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A systematic – Review of academic stress intended to improve the educational journey of learners

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ABSTRACT

As learners progress through their educational path, they experience various hassles and transitions, certainly encountering stress along the way. This can be due to the academic burdens placed on them, the personal growth they endure, and the adjustments required in new settings, all fundamental to their educational experiences. Preeminent academic stress is a concerning problem worldwide, affecting every facet of students' lives. Hence, it is crucial to have a full understanding of academic stress, including its sources, symptoms, and ramifications, in order to recommend appropriate intervention strategies. Previously, many review articles have been published covering various aspects of academic stress, but this review aims to serve as an umbrella term for academic stress, enclosing every aspect under its thorough coverage. Data is collected from various journals using different virtual databases, primarily Google Scholar. The search was done using keywords relevant to every phase of academic stress such as academic stress, causes of stress among students, impacts of stress, symptoms of stress, management techniques, etc. The review comprehensively explores stress at academic levels, covering causes, symptoms, detection tools, and impacts, and proposing effective coping tactics beneficial for students to cope with stress.

1. Introduction

Stress has been studied by researchers since the mid-20th century, and it remains a topic of interest across various facets of social, biological, physiological, and environmental sciences. These continued concerns illustrate the depth at which stress impacts different phases of health, behavior, and life, which has led to an interdisciplinary focus on how we can better understand and reduce stress in today's world. Stress is a routine part of human life and every human being experiences mild levels of stress or anxiety arising from daily hassles and major life events. As defined by the American Psychological Association, stress involves changes affecting every system of the body, influencing how people behave and feel. It is a normal reaction to everyday demanding situations but can become unhealthy when upsets daily life functioning.

Every student faces numerous challenges at multiple points during their academic journey and everybody perceives and deals with stress differently. Academic stress is an adaptive psychological systematic process that occurs in learning environments when students face challenges and perceive them as stressful (Toribio and Franco, 2016). It is a detrimental concern across various regions. It is represented by the physical and mental response to academic stressors beyond the person's capacity to deal with them. This includes feelings of pressure, anxiety, and tension linked to academic responsibilities like exams, coursework, and overall workload (Pascoe et al., 2020). Students undergo various transitions throughout their academic journey such as promoting to new classes, leaving home, and meeting people from diverse backgrounds, etc, some students take these transitions positively and enjoy them but some students become disturbed because of these alterations. It is worth noting that there is an alarming increase in the prevalence of academic stress, with a substantial proportion of high school and college students reporting significant stress related to academic pressures (American College Health Association, 2021). When stress hits severe levels, it influences students' mental health which may lead to various psychological disorders like Depression (Schimelpfening, 2020). Students are the cornerstone of the future, and essential for building an educated society. Academic accomplishment is a significant life goal for them and can be severely impacted if students succumb to depression (Abbas et al., 2024; Akinola et al., 2019). Stress and anxiety are the emotional conditions that are considered basic components of every individual's life and students cannot escape from experiencing these states (Jiménez-Mijangos et al., 2023a). In the course of their educational journey, they go through several academic tasks that can be a source of stress during their learning process (Jiménez-Mijangos et al., 2023a).

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1.1. Sources of academic stress

Numerous diverse and complex origins of academic stress among students are highlighted by researchers and are known as stressors. The most important daily hitches of a student's life that contribute to stress are academic-related strains such as enduring education, exam and test preparation, paper writing, grade-level competition, boring mentors, and efforts to attain all the knowledge quickly (Yang et al., 2021). Every student experiences stress in their own way regardless of age, gender, educational background, and grade level. Some students with poor time management skills may find it challenging to submit their assignments and meet deadlines whilst for others it can be stressful to leave their comfort zone and travel to attend classes. Fig. 1 illustrates the most common academic stressors that impact students' physical, mental, and emotional well-being.

