



The Impacts and Likelihood of Academic Burnout on the Mind and on the Body of Students With and Without Attention Deficit Hyperactivity Disorder (ADHD)

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Abstract

Although academic burnout is becoming increasingly more relevant for adolescents in school, the relationship between burnout and attention-deficit hyperactivity disorder (ADHD) has not yet been extensively studied. This research aimed to measure academic burnout in students, and to compare symptom prevalence between students with and without ADHD.

46 international students aged 14–18 studying either the International Baccalaureate's Diploma Programme (DP) or the Middle Years Programme (MYP) were administered by using six standardised questionnaires that assessed academic burnout and other related factors such as perceived stress, self-efficacy and sleep quality. The questionnaires were the PSQI, the PSS, the Brief COPE, the GSE, the MSPSS and the BAT-S. Five participants reported a diagnosis of ADHD. Then, the data was compared between students with and without ADHD, and correlational analyses were conducted to explore any relationships between burnout and other measured variables from the remaining 5 questionnaires. The research found no statistically significant differences in academic burnout between students with and without ADHD. However, burnout was positively correlated with perceived stress and sleep problems across all students.

While ADHD status was not associated with higher burnout in this sample, the small number of participants with an ADHD diagnosis limits the strength of conclusions that can be drawn regarding the role of ADHD. The findings suggest that ADHD alone may not strongly predict academic burnout in adolescents. Instead, stress levels and sleep difficulties play a more central role in burnout development. This supports the need for personalised interventions that target stress management and sleep quality for students. This is regardless of receiving a diagnosis. Therefore, contributing to a broader understanding of how academic burnout can be prevented.

Keywords

Academic burnout; Attention-deficit hyperactivity disorder; Sleep quality; Self-efficacy; Academic stress; Physical well-being; Mental health; Mental well-being; Physical impacts; Psychological impacts; Burnout

symptoms; ADHD symptoms; ADHD traits; ADHD diagnostics; Inattentive ADHD; Hyperactive ADHD; Combined ADHD; Educational standards; Educational accommodations; Educational expectations; Neurodiversity; Neurodivergence; Neurodivergent accommodation; Neurodivergent resources; Student well-being.

Introduction

The Problem Associated with Academic Burnout

In today's modern age of education, the issue of academic burnout has only become increasingly more prevalent in students in various academic settings, such as high school and at college. As competitions and internal academic standards worldwide continue to increase, students facing personal burnout is a strong possibility. Without proper coping strategies, it can be easy for them to neglect their physical and mental health and well-being. This in turn can result in them experiencing academic burnout.

On another level, in a world that is shaped for people to fit certain ideals and structures, neurodiverse individuals, including those with attention-deficit hyperactivity disorder (ADHD) can struggle to understand and cope with the pressure of facing academic burnout. In addition, working in a system that does not allow or support neurodiverse youth with the opportunities to learn effectively, may subsequently place them at a higher risk for facing academic burnout on their own.

Defining Academic Burnout

The most widely referenced definition of burnout was defined by social psychologist Christina Maslach (Whitcomb, 2025) as “emotional exhaustion, reduced personal accomplishment, and depersonalization” (Maslach et al, 1982, p.3). In saying that, the definition was first established in the context of an occupational rather than an educational setting by psychologist Herbert Freudenberger in 1974 (Michel, 2016). In 2021, another definition was developed for burnout by the ICD-11 as “exhaustion due to prolonged exposure to work-related problems” (Bianchi & Schonfeld, 2023, p.2). It is important to note that this definition and the more recent and updated definitions have received a fair share of criticisms in terms of capturing the essence of what academic burnout actually involves. When discussing academic burnout, it is recommended to build a definition by discussing both the specific physical and psychological impacts that academic burnout can have on individuals.

The Impacts of Burnout

The psychological impacts of burnout have been documented to include feelings, such as hopelessness, exhaustion, powerlessness, detachment, a lowered sense of self-esteem, general cynicism and dissatisfaction towards work, and a sense of reduced accomplishment (Khammissa et al., 2022; & WebMD Editorial Contributor, 2024). This is a result of failing to meet one's own occupational expectations. These expectations can often be internally established by the individuals, and might relate to work performance.

Furthermore, other symptoms of burnout can include withdrawal from hobbies, feelings of detachment, anxiety, constant mental fatigue and difficulty concentrating on tasks. There can be a lack of motivation, decline in critical thinking and creativity skills, reduced academic performance, and weakened physical health (Mental Health America, n.d.). It is important to know that although burnout is commonly associated with depression and anxiety, and while the symptoms of these two conditions can occur in burnt-out individuals, they are separate physiological states (Khammissa et al., 2022).

