negative thoughts, you'll feel more anxious and dissatisfied. Unfortunately, changing your self-talk patterns is

difficult; it takes a high level of self-awareness to recognise when you are using self-talk, discipline to change your thinking, and time and patience to make sure the new habits stick. Even so, if you make a conscious effort to make your inner dialogue happier and more optimistic, you'll feel less anxious in almost any situation.

Reconstruct:

Knowing what makes you anxious the most will help you restructure your life to reduce or eliminate those worries. For instance, if a certain customer is the main source of your stress, it might be time to consider firing them. If you're feeling stressed out because you have too much to do, you can decide to delegate part of it or ask your team for more help.

Social Support:

One of the best things you can do when dealing with either short-term or long-term stress is to seek out social support. Share your stress issues with the people in your life, including your co-workers, bosses, friends, and family, and ask them if there is anything they can do to help. If issues persist despite making helpful adjustments, consider speaking with your health care physician or a licensed therapist.

Giving time:

Any long-term health management approach must include leisure time. You'll need to take breaks from your job throughout the day and frequent career vacations. It is detrimental for far too many individuals to combat stress by immersing themselves in more work.

Reframe:

Studies suggest that stress perception may affect health outcomes more than actual physical stress. Instead of seeing stress as this horrible emotion that must be avoided at all costs, learn to accept it as a normal aspect of life with benefits and drawbacks and to keep in mind that it can be actively handled and managed.

Express gratitude:

Several studies have shown that expressing gratitude, whether verbally, in writing, or even just to oneself, has a significant impact on mood and stress reduction. Make it a habit to consider or express your thankfulness for all the wonderful, both personally and professionally, in your life.

4. Result and discussion

Beginning with an improvement in attention, a drop in anxiety, and a decrease in pain, controlling and lowering stress has several advantages. Better health results from stress management strategies often. Drugs are not used in stress management programmes. The issue of stress affects both individuals and organisations greatly. Excessive stress leads to exhaustion. There are several actions that people and organisations may take to decrease the detrimental effects of being overstressed on their health and productivity.

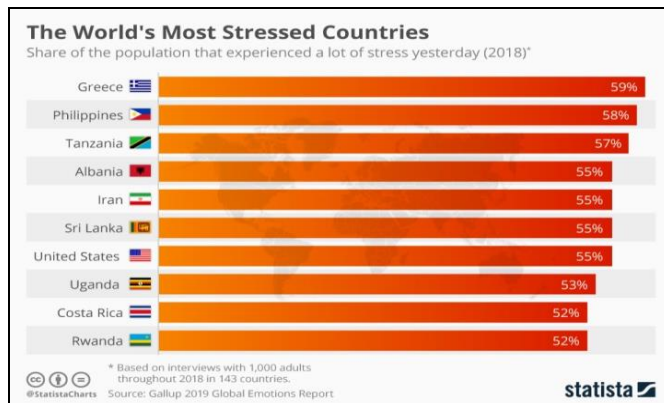


Fig: 3 World most stressed countries

Sources: <https://cdn.statcdn.com/Infographic/images/normal/17822.jpg>



Fig: 4 causes of stress

Source: <https://home.hello-driven.com/wp-content/uploads/2020/06/causes-of-stress.jpg>

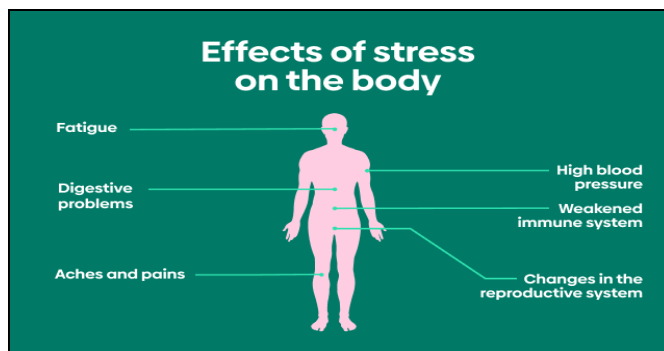


Fig: 5 Effect of stress on body

Sources: <https://mantraprograms.s3.amazonaws.com/wp-content/uploads/2022/07/01032446/Physical-Effects-of-Stress-Managing-Physical-Effects-of-Stress.png>

We learned from fig. [3] That, in compared to other nations, Greece is the world's most stressed country given the aforementioned information and conclusions. Tanzania is now in third place, followed by the Philippines. Figure [4] illustrates the various causes of stress, which include the following: working too hard, experiencing financial issues, having conflicts with friends, ending a relationship, and losing a job.

5. Future scope & conclusion

The other sections of this paper have discussed the approaches that people might use to their advantage and discover a solution to their stress-related problems. Due to the fact that there are several forms of stress, such as acute stress, episodic acute stressors, and chronic stress. Other types of

stress can also cause people to have issues with their physical and mental health. As a result, we will employ the Machine learning and artificial intelligence concept for the envisioned future application, from which users will be provided with predictions regarding the type of stress they are currently experiencing. The "mantra," which not only calms the mind but also makes the inner body calm and collected, will be discussed or started after the ML prediction. "Mantra" serves as a physical and mental conduit. It encourages peace and mental calm. Also aids in calming and centering the body. There will be some circumstances before the prediction occurs, and individuals will respond in accordance with those norms. Then depending on the responses that form features-task, the AI model will foresee and carry out the same task as has been specified. The criteria will be distributed to college or university students as part of a survey that will help us understand more about their mental health. We'll find just how much stress a student goes through, because a student's life is a very important and crucial life. Also, particularly in college, students face a range of problems in their life. So, there is a considerable chance that students would feel stress, which will affect their campus life. That further deteriorates their mental health.

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