The lack of self-confidence in students can lead to doubting their capabilities and excessive worry about failing exams, causing anxiety and stress. In today's highly competitive educational environment, several factors including but not limited to social media, family bonding, social relationships, etc mainly influence students' performance (Likisia, 2018). A recent study found that the primary origin of stress for students stems from subject content. 27% of students frequently reported having trouble understanding the material. The second reason, cited by 18% of students, is the perceived excessive load of assignments. About 17% of students considered challenging items of tests and their interaction with boring, impatient, and angry professors as stress-inducing. Homework as a fourth common source of stress was cited by 15% of students (Fathiyah, 2022).

1.2. Types of stress

Every student has a unique way and ability to respond to challenging situations, if they take academic hurdles as opportunities and make efforts to overcome them, stress may positively impact them (Sang et al., 2018), or else, it is the most prevailing stress factor that can affect the psychological well-being of students (Barbayannis et al., 2022). The American Psychological Association identifies three main types of stress, which are illustrated in Fig. 2.

1.3. Acute stress

Acute stress is a short-term and the most common type of stress, typically caused by sudden pressures or thinking about recent or upcoming events. For instance, a student might feel stressed when preparing for or taking exams, etc.

1.4. Episodic acute stress

Students who repeatedly face stressful situations may experience episodic acute stress. For instance, a student striving for perfection in every task may feel stressed when encountering minor setbacks or challenges.

1.5. Chronic stress

Long-term and ongoing stress, known as chronic stress, is activated by constant and inescapable pressure and can lead to severe health

