UNDERSTANDING UNITED STATES COLLEGIATE FLIGHT STUDENTS' PERCEPTIONS AND REALITIES OF ANXIETY AND DEPRESSION

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Abstract: The Federal Aviation Administration (FAA) requires that all pilots hold a medical certificate granted by an Aviation Medical Examiner (AME), or an equivalent exemption standard. Over the years, these aeromedical examinations have grown to include aspects related to mental health, as well as a number of other factors. There are several mental health related conditions which are of concern to the FAA, including symptoms of anxiety and depression. These and other conditions can be grounds for medical disqualification, or additional testing or requirements. As a result, pilots are often wary of reporting their mental health issues. In recent years, aspects related to mental health and flying have become a topic of conversation at collegiate aviation programs across the country. This study highlights collegiate flight students' perceptions and realities associated with anxiety and depression. Results of the survey are examined in the context of four research questions, which guided the researcher's conclusions surrounding mental health within collegiate flight programs. These conclusions centered around the perceived benefit of not disclosing or ignoring mental health related conditions, whether admitting mental health related struggles has a negative impact upon flying careers, what strategies are effective to manage one's mental health, and whether flight students feel the current aeromedical process should be reviewed for possible revision.

Keywords: FAA, collegiate aviation, mental health, anxiety, depression

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CHAPTER I

INTRODUCTION

Piloting an aircraft requires a high level of physical fitness (Federal Aviation, n.d.-a). In the pioneering days of aviation, there was little regulation governing aircraft and the pilots who operated these aerial vehicles. As manned flight became more commonplace, so did governmental oversight of aircraft and aircrew. In the United States, the first regulations related to the physical aptitude of pilots followed only six months after the country's first government sponsored aviation safety standards were enacted in 1926 (Federal Aviation Administration, n.d.-b). In the nearly one hundred years since, these examinations have evolved to encompass a more holistic assurance of pilots' well-being, including aspects related to their mental health (Aircraft Owners and Pilots Association, 2022). The portion of the aeromedical examination process focusing on mental health is of great importance to aviators and the communities that they are a part of, due to the interconnectedness of a pilot's mental condition and safe flying (Northrup, 2021a).

The Federal Aviation Association (FAA) has formally enumerated a particular methodology for examining and diagnosing mental health conditions within the required medical exam process. The Administration's structured guide must be followed by trained and approved Aviation Medical Examiners (AMEs) who review both new and

existing pilot medical certification applications (Federal Aviation Administration, 2022a). Varying levels of medical certification allow these personnel to act in the capacity identified by their FAA issued airmen privileges (Code of Federal Regulations, 2023).

Background of the Problem

As outlined in 14 CFR Part 67-Medical Standards and Certification, the FAA aeromedical certification process for first-class medicals requires that appointed and appropriately qualified healthcare practitioners performing the exam focus their efforts on the following aspects (1) eye, (2) ear, nose, throat, and equilibrium, (3) mental, (4) neurologic, (5) cardiovascular, and (6) general medical condition (Code of Federal Regulations, 2023).

Each subsection has specifically identified standards that must be met for an applicant's continued consideration towards receiving a valid medical certificate. The primary goal of these medical examinations is to protect the pilot, others in the aircraft, and those on the ground (Federal Aviation Administration, 2013).

Considering its importance to overall well-being and performance, mental health is a crucial aspect that is focused on during the medical application process. In terms of the number of covered items and descriptions thereof, the mental health portion of the exam is comprehensive and focuses on several criteria. For an applicant's successful passing of this section, they must not have not been diagnosed or have an established history of four identified disqualifying diagnoses (Code of Federal Regulations, 2023). These diagnoses, in general, are (1) a personality disorder, (2) a psychosis, (3) a bipolar disorder, and (4) substance dependence (Code of Federal Regulations, 2023).