The Connection Between Burnout and Observed Symptoms

In addition, burnout is associated with physical symptoms, such as having frequent headache, gastrointestinal issues, such as heartburn, bloating, nausea and diarrhea (Hammarström et al., 2023). In addition, respiratory issues, for example shortness of breath and tightness in the chest due to the stress response, sleep impairment, difficulties maintaining concentration, and accurate short-term and working memory (Gavelin et al., 2021). This is because of the effects that chronic stress has on the brain as a result of burnout. Stress causes increased levels of the hormone cortisol to be released into the brain, which elevates the heart rate and causes more blood flow to the muscles (American Psychological Association, 2018). However, prolonged cortisol secretion can cause neural connections in the amygdala to strengthen, and conversely the connections in the hippocampus to weaken (Murgia, 2015). Amygdala refers to the area which is most associated with fear and anger. Hippocampus is responsible for memory consolidation.

Understanding Attention-Deficit Hyperactivity Disorder (ADHD)

Though ADHD is medically defined as a disorder, a more appropriate definition would be that attention-deficit hyperactivity disorder is a permanent difference in brain structure with stunted maturation or development in certain parts of the brain (Sripada et al., 2014). This incorporates the prefrontal cortex, which regulates impulsivity, reward-based decision making, and the ability to pay attention (Haber & Robbins, 2021). This part of the brain is known for being the main regulator of executive functions. This can be defined as skills that help people carry out everyday tasks in connection to self-organisation, managing emotional responses and impulses, problem-solving and planning skills (Cleveland Clinic, 2024).

ADHD is a condition that a person is born with, and is influenced by both genetic and environmental factors. A family history makes it more likely for an individual to develop ADHD. However, genetics alone might never determine whether ADHD will or will not manifest. Numerous studies pinpoint the fact that ADHD is caused by the interplay of genetic and environmental factors. Certain genes inherited from an individual's parents, when exposed to certain environmental changes, such as prenatal smoking, stress, and alcohol use, affect the prevalence of ADHD symptoms throughout an individual's life (Han et al., 2015; Grizenko et al., 2008; Linnet et al., 2003). It should be emphasised that a certain set of genes nor a certain environmental condition will guarantee a presentation of ADHD in an individual. Rather, it is the interactions between these two factors that cause its manifestation (Mate, 2019).

ADHD symptoms are documented as diagnostic criteria in the fifth edition of the Diagnostic Statistical Manual (DSM-5) as either belonging to the inattentive or the hyperactive category (American Psychiatric Association, 2013, p. 59 – 60). Inattentive symptoms usually include missing close details, not listening when spoken to

directly, trouble with organisation, and forgetfulness. Hyperactive symptoms include physical restlessness, such as frequent fidgeting, interrupting before others finish speaking, and trouble waiting their turn (Williams, n.d.). According to research, there is a combined type, where individuals can have symptoms of both types of ADHD.

To diagnose ADHD, a registered healthcare provider can conduct psychological assessments by using interviews and questionnaires. In saying that, the main decisions are made based on the clinical interviews. They will assess the potential symptoms of ADHD alongside the DSM-5: for children up to 16 years, 6 or more symptoms of inattention or hyperactivity are required for a diagnosis. 5 or more symptoms are required in adults aged 17 or older (CDC, 2024). As ADHD is a condition that one is born with, rather than one that develops later on in life, acquiring a diagnosis requires inattentive and/or hyperactive symptoms to be present before the age of 12 years.

Furthermore, there should be evidence that these symptoms are severe enough to reduce the quality of life of the individual in different aspects, such as social, school and/or work life. As many symptoms of ADHD can overlap with other mood disorders or learning differences, diagnoses need to be made carefully, considering medical records, family history, and any context behind the symptoms to ensure that healthcare providers do not confuse ADHD symptoms as being caused by another condition entirely.

The Importance of the Research

Given the gradual but prevalent destigmatisation of mental health conditions and developmental disorders over the past few decades, emerging research has shown correlations between ADHD and developing academic burnout. In saying that, currently there is not enough research to pinpoint a conclusive link between the two factors. Most findings on the topic have been derived from studies with small sample sizes. Most standardised inventories for burnout are targeted towards adults. Thus, more research exists that studies adults working in occupational settings rather than adolescents and younger students in school settings.

In light of this, the purpose of this research is to expand our current scientific knowledge regarding ADHD in education settings. The goal of this research is to highlight interventions that can be developed to further support neurodiverse individuals in regards to their mental well-being. Presently, traditional educational methods may not be well-suited for those with ADHD, which may increase the chance of burnout. Often the students with learning differences do not thrive as well in traditional school structures that follow classroom behaviours, such as having sustained attention, quietness, the ability to follow multi-step instructions and high academic performance (Agustin, 2025). This is because these factors are aspects that students with ADHD struggle with.

Hypothesis

The study hypothesises that students with ADHD of either inattentive, hyperactive or combined presentations would exhibit increased symptoms of academic burnout. This change will be mostly observed in the student burnout questionnaire (BAT-S), given that it is a general questionnaire to quantify burnout symptoms. As sleep quality is strongly related to the development of academic burnout, sleep quality will be poorer in groups with

ADHD. However, it should be noted that participants regardless of a diagnosis are more likely to have poorer sleep quality with more symptoms of burnout.

