Examination of the Physical and Mental Effects of Stress

The Texas Legislature House Bill 18 (2019) emphasized the importance of educating our students regarding mental health. Educators who are aware of the physical and mental effects of stress can make a difference in the lives of their students through early identification of symptoms; and, intervention to promote mental wellness before the situation worsens. Knowing the physical and mental effects of stress is especially important and timely due to the increase in COVID-19-related mental health issues. The CDC reported in August 2020 that over 40% of U.S. adults surveyed in late June 2020 reported at least one adverse mental or behavioral health problem related to the pandemic. Our students are a population at increased risk for psychological distress and unhealthy coping due to the challenges associated with the pandemic added to the routine pressures of completing their educational goals. This article provides Educators with the knowledge to identify the physical display and the mental effects of stress in order to refer students to appropriate mental health services. This article contains relevant information and future implications post-pandemic for educators. The information is presented by a nationally board-certified psychiatric mental health nurse practitioner and a nationally board-certified family nurse practitioner who are educators themselves.

Keywords: *mental health, stress, university, educators*

Life stress is strongly associated with poor mental and physical health (Cohen, S., Janicki-Deverts D., & Miller G, 2007; Slavich, et al., 2010). Educators who are aware of the physical and mental effects of stress can make a difference in their students' lives through early identification of symptoms. Most behavioral health issues, including substance abuse, are very manageable if diagnosed early.

Educators routinely face numerous challenges such as integrating important new content in an already full curriculum and the evolving expectations of students, parents, and college administrators among a myriad of other daily tasks and trials. As if these challenges were not enough, now educators must cope with an international pandemic that has huge implications both personally and professionally. Knowing the physical and mental effects of stress is especially important and timely due to increased COVID-19-related mental health issues. The Center for Disease Control (CDC) reported in August 2020 that over 40% of U.S. adults surveyed in late June 2020 reported at least one adverse mental or behavioral health problem related to the pandemic (Czeisler, M., Lane, R., Petrosky, E., et al., 2020). The typical college demographic reported having experienced disproportionately worse mental health outcomes, increased substance use, and elevated suicidal ideation due to the pandemic (Young, 2020).

College students are a population at increased risk for psychological distress and unhealthy coping due to the pandemic's challenges added to the usual pressures of completing their educational goals. The authors, who both teach graduate-level nursing students at a public university in Texas are a nationally Board-Certified Psychiatric Mental Health Nurse Practitioner

and a nationally Board-Certified Family Nurse Practitioner. This article seeks to share relevant information for current and post-pandemic educators. This article provides educators with the knowledge to identify the physical manifestations and the mental effects of stress so they can refer students to appropriate mental health services.

Physical Effects of Stress

Stress is the body's reaction to situations that it perceives as harmful. When a person feels threatened, a chemical reaction occurs in the body that allows one to act to prevent injury. This reaction is known as the "fight-or-flight," or the stress response. During a stress response, the heart rate increases, breathing quickens, muscles tighten, and blood pressure becomes elevated (APA, 2018). The body's normal physiologic response to acute stress is noted in Table 1.

Respiratory system	Airway between the nose and the lungs constricts
Cardiovascular system	Heart rate increases and the heart muscle has stronger contractions. Blood vessels dilate, elevating blood pressure
Endocrine/Hormonal system	Cortisol ("stress hormone"), adrenaline, and Noradrenaline increase to provide more energy
Gastrointestinal system	Nerve cells are activated and Gut bacteria changes, influencing brain and mood
Male reproductive system	Testosterone is produced and the sympathetic nervous system is activated which creates arousal
Female reproductive system	Hormonal changes may affect menstruation, sexual desire, fertility, mood, menopause
Musculoskeletal system	Muscles tense up

Table 1. Normal Physiological Reaction to Stress (APA, 2018)

The body's stress-response system to acute stress is designed to be short-term and self-limiting. Once the threat is removed, hormone levels return to normal, the heart rate and blood pressure return to baseline, and other systems resume their regular activities. The human body is not designed to handle long-term chronic stress without negative consequences. Understanding how stress impacts health is critically important. The negative health effects resulting from stress exceed those of other well-known risk factors, such as tobacco use, excessive alcohol consumption, and physical inactivity (Holt-Lunstad, J., Smith T., & Layton J., 2010). Chronic stress causes the "fight or flight" reaction to stay "turned on." The long-term activation of the stress-response system and the overexposure to cortisol, adrenaline, and other stress hormones can interrupt almost all body system processes leading to chronic disease states (Klein, 2013). Adverse effects from stress account for substantial morbidity and mortality (Pedersen, A., Bovbjerg D., and Zachariae, R, 2011).

Chronic stress causes the muscles in the body to be in a more or less constant state of guardedness. This state can lead to tension headaches or back pain. Chronic stress also contributes to long-term problems for the heart and blood vessels. Risk of developing hypertension, heart attack, or stroke are increased by the consistent and ongoing increase in heart rate, and the elevated levels of stress hormones and of blood pressure. Continual ongoing stress may cause inflammation in the circulatory system, particularly in the coronary arteries, leading

to a heart attack. Chronic stress can negatively impact and weaken the immune system. Chronic or ongoing stress may cause nausea, trouble swallowing, heartburn, pain, bloating, diarrhea, constipation, abdominal cramping, increase or decrease in appetite, and other intestinal discomforts.

Stress and strong emotions can affect the respiratory resulting in shortness of breath and rapid breathing. These conditions may worsen breathing problems for people with pre-existing respiratory diseases such as asthma and chronic obstructive pulmonary disease.