The current or historical presence of these and other mental diagnoses is of elevated concern to the FAA. In addition to the noted, symptoms of anxiety and depression, as well as

formal diagnoses, are also grounds for medical application denial (Federal Aviation Administration, 2022a). Collectively, these two mood disorders affect nearly 26.2 million adults in the United States (Anxiety and Depression Association of America, n.d.-a). The occurrence rate of anxiety and depression in the aviation community is similar to that of the general public, at around 6% of the population (Transport Canada, 2019). Additionally, the level of reported mental illness in the eighteen- to twenty-five-year-old age range (i.e., the age typically associated with college students) was the highest of any population group, at 30.6% in 2020 (Substance Abuse and Mental Health Services Administration, 2021).

The repercussions of medical certification denial can be both career and life defining (Blue, 2016). Resultantly, many aviators are careful to balance their personal well-being with careful consideration of their futures (Blue, 2021). Arguably, there is not a more professionally defining time in one's life than college. For flight students enrolled in university professional flight (or similar) programs, the pursuit of flight ratings, and ultimately a flying job post-graduation, is inexplicably tied to their ability to be granted and continually hold an FAA first-class medical certificate. In some cases, but less frequently, a second-class medical certificate is the highest level of FAA-issued medical certificate that a pilot carrying passengers for hire is required to hold (Federal Aviation Administration, 2016).

Statement of the Problem

The FAA's aeromedical examination process' criteria related to mental health, identified in 14 CFR Part 67-Medical Standards and Certification, has not been amended since 1996 (GovInfo, 1996). Regulations related to the use of SSRIs for anxiety and depression were last revised in 2010 (U.S. Department of Transportation, 2010). Most recently, in 2016, third-class medical restrictions were relaxed for pilots requesting initial and

subsequent certificate issuances, with the introduction of BasicMed (Federal Aviation Administration, 2017a). Additionally, there are pathways that exist that applicants can follow to be further considered by the FAA for medication certification if they have certain disqualifying or other conditions. These pathways exist for those with certain mental health disorders, such as anxiety and depression (Aircraft Owners and Pilots Association, n.d.-a).

Irrespective of the latest revisions to the aeromedical process, or additions of new certification pathways, there has been increased attention on mental health in the flying population throughout recent years. Callouts prompting additional industry focus on mental health have originated in well-respected industry publications, online forums, aviation non-profit advocacy foundations, and other sources. Many of these voices collectively advocate for Aeromedical Reform, the dynamic concept of aeromedical standards' revision in the United States (Laczko, 2023). These requests center around policy change of varying forms, but almost all of which request an in-depth review of the current aeromedical certification process and identification of aspects that could be improved (Goyer, 2021).

Some of the increased industry attention has been brought forth by concerned parties who have explained their own or others' struggles with mental health and flying. These personal tales contribute to the narrative surrounding the increased interest in this topic. One of the most compelling viewpoints about mental health and flying was posthumously offered. Since October of 2021, some of the expanded attention towards pilots' mental health has been the result of a high-profile incident involving a freshman collegiate flight student, John Hauser. The nineteen-year-old University of North Dakota private pilot's intentional airplane crash has since highlighted the juxtaposition of mental health within collegiate flight programs across the country (Wildes, 2022).

While the hopeful airline pilot could not overcome his struggles with mental health and the perceived repercussions of seeking help, he left his loved ones with one request. Hauser wrote in a letter to his parents "If you can do anything for me, try to change the FAA rules so that other young pilots don't have to go through what I went through" (ABC 7 Chicago, 2022).

As a result of this incident and other circumstances, some common questions and potential problems related to mental health and aviation have surfaced within collegiate aviation programs. A sampling of the potential issues and related questions that affect flight students in these programs include (1) whether flight students forgo professional help for their mental health concerns, (2) how flight students manage mental health concerns, (3) flight students' perceptions about the FAA's stance on mental health disorders, (4) flight students prioritizing their careers over their mental health, and (5) flight students developing an unhealthy reliance upon flying as their sole identity. These statements will help to guide the research in better understanding students' attitudes towards mental health.

For many of these students, the transitional aspect of college is one of the most defining periods of their lives (Montgomery & Cote, 2008). During their undergraduate tenure, students work to better themselves academically while preparing for life post-graduation (Montgomery & Cote, 2008).