Questionnaires, such as the GSE, the Brief COPE and the MSPSS, may have less variation between both groups. This is given that self-efficacy and social support are factors that are mainly defined by individual differences and circumstances which have not directly affected, or are affecting a diagnosis of ADHD. There will be variation between all participants depending on individual differences. However, between the two groups there will be increased symptoms in participants with ADHD. Students with ADHD are more likely to experience difficulty in social situations, which in turn would affect the development of their social support. Additionally, many people with ADHD have been reported to have a lowered sense of self-esteem, which can potentially affect self-efficacy and their sense of optimism. One of the main characteristics of ADHD is impulsivity: this can result in an increased likelihood of making habits of riskier and more impulsive coping behaviours.

Goals and Objectives of the Study

This research aims to survey participants across multiple factors, including self-efficacy, sleep quality and perceived stress. These factors are linked to burnout, and will help present a clearer and more detailed perspective about the effects of burnout on the student sample. In addition, gathering data about these aspects will help recognise potential secondary patterns in individuals with or without ADHD. The study's goal is to collect a sample of high school students' responses about the likelihood of experiencing certain symptoms associated with burnout. The related factors will be analysed and tested for significance to find any correlations.

This paper aims to explore the multifaceted aspects of burnout amongst neurodiverse student populations. By recognising any potential correlations, the paper may be able to develop a stronger knowledge for potential accommodations or treatments for schools worldwide. This can be achieved by establishing strategies that target aspects that students with ADHD may struggle with the most. Therefore, more efficient approaches may be created.

Furthermore, this study will take into account the statistics and proportions of students with ADHD. Though statistics of neurodiverse students will differ across every school, through appropriate data analysis, the study can highlight how more supportive environments for students of a representative minority group can be built.

Literature Review

Overview of Current Research

It is important to note that the fields of mental health and neurodiversity are progressively destigmatising. The most existing knowledge about neurodiversity has only been conducted in recent years. Thus, studies about ADHD and burnout have not been extensively documented. Moreover, limited research exists that demonstrates a conclusive link between ADHD and burnout. Despite this, some current research moderately supports the claim that having ADHD can lead to a higher risk for burnout. Logically, this correlation can be explained through the hypothesis that people with ADHD tend to have problems with executive functioning,

which would impair time management skills and prioritisation. Therefore, dysregulated executive functioning can cause increased stress as students can miss classwork and/or assignment deadlines. This, in turn, can lead to feeling overwhelmed, which can ultimately lead to burnout.

It is important to note that most research about ADHD and burnout currently exists in self-reports. Although quantifying burnout or ADHD symptoms are harder to include in methods not including self-reports, these studies are still subject to bias from the participants and the researcher's perspective. This is due to the nature of the research design. Furthermore, many self-report studies collect data from one point in time, which cannot represent the entire population's life. As different stages of a person's life will have varying workloads, this study considers certain age groups to be more susceptible to burnout compared to other groups. For example, a study by Lu and Gursoy (2013) demonstrated that during emotional exhaustion, older generations, such as millennials, reported lower job satisfaction than baby boomers. This is potentially due to different generational perceptions of emotional exhaustion and varying definitions of burnout.

Therefore, it should be noted that studies usually measure data from one specific group of people within a certain age range. Although most research on ADHD and burnout occurs in educational settings, there are studies that collect data from elementary school and university students compared to high school students. Research on academic burnout in high school students is less documented. Furthermore, numerous similar studies use adult sample sizes and measure burnout that exist in workplace settings. This is due to the fact that the first definition of burnout was first established in the context of developing chronic workplace stress.

Burnout and ADHD are relatively emerging terms that have undergone alterations over recent years. This is because knowledge about the two terms is recent. Thus, new discoveries may quickly support or refute any current findings. On another level, ADHD is also a recently termed condition. Therefore, this indicates limited research that is available for burnout and ADHD individually, and even less information which is accessible on the potential correlations of both the aspects. Furthermore, it is crucial to note that the measured quantities of ADHD diagnosis are currently not representative of the proportion of the population with ADHD, as the opportunities to get diagnosed is not available for all parts of the world. This is because economic factors play a part in ADHD diagnoses. According to research, currently, most research samples participants who are white, male and come from high-income countries (Merrill et al., 2024, Song et al., 2021).

In addition, proper awareness of the condition is not yet fully understood by people in different parts of the world. As neurodiversity is an emerging field, longer-lasting longitudinal studies are needed in the future to guarantee more reliable conclusions and track patterns over time with greater accuracy. Additionally, a greater frequency of studies with adolescent sample sizes may provide useful insights into learning differences. This is given the high level of neuroplasticity in high school students: adolescent samples may have varying levels of correlation compared to other age groups.

Analysis of Methodologies in Current Research

Though current research in ADHD has been documented to utilise a variety of methods, the most commonly used methods are conducting interviews with people who are diagnosed with ADHD and/or their family members and loved ones, diagnostic self-report scales, and conducting peer review of journal articles. In terms

of interviews, first participants are interviewed by a licensed healthcare professional to analyse common themes and mentions of any symptoms. Then, participants are given self-report questionnaires to support the evidence from the interview. Decisions are made in reference to the DSM-5, which includes diagnostic criteria of symptoms that define any of the three types of ADHD. The collected evidence will determine whether the participant receives a diagnosis for ADHD (CDC, 2024).