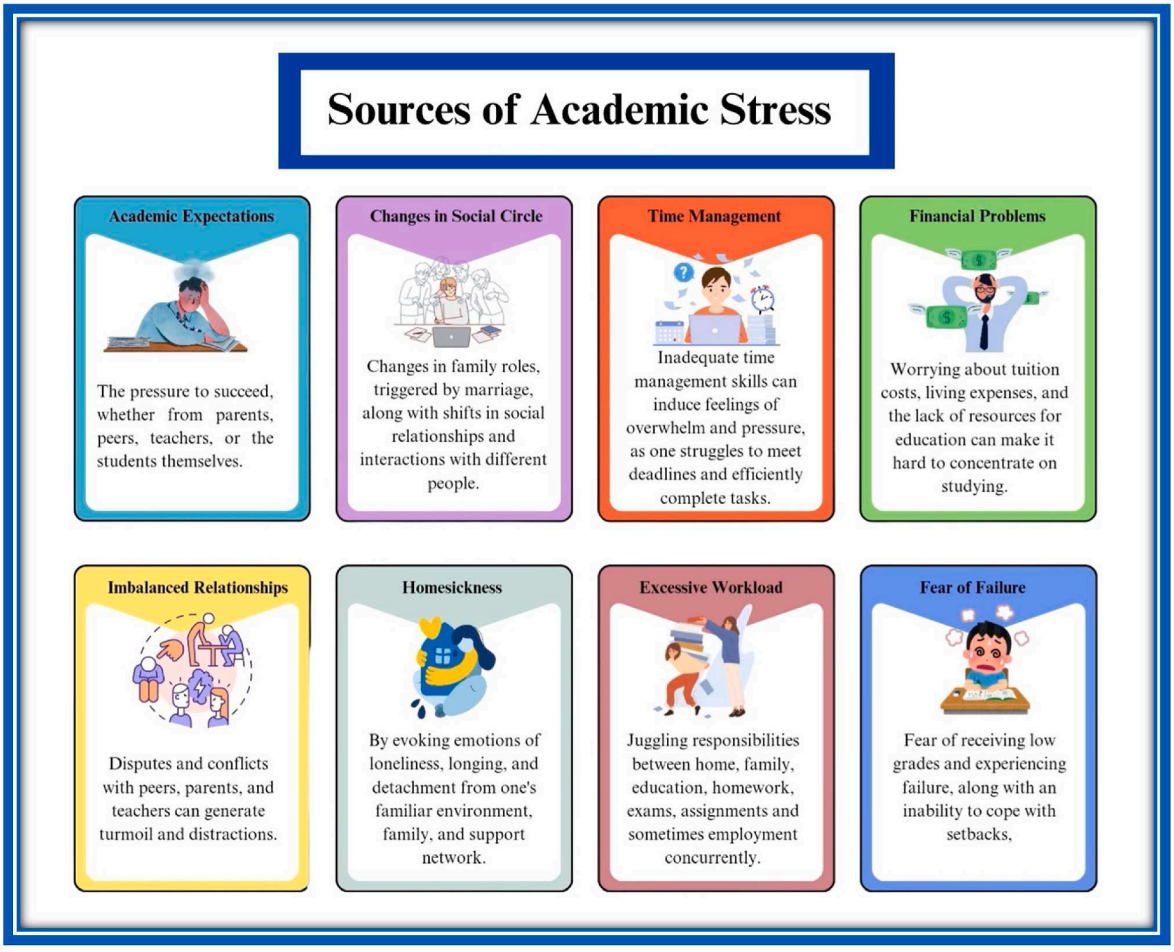

Fig. 1. Sources of stress.