Purpose and Significance of the Study

The purpose of this study is to document United States collegiate flight program students' sentiments towards mental health and its impact on required flight training undertaken during their undergraduate tenure, as well as their flying careers thereafter. This in-depth examination will provide a better understanding of these aviators' attitudes towards

mental health in aviation, how they manage their mental health, how these practices may transition into their flying careers, and whether the current FAA aeromedical standards are properly written to protect these and other aviators, as well as the public. The study's purpose is also to guide recommendations related to potential future improvements to the aeromedical examination and certification process' mental health criteria and educate collegiate flight programs about this omnipresent topic.

The significance of the study is related to the impact of potential mental health issues among pilots within the respondent population of collegiate flight programs. Because this topic has not been thoroughly researched, specifically regarding collegiate flight students' perceptions and realities surrounding mental health, more clarity is needed on the subject. A focused examination of the subject will help to reveal opportunities for the FAA to better support pilots in training through flexible mental health reform that is aligned with present-day mental health standards. As a result of this research, collegiate flight programs will also be able to better support their students, including those who may suffer from mental health disorders and those going through challenging periods of their collegiate tenure.

Research Questions

The following four questions were crafted with the purpose of helping to create a better understanding of collegiate flight students' perceptions regarding mental health:

RQ1: Does the current aeromedical process encourage collegiate flight students to either not disclose, ignore, or self-treat conditions related to mental health and fitness?

RQ2: Do collegiate flight students view disclosing mental health struggles as having a negative impact upon their careers?

RQ3: What strategies do collegiate flight students use to manage their mental health and what are these strategies' effectiveness?

RQ4: Do collegiate flight students feel there is tangible benefit to pilots and the public if the current first-class medical certification standards related to mental health aspects are revised?

Assumptions and Limitations of the Study

The following limitations and assumptions will be followed throughout the study to ensure an impartial, factually sound, and exhaustive examination of the chosen topic. Identified assumptions and limitations of this study are:

1. Participation in the study will be limited to currently enrolled collegiate flight students who are requested to complete the required research survey.
2. Participating students will either have received an FAA medical certificate (of any class), are in the process of applying for one, or are familiar with the certifications' requirements.
3. Participating students will truthfully answer all questions to the best of their knowledge.
4. Too few current factual resources related to mental health, flying, and the FAA's aeromedical certification process.

Definition of Terms

The following terms have been defined, so that a common baseline understanding is present in this study.

Active Airman Certificate**:** An active airman is someone with a valid airman certification (of any type), in addition to a current FAA medical certificate (Federal Aviation Administration, 2022b).

Aeronautical Decision Making (ADM): Aeronautical Decision Making (ADM) is a formal process of decision making that focuses on reducing pilot error. The process identifies steps of good decision making, including systematic review of the process to ensure continued safe operations (U.S. Department of Transportation, 1991).

Anxiety: Those with persistent anxiety can experience varying symptoms, including exasperated and persistent feelings of fear and worry. This mood disorder is classified by several types, all of which can have a significantly negative impact upon those who suffer from (Mayo Clinic Staff, 2018a).

BasicMed: Introduced in 2016, BasicMed is an alternative avenue available for pilots to apply for and receive an FAA third-class medical. The process provides flexibility, in terms of allowing pilots to conduct their physical examiner through a doctor that is not an Aviation Medical Examiner (AME) (Federal Aviation Administration, 2022c).

Code of Federal Regulations (CFR): The Code of Federal Regulations (CFR) is the collection of rules issued by the Federal Government's various departments and agencies, which are published within the Federal Register (GovInfo, n.d.).

Depression: Depression is characterized by several symptoms, the most impactful being disinterest and a persistent feeling of sadness. The mood disorder can also be called major depressive disorder or clinical depression and can have an impact upon daily life for those affected (Mayo Clinic Staff, 2018b).

European Union Aviation Safety Agency (EASA): The European Union Aviation Safety Agency (EASA) is the civil aviation authority for the European Union. The organization was established in 2002, consists of 31 member states, and is focused on safety protection for European Union citizens (European Union Aviation Safety Organization, n.d.).