It is important to note that other methods of data collection have been documented. For instance, cognitive and behavioral tests, and genetic studies (Faraone and Larsson, 2006). Moreover, other methods of data collection include neuroimaging using electroencephalography (EEG) or functional magnetic resonance imagery (fMRI) technology (Snyder et al., 2015; Cortese et al., 2012). On another level, longitudinal studies and overall meta-analyses can analyse the validity and reliability of pre-existing ADHD studies exist in current research on broader scales (Cortese et al., 2022; Popit et al., 2024).

Cognitive and behavioral tests are assessments that usually measure factors related to ADHD, such as executive function, attention, memory and impulse control. Some examples of these tests include continuous performance tasks (CPTs) that measure attention and vigilance. This is where participants will respond to target stimuli and refrain from responding to non-target stimuli over a measured amount of time. This measures decision making, reaction time, inattention and impulsivity (Conners, n.d.).

Similarly, inhibitory control tests are used. They are known as Go/No-Go tasks. This is where participants are asked to respond to 'Go' stimuli and ignore 'No-Go' stimuli (Diamond, 2013). To test executive function, the Stroop test is used. This is where participants are presented with words that are colored either accordingly. For example, the word 'blue' coloured in blue, or the word 'blue' being coloured in red. Participants have to answer based on the color that they see, rather than the word itself, in as little time as possible (Li et al., 2024). On another note, working memory can be tested through the N-back test or the digit span test (Jones et al., 2024; Ramos et al., 2019). The tests allow participants to recall a list of items from recall sequences of items from 'n' steps back, or sequences of numbers counting forward or backward, respectively.

Neuroimaging technology, EEG and fMRI are used to measure brain activity in different regards. EEG tests can measure the electrical impulses of the brain by connecting the scalp to electrodes. Thus, connecting to an EEG device. It is responsible for measuring the electrical signals of specific areas of the brain. The EEG records data of brain waves, which could change frequency depending on different types of sleep or focus (Artinis Medical Systems, 2024). EEG technology is used to monitor brain activity and the functioning of specified brain areas.

fMRI technology indirectly measures neural activity by monitoring the changes in blood flow. This is done by measuring the ratio between deoxygenated and oxygenated blood in different areas of the brain. This flow is measured by using a strong magnetic field. This aligns hydrogen nuclei from water in the brain's cells, which causes magnetic signals from the individual atomic nuclei to be measured. The strength of the magnetic signal in a specific part of the brain corresponds to increased blood flow. These changes are interpreted as reflecting increased activity in that area (The Open University, 2022).

To investigate the genetic heritability of ADHD, both twin and family studies are usually conducted. This is done by comparing traits among family members - usually through structured interviews, collecting data from twin registries and/or questionnaires (Sahu, 2024). Then, the collected data is analysed for prevalence and heritability from generations. Research cited by Faraone and Larsson (2006) state that mean heritability using 37 twin studies on inattentiveness and hyperactivity range from 74-80%. Despite this, the study supports the idea that genetics alone cannot guarantee the manifestation of ADHD, and any specific genetic variant has not yet been found to cause ADHD.

Therefore, our understanding of ADHD, especially the biological interactions between the conditions are currently not as developed or progressive. Most research assesses participants based on their symptoms, and biological markers are rarely used in the investigations. Biological markers are defined as measurable indicators in the body that can signal the processes of a cell or organism at a given moment (NHI, n.d.). These can come in the form of any measured bodily function, such as blood pressure, cholesterol levels, or changes in brain activity. In the context of ADHD, markers are usually taken from neuroimaging, such as reduced volumes of brain areas. This includes the prefrontal cortex and basal ganglia (Rubia et al., 2021). Alternatively, brain activity in pathways of the brain, such as the front-striatal networks as measured by using fMRI (Rubia, 2018). By using EEG, ratios of theta to beta brain waves can be measured, and specific genes could be identified which relate to dopamine activation (Kopańska and Trojaniak, 2025; DiMaio et al., 2003). Despite this, there is currently no existence of a reliable and certain biological marker for ADHD.

Given how common symptom heterogeneity is for ADHD, due to reasons, such as comorbidities (symptoms overlapping with other conditions) and other individual differences based on culture and environment, there are consequently some validity concerns about the methodologies. As a result, research about other underlying factors aside from genetics surrounding ADHD is quite limited.

The Occurrence of ADHD in Different Age Groups

Numerous studies have reported that people with ADHD have more work-related problems. Additionally, people who demonstrate inattentive symptoms can demonstrate a stronger correlation to work-related difficulties. Compared to 5-9% of the population reporting experiencing impairments in work, around 37-53% of participants with elevated symptoms of ADHD reported impairments (Fuermaier et al., 2021). A 2005 survey demonstrated that those with ADHD were around 2 times more likely to take sick leave, or be involved in workplace accidents (Kessler et al., 2008). They displayed around a 5% average reduction in work performance. Additionally, another study pinpointed around 22 working days' worth of lost performance (De Graaf et al., 2008). This could potentially explain why less individuals with ADHD are in paid work. Instead, they are in training or focusing on higher education (Faraone and Biederman, 2018).