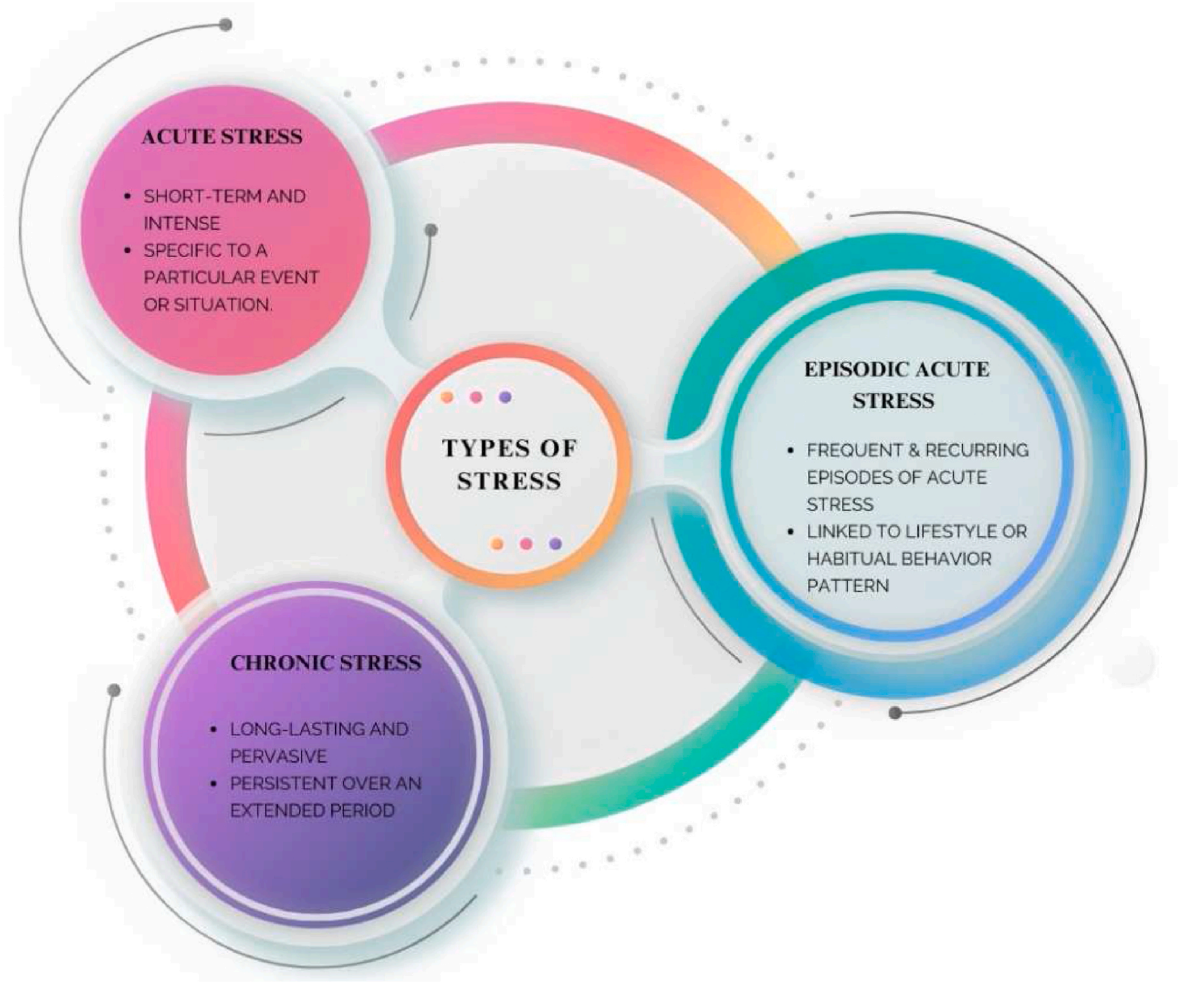

Fig. 2. Types of stress experienced by students during their academic tenure.

issues if not managed properly. For example, a student facing continuous pressure to excel academically and afford tuition, books, and other expenses may experience enduring stress.

1.6. Signs of stress in students

Students and academics should be mindful of the common indicators of stress. Mainly stressed students experience lethargy, raised blood pressure, depression, amplified cravings, anxiety, restlessness, distractibility, and tension (Chua et al., 2018). Academic stress is exhibited through a wide range of bodily signs including heightened cardiac activity, hypertension, accelerated breathing, adrenal hormone levels, migraines, excessive sweating, involuntary shaking, physical aches, weight fluctuations, and sleep patterns (de la Fuente et al., 2020). It also influences cognitive functions such as destructive thoughts, perceived tension, feelings of hopelessness, frustration, nervousness, guilt, and restlessness leading to behaviors like unnecessary crying, self-harm, substance abuse, and aggression (Garett et al., 2017a).

1.7. Detection of stress

Various methods are utilized by clinicians and professionals to identify and measure the level of stress among students. Some traditional methods based on psychometric survey applications are widely used for determining stress and anxiety (Dumitrescu et al., 2014). The psychometric surveys examine psychological and societal aspects of personality (Durán Acevedo et al., 2021). Stress can also be measured when the human body starts behavioral and bodily reactions to stressful events such as fear, happiness, nervousness, irritation, repulsion, etc (Burghardt, 2019). Nowadays there are an increasing number of electronic devices for the detection related to stress in educational settings. These methods include but are not limited to Perceived Stress Scale (PSS), Electromyogram (EMG), Electroencephalogram (EEG), Electrocardiogram (ECG), and physiological signs such as sweat, salivary cortisol, high blood pressure, breathing, and heartbeat variability etc (Rajendran et al., 2021).

1.8. Impacts of stress

The objective of the formal education system is to make students physically, mentally, and professionally ready to handle life's hurdles. However, during this process, a significant burden is placed on their mental and physical health. The substantial impact of academic stress can lead to various positive or negative outcomes.

Positive stress, or what psychologists call "eustress," is a type of stress students feel when they are excited and keeps them motivated to achieve academically. This type of stress aids students in scoring good grades. Stress can enhance performance up to a certain level, but once individuals exceed it, it can negatively impact their ability to perform well (Rowland and van Lankveld, 2019). Short-term stress can be useful for students especially when taking an exam, as it positively impacts memory (Yaribeygi et al., 2017). Mild stress can also improve the immune system and sharpen the body's ability to deal with injuries and illnesses such as infection and wounds etc (Dhabhar, 2018). Eustress is a