Interruption or impairment of the endocrine (hormonal) system from chronic stress may lead to the development of conditions including chronic fatigue, metabolic disorders such as diabetes and obesity.

Stress is associated with changes in intestinal bacteria, which may then influence mood. Stress does not cause stomach ulcers. Bacterial infections are the cause of ulcers. However, with ongoing stress, an ulcer may become more troublesome. Stress affects digestion and which nutrients that the intestines absorb. Chronic disease states like Inflammatory Bowel Disease or Irritable Bowel Syndrome are often worsened by stress.

Excess amounts of the "stress hormone," cortisol affects the normal functioning of the male and female reproductive systems. A decline in a male's sex drive, erectile dysfunction, impotence, and impaired sperm production may occur due to ongoing stress. High levels of ongoing stress may be associated with absent or irregular menstrual cycles, more painful periods, changes in the length of cycles, impaired sexual desire, infertility, and worsening of menopausal symptoms.

Numerous other body systems are impacted by stress (Yaribeygi, H., Panahi, Y., Sahraei, H., et al, 2017). Skin disorders related to or worsened by chronic stress include acne, psoriasis, eczema, and hair loss. Stress affects the immune system increasing risk and vulnerability to infections. Insomnia, memory and concentration impairment, low energy, and weight gain may be attributable to ongoing high levels of stress.

Behavioral and Mental Effects of Stress

Critical health-related behaviors develop during adolescence and early adulthood. The degree of stress on the individual during this time plays a key factor in the decision-making process, as decisions are made that may impact one's health for a lifetime. For example, choices to smoke tobacco or use other substances occur throughout this time frame (Dalton & Hammen, 2018). The effect of stress on the student does not occur in isolation. College students experience stress from the transition to a new campus, a new semester, or new methods of learning whether attending online or an in-person classroom. Dvořáková, Greenberg, and Roeser (2019) suggest that students bring their lived experiences, personalities, socioemotional and demographics status, cognitive, attentional, and mental health issues with them to the university setting. These factors interact with their social support system and the campus environment. Pre-existing mental/behavioral health issues may be heightened or worsened during this initial period of acclimation to the college setting.

Implications

Stress can be either a positive or negative force. The positive results of stress are demonstrated by a student who implements a strategy to correct a social issue by becoming a catalyst for

change such as utilization of a day planner to keep due dates in order thereby decreasing anxiety for the student. In contrast, negative stress can cause one to make poor choices. Common behavioral/mental issues observed in young adulthood are primarily related to the degree of negative stress that one perceives or believes that they experience on a *daily* basis (Adams, Meyers, & Beidas, 2016). Life-research has demonstrated that the more intense the stress, the greater likelihood that the young adult will choose unhealthy coping skills. The following signs/symptoms should help alert educators that the student is not coping well: onset of or increased anxiety, depression, sleeplessness, lack of motivation, overeating, substance use/abuse, or changes in behavior patterns (Dalton & Hammen, 2018; Toussaint, Shields, Dorn & Slavich, 2016).

Dalton and Hammen (2018), evaluated the effects of depressive symptoms and stress on college students' health behaviors. They reviewed the daily diaries of 127 students and found that chronic and daily stress, as well as depressive symptoms, contributed to unhealthy lifestyle choices. Interestingly enough, acute stress did not seem to impact negative health choices. Chronic *daily* stress seemed to be the primary cause of poor health-related choices.

Strategies

Recognizing, preventing, and mitigating stress are vital considerations for college students' well-being. Prevention strategies are the most effective approach for avoiding unhealthy behaviors. Various strategies exist to assist young adults in developing positive coping skills. Stress reduction can take many forms, including eating a nutritious diet and regular exercise. Other methods include meditation, mindfulness, nature walks, visualization, self-compassion, the use of forgiveness, counseling, and taking self-improvement classes, to name a few (Fong & Loi, 2016; Payne, Loi, & Thorsteinsson). A wide assortment of technology and applications are useful for assisting with stress and anxiety, such as Happify, Calm, and Breathe2Relax. Even with the many mental health-focused apps available today, seeking appropriate support and therapy from appropriate mental health professionals is vital.

Good nutrition is an important stress management tool. Helpful strategies include campus campaigns that encourage students to eat regularly, limit caffeine, include fruits and vegetables in their diets, and incorporate healthy snacks like nuts, yogurt, and foods high in fiber. Educators and others involved in monitoring students are in a unique position to detect and intervene in unhealthy behaviors and coping skills. Identification and early intervention are essential to improve student outcomes (Dalton & Hammen, 2018; Toussaint, L., Shields, G. S., Dorn, G., & Slavich, G. M., 2016). College faculty and others who work directly with students should know how to recognize the presence of poor or unhealthy coping behaviors and intervene accordingly.

Recommendations/Summary

The increase in-adverse mental conditions leading to physical symptoms associated with the COVID-19 pandemic highlight the broad impact of the pandemic affecting our students; and the need for educators to identify students at risk for psychological distress and unhealthy coping, to refer for treatment of these conditions. The Texas Legislature House Bill 18 (2019) promotes training and education on the signs of mental health conditions; and emphasizes the importance

of educating our students regarding mental health. With proper training, educators can promote mental wellness, prevent mental health problems, and intervene before issues can occur. Educators must work with university officials to increase access to intervention and prevention resources, clinical diagnoses, and treatment options. Educators need to advocate for community-level efforts that prioritize the mental health of college students, racial and ethnic minorities, and essential workers such as educators themselves.

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