The Validity of Quantity of Diagnoses

It is important to note that only in recent years, diagnosis rates have become more prevalent. This is due to the slowly destigmatising nature of the mental health field. Furthermore, diagnoses are only available to people who have enough financial income and stability. Therefore, certain groups of people, such as

older people or people living in poverty, can live their lives without being diagnosed with ADHD. A study measuring symptoms of ADHD in the USA displayed that symptoms often correlated with “male, previously married, unemployed, and Non-Hispanic White” citizens (Kessler et al., 2006). It should be noted that there is a difference between prevalence of ADHD diagnoses and ADHD symptoms. A study conducted in Japan illustrated that out of a sample of 2945 children between the ages of 10 and 12 years, “overall, 91 participants had persistent ADHD symptoms; however, 76 (83.5%) had no history of an ADHD diagnosis” (Okumura et al., 2019, p.1).

Overall, the nature of ADHD is very elusive, considering that current research and knowledge is still developing. However, numerous studies have pinpointed that ADHD is influenced by a variety of biological and environmental factors. However, neither of them directly guarantee manifestation of ADHD. According to a meta-analysis about reviews surrounding ADHD, it is observed that there is ‘methodological variation’ in terms of the literature that is concerning the number of diagnoses for ADHD (Gavelin et al., 2021). Out of 1156 reviews related to ADHD, only 231 existed that were not duplicates. 28% of the reviews were about medical interventions, and took place in Western places, such as Europe and United States of America. Out of the 231 reviews, 59% were high quality according to established review criteria, consisting of 9 items that checked for levels of bias. With the recent growth in the field, the amount of research from 2020 onwards is stressed to be more prevalent and reliable. Although an increasing amount of research has emerged in recent years, there are still some gaps in knowledge in terms of understanding prevalence and risk factors. Therefore, highlighting that the exact causes and proportion of people with ADHD is not certain.

Furthermore, it should be noted that ADHD is a harder condition to diagnose objectively as the symptoms of ADHD can overlap with pre-existing conditions, such as other mental disorders. For instance, people can be diagnosed with anxiety, depression, and/or autism. This is because of the similar symptoms which can often manifest. Conversely, other conditions can be misdiagnosed as ADHD, such as absence seizure disorder, diabetes, thyroid dysfunction, sleep deprivation, post-concussion states, inflammatory bowel disease, iron deficiency states and anemia, and disordered breathing.

Diagnoses are made on subjectivity, and psychologists usually have to make a diagnosis based on the extent to which they see the individual’s symptoms interfere with their daily life (Gualtieri and Johnson, 2005). Not only should the individual have experienced prevalent symptoms to a certain degree and past a certain frequency for a diagnosis to be made, but these symptoms must have occurred throughout childhood. This indicates that when diagnosing ADHD, the context of the diagnosis needs to be closely examined to ensure that any symptoms are not due to either a preexisting condition or an unexpected life event, which may exacerbate symptoms associated with ADHD.

Methodology

Collection of Data

To collect relevant and accurate data, a survey was constructed that contained questions using standardised instruments. These instruments contained questions about a range of factors that aimed to measure academic burnout throughout different aspects. The survey was a multiple-choice survey that rated responses on a Likert

scale, and was distributed to 46 high school students in an international school, 5 of which had a diagnosis for ADHD (3 with the inattentive presentation and 2 with the combined presentation). The sample was taken from students studying the IB curriculum. This included MYP 4 - 5. This method of data collection was used to collect a wide range of responses from a large sample size quickly and easily to identify any consistencies or patterns in the data. Additionally, using Likert scales to quantify symptoms of burnout allowed for patterns in data to be analysed efficiently and objectively without having to identify recurring themes as compared to alternative methods, such as interviews. Participants were asked early in the questionnaire if they had an official diagnosis for ADHD and the type that they had. Furthermore, they were asked to report if they had any other neurodivergent condition. Any additional data that did not encapsulate ADHD was only used for internal reference, and excluded from any data analysis.

In addition, at the high school that the sample originated from, interviews were conducted with the faculty head of well-being and the secondary student counselor to prepare for the research process. Interviews were unstructured and informal, and took place in the school offices. Questions were related to current neurodivergent accommodations at the school, and logistical concerns when conducting the data collection. Furthermore, a similarly structured interview was conducted in school with the school's learning diversity coordinator, where the discussion concerned the proportion of students with confirmed diagnoses for ADHD in each year. Out of the IB cohort, 15 students had ADHD (10 in IB2 and 5 in IB1) out of approximately 250 students in the cohort. 6 had ADHD in the MYP cohort (4 in MYP 5 and 2 in MYP 4).