motivator that enables students to take action and is crucial for satisfaction (Kenwright, 2018). However, when stress levels go up from mild, it takes a turn towards concern. It happens when academic demands increase and students lack the abilities and resources to handle it. Severe academic stress is linked to poor mental health, regardless of factors such as gender, role, race, or academic grade (Barbayannis et al., 2022). Academic stress worsens the symptoms of depression and anxiety, dropping academic performance. Depressive symptoms arising from academic and home stress significantly impact students' academic achievements and overall quality of life (Deng et al., 2022). The stress experienced by students also significantly influences their physical health, mainly leading to fatigue and weakness (Musabiq et al., 2020). Stressed students tended to eat more unhealthy foods such as ready-made meals and fast foods etc (Choi, 2020). Excessive academic stress not only affects mental health, causing anxiety, depression, and poor academic performance, but also has a significant impact on physical health, leading to issues such as headaches, stomachaches, loss of appetite, and tiredness (Deng et al., 2022). Moreover, academic stress negatively impacts academic achievements and self-confidence and leads to college dropout rates and declines in graduation rates, resulting in increased alcohol consumption, absenteeism, delays in meeting deadlines, and weakened academic motivation (Gobena, 2024). The extreme links are reported between academic stress and mental & physical health (Travis et al., 2020).

1.9. Techniques to mitigate academic stress

Academic stress is not something that cannot be managed or coped. Every student develops their unique coping mechanisms to overcome the stress. Some students dedicate all their time and energy to finding solutions, while others prefer to avoid problems by running away (Kenwright, 2018). Physiological, behavioral, psychological, and cognitive methods to manage stress are known as stress-coping methods (Kassymova et al., 2018a). The professionals have introduced several methods to manage stress. One of the key methods to tackle stress is to pinpoint the stressors (Deng et al., 2022). The techniques shown in Fig. 3 are beneficial for students to manage their educational stress effectively.

1.9.1. Time management

Managing time appropriately is a major concern for students and can cause anxiety and fear (Yanik et al., 2016). It is quite challenging for students to catch a balance between their academic and personal routines, however, better academic performance and lower anxiety levels are highly associated with effective time management (Adams and Blair, 2019). Time perspective (TP), an automatic personal behavior is an effective analyst of academic outcomes as it assists students in categorizing their tasks into different periods, ensuring reliability over time and helping them organize and schedule their responsibilities (Scherer et al., 2017). Efficient time management skills enable students to use their time wisely, getting more in less duration. The following guidelines can help students to handle their time more effectively.

1.9.1.1. Prioritizing. Prioritization is the ability of students to tackle the most important activities first. Students can organize their academic tasks based on the academic priority matrix– what is urgent or non-urgent and what is important or non-important (Efron, 2023).

1.9.1.2. Setting deadlines. Students should always set deadlines especially when they are working in a group, as not doing so can cause delays or sometimes halt abruptly. Setting deadlines not only aids in making the process smooth but also guarantees that progress is maintained

Fig. 3. Techniques to manage stress in academia.

(Efron, 2023).

1.9.1.3. Avoiding procrastination. Students should spot time traps such as taking long breaks, using social media over a long period, copying tasks among team members, etc (Offiah and Doherty, 2018). Postponing the errands that need to be done can greatly harm academic success.

1.9.1.4. Setting boundaries. Students should learn to avoid commitments and say no when necessary. When students take on too much, they can become overloaded. It's important not to always say no, but rather to focus on what can be done without feeling stressed. It is okay to say yes to those things, but it's also important to avoid making promises that can't be kept (Kiefer, 2011). This helps them prioritize academic tasks over unnecessary accountabilities.

1.9.1.5. Task-directed. Multi-tasking can be beneficial, but focusing on one task at a time is more effective. This approach can help students efficiently complete difficult tasks by maintaining an organized flow of responsibilities (Efron, 2023).