For additional information and research, an interview was conducted with a certified therapist, who herself was diagnosed with ADHD. The interview was unstructured, recorded and lasted for approximately an hour. Though the interview was not explicitly referenced in the research process, it provided a guideline to the background research of both ADHD and burnout, as questions were related to personal experiences with ADHD and burnout, as well as current accommodations that can be implemented in schools to further assist neurodivergent students.

The survey utilised questions from six standardised instruments: the Pittsburgh Sleep Quality Index (PSQI), Perceived Stress Scale (PSS), Brief COPE, General Self-Efficacy Scale (GSE), Multidimensional Scale of Perceived Social Support (MSPSS), and the Burnout Assessment Tool for Students (BAT-S).

The PSQI is a widely-referenced self-report questionnaire that analyses sleep quality over one month and gives one score to summarise how well an individual has slept (University of Pittsburg, n.d). As disturbances in sleep quality and sleep cycles are important indicators of burnout, it is important that sleep is reliably assessed. On another note, the PSS is a questionnaire which has been cited over 30,000 times since 1983. It asks participants to rate their feelings and thoughts over a one-month period. PSS contains questions which measure the participant's perception of how uncontrollable their circumstances are. Thus, scoring their perception of stress in their daily lives over the past month (Harris et al., 2023). As a sign of burnout is emotional exhaustion, including feelings of helplessness or being overwhelmed, assessing a participant's general sense of control will help reliably to quantify burnout.

The Brief COPE measures coping strategies by categorising participant responses against 3 categories: problem-focused, emotion-focused and avoidant coping. Thus, quantifying the effective and ineffective coping

strategies used by participants, and 14 individual sub-dimensions within these categories. This is ranging from acceptance and planning to substance abuse and self-blame (NovoPsych, n.d.). The Brief COPE measures the resilience of a participant when exposed to factors that may cause burnout. This gives useful insights into burnout symptoms, as it offers a closer look at the likelihood of participants developing burnout, even when exposed to the same risk factors.

The GSE is used to quantify overall self-efficacy across one dimension through questions on emotion, satisfaction and optimism. It additionally includes questions about how participants may cope with stressful or unexpected events. Due to the fact that the questions can be applied widely to many cultures, the GSE has been translated into over 28 languages (Dahlberg et al., 2022). The GSE was included, as research has demonstrated that optimism is a strong factor in determining burnout throughout both occupational and educational settings (Yao et al., 2018).

The MSPSS measures perceived social support from 3 categories of people in the participants' life: family, friends and a significant other (Greenspace, n.d.). It has proven to have good reliability across many cultures. Therefore, it has been adapted into other contexts, such as nurses and patients with multiple sclerosis (Efthymiou et al., 2025). The MSPSS has been included, as maintaining a strong support system, and it is a crucial tool for recovering from burnout (Cherry Tree Therapy Centre, 2025).

The BAT-S is an adaptation of the Burnout Assessment Tool (BAT) for students established in the Netherlands, and is a validated questionnaire that quantifies the risk for burnout. Although it is not as widely used as the BAT in scientific publications, the BAT-S still possesses high reliability as an adaptation, and has officially been translated into 4 languages (Burnout assessment tool, 2020). The last questionnaire rates burnout risk as one score, and the remaining instruments are necessary to be able to take a closer look at not just as burnout, but the other factors that play a role into the development of academic burnout. These tools allowed signs of burnout to be evaluated, and other factors that would be impacted by burnout as reported by participants.

The first section of the survey aimed to collect basic demographic information, such as age, highest level of education completed and nationality. All data was kept confidential and anonymous. For example, mail addresses were not collected. Participants were asked to give consent and the right to withdraw their data at any time. One of the questions asked participants if they had an official diagnosis for ADHD, which was used to determine the sample size of students with ADHD compared to those without ADHD. After the data collection, responses of each participant were scored according to the standardised criteria of each questionnaire, and analysed for any prevalence in symptoms. Within each questionnaire, each response on the scale was given a number (for instance, 5 for often and 1 for never). The scores were added or averaged according to the individual criteria for the PSQI, PSS, Brief COPE, GSE, MSPSS and BAT-S to find the total scores for each participant. Furthermore, any correlations in increased symptoms between those with ADHD and those without ADHD were noted.

However, it should be noted that there are some limitations with the data collected: for example, participants with ADHD were not asked if they were medicated. As symptoms of ADHD can be managed to a certain extent through the use of medication, this potentially introduced another uncontrolled variable that would have affected the reliability of the results. Thus, making it less valid to claim any differences were due to the

independent variable. In future replications, this should be accounted for. Furthermore, as the online form did not require each question to be filled out by participants, some responses were omitted from the data analysis because they were incomplete.

Sample Size and Improving its Reliability

Overall, it should be noted that the sample size of the study is not representative of a single population: out of the 21 total students with ADHD in the two cohorts, responses were only gathered from 5. The total was only around 24% of the total neurodivergent population in the school. Even considering the full sample size, data from only one international high school cannot be generalised to a whole population, as the students would not have similar socioeconomic status, and potential cultural factors could affect the masking of certain symptoms of ADHD. To further improve reliability in future replications, questions should all be made compulsory to answer, and surveys could be potentially extended to other schools to widen the net. Additionally, other forms of data collection could be implemented, such as cognitive or memory tests, though logistically this may prove to be more challenging with a wider sample size.

Findings and Discussion

Analysing the Exclusion Criteria

Participants who submitted incomplete responses were excluded from analysis. Therefore, out of the 46 total participants, analysis was included for 38 students, comprising 33 with ADHD and 5 without ADHD. Participant scores were made according to each questionnaire's scoring: larger scores in the BAT-S, sleep-difficulty, perceived stress and maladaptive coping scores indicated worse outcomes. Higher self-efficacy and social support scores indicated better functioning.

Details about the Scores

Across the overall sample, questionnaire totals were as follows: burnout (BAT-S total), $M = 102.33$, $SD = 22.47$, $n = 42$; sleep problems, $M = 13.00$, $SD = 6.12$, $n = 46$; perceived stress, $M = 24.68$, $SD = 5.54$, $n = 44$; self-efficacy, $M = 28.21$, $SD = 4.70$, $n = 42$; social support, $M = 62.95$, $SD = 12.25$, $n = 42$; and maladaptive coping, $M = 19.91$, $SD = 7.92$, $n = 46$.

To determine whether results were statistically significant, t-tests for independent samples were conducted. Across all questionnaires, independent t-tests showed no statistical difference between the groups with and without a diagnosis.

Burnout was the primary dependent variable. A t-test indicated that students with ADHD did not report significantly higher levels of burnout than students without ADHD. Means were similar across the groups, $t(33) = -0.22$, $p = .83$, Cohen's $d = 0.12$ (ADHD: $M = 102.50$, $SD = 23.01$, $n = 4$; No ADHD: $M = 99.74$, $SD = 23.59$, $n = 31$).

A t-test comparing sleep scores demonstrated no significant difference between ADHD and non-ADHD groups, $t(36) = -0.28$, $p = .78$, $d = 0.13$. Students with ADHD reported slightly greater sleep difficulty ($M = 12.80$, $SD = 3.11$, $n = 5$) than those without ADHD ($M = 11.97$, $SD = 6.53$, $n = 33$), but the effect was small. Perceived stress did not significantly differ between ADHD and non-ADHD students, $t(34) = 0.75$, $p = .46$, $d = -0.36$. Means indicated comparable levels of perceived stress (ADHD: $M = 22.40$, $SD = 6.31$, $n = 5$; No ADHD: $M = 24.45$, $SD = 5.62$, $n = 31$).

Self-efficacy scores were nearly identical across groups, $t(33) < 0.01$, $p = .99$, $d < 0.01$ (ADHD: $M = 28.75$, $SD = 4.79$, $n = 4$; No ADHD: $M = 28.77$, $SD = 4.62$, $n = 31$), showing no evidence of reduced self-efficacy in the ADHD group. Perceived social support did not differ significantly between students with and without ADHD, $t(33) = 0.42$, $p = .68$, $d = -0.22$. Students with ADHD ($M = 61.25$, $SD = 7.41$, $n = 4$) showed slightly lower support than students without ADHD ($M = 63.87$, $SD = 12.00$, $n = 31$), but the difference was small and non-significant.

A t-test showed no significant differences in maladaptive coping scores between ADHD and non-ADHD students, $t(36) = -0.63$, $p = .53$, $d = 0.30$. Means indicated somewhat higher maladaptive coping in the ADHD group ($M = 21.80$, $SD = 5.76$, $n = 5$) compared with those without ADHD ($M = 19.42$, $SD = 8.07$, $n = 33$), although the effect size was still small.

Pearson correlations were calculated across the total available sample. Burnout was significantly and positively correlated with sleep problems, $r(40) = .59$, $p < .001$, indicating that poorer sleep quality was associated with higher burnout. Burnout was strongly associated with perceived stress, $r(40) = .75$, $p < .001$, and was also positively associated with maladaptive coping, $r(40) = .68$, $p < .001$.

Burnout was negatively associated with self-efficacy, $r(40) = -.32$, $p = .038$, indicating that greater self-belief was somewhat linked to somewhat lower burnout. Burnout showed a small, non-significant negative correlation with social support, $r(40) = -.20$, $p = .20$. Additional correlations indicated that sleep problems and perceived stress were moderately and positively correlated, $r(42) = .41$, $p = .005$.

To explore whether ADHD diagnosis or psychological factors predicted burnout, a multiple linear regression was conducted using participants with complete data ($n = 35$). Burnout (BAT-S total) was entered as the dependent variable. Predictors included ADHD diagnosis, sleep problems, perceived stress, self-efficacy, social support, and maladaptive coping.