1.9.2. Social support

This form of support comes from a network of individuals including family, friends, and community (Awang et al., 2014). The scarcity of social support is considered a well-known factor in mental health problems. Support from family, friends, and loved ones is essential for better psychological well-being and helps reduce depressive symptoms among stressed students (Alsubaie et al., 2019). It is found that students with low social support are negatively linked to mental health symptoms, including stress, anxiety, and depression (Guo et al., 2021). Study tenure is the developmental stage of students during which their focus shifts from parents to peers, and friends become an increasingly more important source of social support compared to family. Social support has a strong negative correlation with the stress levels experienced by students in academia (Kugbey, 2015). The feeling of being supported is crucial in helping students manage their stress levels and shield them from various psychological issues (Camara et al., 2014). Social support not only alleviates students' mental fatigue but also enhances academic achievements by increasing their self-esteem (Li et al., 2018). Perceived friend support and perceived social support from someone special also reduce the likelihood of academic failure, decreasing the dropout rate among students (Tinajero et al., 2020). Support from interpersonal relationships serves as a protective barrier against academic stress by fostering a sense of belonging, security, and thereby improving students' ability to manage stressors.

1.9.3. Healthy lifestyle

A healthy lifestyle includes various habits that endorse physical and mental well-being, enhancing overall quality of life. Implementing healthy lifestyle habits, including maintaining a balanced diet, engaging in regular physical activity, getting sufficient and peaceful sleep, and avoiding harmful substances, among students, is a very effective coping strategy for alleviating academic stress. These habits not only enhance academic performance and reduce stress but also promote current and upcoming physical and mental health outcomes for students (Sánchez-Hernando et al., 2021). Adopting the following lifestyle habits can help students relieve academic stress.

1.9.3.1. Balanced diet. Maintaining a balanced diet is indispensable and provides students with enough energy needed to tackle academic challenges. Consuming nutrient-rich foods, such as fruits, vegetables, whole grains, and lean proteins, can help manage stress and reduce the likelihood of stress-related disorders (Muscaritoli, 2021). An unbalanced diet, insufficient vitamin intake, and excessive fat consumption can disrupt stress hormone regulation and overall quality of life, leading to various diseases such as high blood pressure, heart disease, and diabetes (Gonzalez and Miranda-Massari, 2014). A healthy diet is associated with improved mental health, while unhealthy eating habits can worsen the mental health of adolescents (O'Neil et al., 2014).

1.9.3.2. Regular physical activity. Engaging in physical activities is associated with higher well-being and lower stress levels across all age groups (Marconcin et al., 2022). These activities include walking, running, cycling, swimming, and various sports and exercises etc. For students dealing with academic pressures and stress, staying physically active can enhance their cognitive function, brain performance, and academic-related outcomes while reducing the risk of cognitive impairments (Erickson et al., 2019) and significantly easing the symptoms of depression and anxiety (Rebar et al., 2015).

1.9.3.3. Sufficient sleep. Peaceful sleep is essential for improved physical and mental performance. Students who go to bed on time and wake up early in the morning tend to perform better in their classes and achieve higher grades (Hershner, 2020). Sleep deprivation or irregular sleep schedules can significantly impact grades and mood, increasing the risk of academic failure and vehicle accidents (Hershner and Chervin, 2014).

1.9.3.4. Avoiding harmful substance. To manage academic stress and boost physical and mental well-being, students need to steer clear of harmful substances such as excessive fast food, tobacco, and alcohol. Substance use, such as smoking and drinking alcohol, is increasingly becoming a trend among students, negatively impacting their academic performance (Mekonen et al., 2017) and excessive usage of junk foods leads to various cognitive and mood deficiencies (Reichelt and Rank, 2017).

1.9.4. Study techniques

Study techniques are the actions and strategies students can use to enhance their learning, understanding, and retaining skills (Rowland, 2014) and reduce academic-related stress. Learning techniques are vital for managing academic stress as they improve efficiency and retention of course content. A study revealed that distributed practice and testing are the most effective techniques for improving students' learning, while summarization and underlining are the least effective methods (Donoghue and Hattie, 2021). Although learning techniques are simple and affordable ways to strengthen students' academic performance but don't provide solutions to all the stressors faced by students (Dunlosky and Rawson, 2015). The following techniques are primarily recommended for students to enhance their learning outcomes and manage academic stress.