The overall model was statistically significant, $F(6, 28) = 13.95$, $p < .001$, and explained a large proportion of variance in burnout, $R^2 = .75$, adjusted $R^2 = .70$. Perceived stress (standardized $\beta \approx .41$, $p \approx .005$) and maladaptive coping (standardised $\beta \approx .35$, $p \approx .010$) significantly predicted higher burnout. Sleep problems also contributed positively to burnout (standardised $\beta \approx .20$, $p \approx .020$), and social support showed a trend toward a protective effect (standardised $\beta \approx -.20$, $p \approx .057$). Self-efficacy did not make a unique significant contribution in the multivariate model. ADHD diagnosis did not significantly predict burnout beyond these psychosocial variables (standardized $\beta \approx .02$).

No significant differences were observed between ADHD and non-ADHD students in burnout, sleep difficulty, perceived stress, self-efficacy, social support, or maladaptive coping. In contrast, burnout showed strong associations with sleep quality, perceived stress, and maladaptive coping, and was modestly associated with lower self-efficacy. A multivariate model confirmed that stress, sleep and coping style were the strongest predictors of burnout. Whereas ADHD diagnosis did not explain additional variance.

Strengths of the Data

The strengths of the data included the fact that multiple questionnaires were used, which helped quantify burnout across a range of symptoms. The information associated with an ADHD diagnosis was collected, and the other questionnaires being used also helped measure external factors that may also be connected to either ADHD or burnout. Within the sample, a range of ages were used, ranging from 14-18 years of age. Furthermore, the sample was multicultural, including participants from Brazil, Japan, Australia, Indonesia, South Africa, Britain and Thailand. This ensured that any differences were likely not from cultural biases or differences.

Limitations of the Study

There are some limitations to the validity of the data that must be acknowledged. As previously mentioned, the small sample size makes it difficult to generalise these findings to a wider population. The sample size of the participants with ADHD, comprising 5 participants is too small to make any definitive conclusions about how ADHD affects burnout. Factors, such as similar socioeconomic status (SES) (as participants attended the same school) affect this, as there is not enough variation in SES. This is especially in reference to Indonesia to accurately represent a population. In addition, the sample was gathered using convenience sampling: by using an email to send the survey out and taking data from those who responded. Therefore, introducing less reliability as compared to using stratified samples that would be more representative of the cohort's population.

Cultural and individual differences are one of the most important factors that affect the reliability of the results. For example, out of the 46 participants, 21 were Indonesian. Thus, a potential limitation could be that the questionnaires were not sensitive to cultural differences. Individual differences have not been measured. A major limitation in ADHD research is that ADHD exists on a spectrum. This means that the participants who are diagnosed with the condition will experience different symptoms to varying extents. This may affect their likelihood of developing burnout differently. Furthermore, medication will affect those with ADHD differently. As participants were not asked if they were medicated, this could introduce another uncontrolled variable. From the participants with ADHD, none had the hyperactive presentation. The absence of this presentation in the study introduces potential incomplete information. Students with the hyperactive presentation may experience different prevalence in symptoms compared to the other two types.

Methodologically, collecting data only measures symptoms at one point in time, making it a cross-sectional study. To further examine any potential patterns between ADHD and burnout, it would be ideal to follow these participants over time. This would enable the researcher to administer questionnaires over regularly spaced intervals to monitor changes in symptom(s) prevalence over time. Furthermore, the time at which the survey was administered throughout the school year is relevant. This is because participants did not answer during

typical exam season. It is likely that administering the same survey during examinations would cause an increase in perceived stress levels, and consequently, students would experience symptoms of feeling burnout.

Future Research

In future studies, some modifications should be made to the method to ensure increased reliability. A longitudinal study should be implemented, ensuring that participants take the survey regularly to monitor changes in symptoms over time. The times when the survey is administered should be considered. It could be ideally a few months leading up to, or during examination seasons. Each question can be made compulsory to ensure richness in the data. Additionally, more reliable sampling methods should be implemented, such as stratified sampling, and more students can be involved to ensure more representative data. This includes participants who are diagnosed with all 3 types of ADHD.

Conclusion

The results of the data collected indicate that the hypothesis has been refuted. There is no evidence that suggests that students with ADHD are more likely to experience increased symptoms of burnout. Within this cohort of students, it is suggested that academic burnout seems to be more strongly linked to sleep quality, stress and coping styles rather than an ADHD diagnosis alone. ADHD may still increase vulnerability for some students. However, the following results point more strongly towards modifications in sleep, stress and coping as key targets.

Practically, this indicates that interventions that focus on sleep habits, stress reduction, healthier coping strategies and supporting students' sense of competence may benefit students both with and without ADHD. ADHD is still important to recognise, being a potential factor in vulnerability. In saying that, it may be only one part of a broader set of factors that can influence burnout in academic settings. However, ADHD is not a general condition and it affects people in various ways. Thus, one specific treatment cannot be used to treat all people with ADHD to the same degree of effectiveness. To seek more effective treatments, individual differences should be considered in order to identify individual issues to find more personalised interventions. This may come in the form of developing more efficient study routines that allow effective study sessions, providing time to wind down before sleeping, and meditation exercises to reduce stress.

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