1.9.4.1. Distributed learning practice. Distributed practice involves spreading out study sessions over various intervals rather than cramming all the studying into one long session. This practice is highly recommended as it is suitable for students of all ages and abilities to improve their performance in various tasks, especially in the academic sector (Dunlosky et al., 2013). Such as the Pomodoro Technique, which suggests breaking study time into short intervals, usually 25 min, followed by short breaks. It helps students stay focused and avoid burnout (Cirillo, 2006).

1.9.4.2. Testing practice. It refers to taking a practice test before the final exams to gain insights into students' learning and retention of course content. Students who take practice tests generally perform better than students who engage in other non-testing activities, such as reviewing or not going over the material (Adesope et al., 2017).

1.9.4.3. Spaced repetition. It is a technique of reviewing and recalling the study material or notes at gradually increasing intervals to boost long-term memory. Spaced review is a realistic and affordable way that

not only enhances the effectiveness of learning but also sharpens cognitive functions like problem-solving and memory skills (Kang, 2016).

1.9.5. Relaxation techniques

Relaxation techniques are the methods used to relax all the muscles, internal organs, joints, mind, and emotions of the individuals (Kassymova et al., 2018b). By fostering calmness, enhancing focus, and improving overall well-being, these techniques contribute to better educational outcomes. These strategies are well-known for their effectiveness in alleviating academic stress and anxiety and reducing the fear of failure (Manansingh et al., 2019). Students found practices such as mindfulness, problem-solving, and adopting a growth mindset valuable for managing academic stress (Vestad and Tharaldsen, 2022). It's important to remember to incorporate relaxation practices into students' daily schedules. These practices can significantly enhance their ability to manage academic-related stress and improve their academic success, and overall health. The following relaxation techniques have significant positive effects on students' mental health and academic outcomes.

1.9.5.1. Deep breathing. This is a simple exercise that involves taking slow and deliberate breaths, in and out and improves physical and mental fitness by releasing tension from the body. This relaxation technique boosts mood and decreases the levels of stress (Perciavalle et al., 2017). It is a direct and rapid method that students can quickly learn and apply to ease the unsafe impacts of stress and anxiety related to exams. This can positively affect their mental health and academic performance (Khng, 2016).

1.9.5.2. Progressive muscle relaxation (PMR). It is widely accepted as an intervention aimed at reducing mental health problems. Various studies have shown that this practice is effective in decreasing the levels of stress, anxiety, and depression among teenagers (Muhammad Khir et al., 2024). This practice assists students to become more conscious of physical tension and teaches them ways to remove it. PMR significantly reduces test anxiety, stress, and depression and helps learners to better cope with academic hurdles (Gangadharan and Madani, 2018).

1.9.5.3. Mindfulness meditation. It involves focusing on the present moment and helping students reduce overthinking associated with the future. Mindfulness-based interventions are widely used for stress reduction and are effective in relieving psychological distress and anxiety among students (Bamber and Schneider, 2016). They also help enhance students' resilience, satisfaction, and ability to regulate their emotions (Green and Kinchen, 2021).

1.9.5.4. Yoga. This relaxation technique combines physical postures, meditation, and breathing exercises to reduce psychological distress by boosting physical relaxation and mental concentration. Reduction in stress and anxiety levels among students can be achieved by practicing yoga, even if not done frequently, doing it once a week could be beneficial (Lemay et al., 2019).

2. Method

The electronic search was conducted manually using the keywords 'stress' 'academic stress' 'sources of academic stress' academic stress among students' 'sources of academic stress' 'detection of stress' 'impacts of academic stress' 'coping techniques' 'time management techniques' 'stress reduction techniques' 'mindfulness meditation' 'study techniques' 'progressive relaxation techniques' 'healthy lifestyle' etc. The selected studies span the past decade, with very few articles drawing on findings from earlier research. The articles were gathered from online databases, primarily Google Scholar, PubMed, and Taylor & Francis. This review broadly covers the topic of academic stress, focusing on understanding its causes, types, symptoms, methods of detection, and its effects on students' mental and physical health. It also includes a thorough discussion of coping strategies that students can utilize to effectively manage stress.

3. Analyses

During the learning period, students frequently encounter situations that may cause them to feel mildly stressed or anxious due to minor or significant changes. Academic stress is therefore a significant aspect of the learning journey that affects everyone. Mental stress in academia is an increasingly major issue. The study period was once considered the most lighthearted and relaxed but now is under great pressure from various burdens, causing stress that heightens the risk of depression, heart attack, suicide, and stroke among students (Ahuja and Banga, 2019). In recent years, it has become a more pressing problem for students that arises from a combination of internal and external factors. The main stressors include domestic problems, overthinking about the future, rising educational competition, interaction with mentors, peer and family pressure, educational environment, and financial strains (Hosseinkhani et al., 2020). It can either serve as a motivator or become a stumbling block to the growth of students and its level rises with the increase in academic demands. During the second phase of the academic period, students reported higher levels of stress due to domestic issues, institution rules, educational system, career insecurity, instructor interaction, and financial burdens compared to the first phase when the only stressor for students was increasing educational competition (Hosseinkhani et al., 2021). Levels of stress in academia are also related to sexual characteristics and regions of students. A study revealed that non-indigenous students tend to undergo higher levels of stress than Indigenous students (Sahu and Jha, 2020). Similarly, numerous studies have shown that female students experience higher levels of academic stress compared to their male counterparts (Calaguas, 2011; Ye et al., 2018; Banu et al., 2015; Garett et al., 2017b).

Academic stress can escalate to alarming levels and has significant effects on the physical, mental, and emotional well-being of students and their academic performance. It is crucial to assess stress to prevent negative outcomes promptly. Psychological tools such as self-report surveys and interviews are widely used to evaluate stress levels among students (Jiménez-Mijangos et al., 2023b). Detecting stress among learners enables professionals to recommend a management plan based on their stress status. Developing effective strategies to manage stress at the educational level requires a thorough understanding of stressors, signs, stress level (mild, moderate, severe), and their impact. Therefore, it is necessary to address stress management at personal, social, and institutional levels (Reddy et al., 2018). By implementing a comprehensive approach, learners can get the mandatory support to cope efficiently, boost academic performance, and enhance mental and physical well-being. Moreover, stress can also be manageable by introducing a specific course related to stress management. Extramural bodily and mental doings are also ready to lend a hand in relieving stress among students as well as teachers (Travis et al., 2020). Furthermore, educational bodies can also organize seminars, workshops, and training sessions to educate parents, teachers, and students about the prevalence of academic stress. This can help them understand its nature, identify its sources and signs, and offer appropriate guidance. By embracing an inclusive approach, students can develop the skills necessary to effectively tackle challenges, attain academic success, and maintain a healthy balance in their academic and personal lives.

4. Conclusion

Academic stress is a significant disturbing multi-factorial issue, stemming from different academic and individual factors. As students go through their study tenure, they encounter a myriad of stressors ranging

from strained relationships to academic workload and rising educational demands. Various physical and psychological signs express these stressors that can impede students' personal, educational, and career opportunities. Addressing academic-related stress requires collaborative efforts across multiple fronts to empower students with the support and assets they need to excel academically and emotionally. After reviewing numerous articles published over the last decade, this review thoroughly covers every aspect of academic stress. It delves into the intricate nature of stress in academia, revealing its different internal and external sources, symptoms, tools for assessing stress levels, and its physical, psychological, and educational impacts. This article also emphasizes the necessity of implementing effective strategies to manage academic stress efficiently. The solutions and techniques recommended in this review should be actively espoused by students and educational organizations to mitigate stress, as these can lead to a healthier, more balanced academic experience.

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Informed consent

This review article does not contain any studies with humans and animals performed by the author so ethical approval or informed consent was not required because this is a review of existing literature and does not involve data collection. All data referenced in this review are available and duly cited.

Availability of data and material (data transparency)

All the data enclosed in the article was available on the internet which was searched & collected by using relevant keywords.

CRediT authorship contribution statement

Iqra: Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

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