FAA's Compliance Program: The FAA's Compliance Program exists to identify and remedy safety issues caused by rule deviations. The Program is based upon a culture of honest and transparent communication between the FAA and those governed and is different from that of a purely enforcement-based structure (Federal Aviation Administration, 2021).

Federal Aviation Administration (FAA): The Federal Aviation Administration (FAA) is the civil aviation authority for the United States. The organization was established in 1958 and exists to "provide the safest, most efficient aerospace system in the world." The FAA is responsible for overseeing a wide variety of aspects related to civil aviation, including aircraft manufacturing, maintenance, airman certification, training standards, medical certification, and other aspects (Federal Aviation Administration, n.d.-c).

Federal Aviation Regulations (FAR): The Federal Aviation Regulations (FAR) are a portion of the Code of Federal Regulations (CFR). The Federal Aviation Regulations (FAR) are outlined within Title 14 of the Code of Federal Regulations: Aeronautics and Space (Code of Federal Regulations, 2023).

Federal Flight Surgeon: The Federal Flight Surgeon is the highest medical authority at the FAA. They oversee the strategic management for all medical programs within the Administration (Federal Aviation Administration, n.d.-d).

Mood Disorder: A mood disorder is a state in which someone's mental state is inconsistent with their general mood. Mood disorders take varying forms and can include, major

depressive disorder, bipolar disorder, seasonal affective disorder (SAD), as well as other forms of anxiety and depression (Mayo Clinic Staff, 2021).

Selective Serotonin Reuptake Inhibitor (SSRI): Selective Serotonin Reuptake Inhibitors (SSRIs) are commonly prescribed antidepressants, which work by increasing the amount of serotonin in the brain (Mayo Clinic Staff, 2019).

Stress: Stress is the byproduct of daily life and its demands. Certain factors can exacerbate the stress that one is under, which can have a detrimental physiological effect if not properly controlled or becomes too pervasive (Mayo Clinic Staff, 2022).

CHAPTER II

LITERATURE REVIEW

A review of literature is included in this document, so that a comprehensive understanding of the researched topic and related aspects exists. The seven elements covered within this section include (1) Collegiate Flight Program Requirements, (2) Fitness for Flight, (3) Mental Health and Aeronautical Decision Making, (4) Mental Health and Pilots, (5) Medical Certification Waiver Pathways, (6) Mental Health Incidents and Resources, (7) Continuous Improvement at the FAA.

Collegiate Flight Program Requirements

Collegiate flight programs within the United States offer a variety of degrees and related coursework. Most commonly, the bachelor's degree option is labeled as a "Professional Pilot," "Commercial Aviation," degree, or have a similar title. Many students from these programs ultimately seek post-graduation employment in commercial, business, or another type of aviation. Based upon the institution, their accreditation requirements, and other factors, each collegiate flight program's overall structure will vary. Oftentimes, these programs are governed by FAA CFR Part 141, which identifies the need for a defined syllabus and overall training regime (Federal Aviation Administration, n.d.-e). Regardless of the degree title and other factors, each option provides a mix of in-classroom and in-aircraft

coursework to ensure overall competence and meet federally defined flight standards (Casebolt, 2015).

Each program has their own set of policies and desired outcomes. For instance, The University of North Dakota's Commercial Aviation program lists the following information as a guiding outline for both students and administrators (University of North Dakota, 2021).

- Be able to demonstrate knowledge of the skills, techniques, and procedures for safely operating turbine aircraft in commercial operations
- Be able to demonstrate knowledge of human physiology and crew performance in hostile and challenging environments, applying principles in operational, problem-solving scenarios
- Knowledge of the skills, techniques and procedures for managing airports, airlines, government, non-governmental and general aviation organizations
- Be able to demonstrate knowledge in single-engine, multi-engine, VFR, and IFR flight to the commercial pilot standard
- Be able to demonstrate instructional knowledge in single-engine VFR and IFR flight

Within the University Aviation Association's member directory, there are dozens of represented four-year programs, although that number does not capture every program meeting that description within the United States (University Aviation Association, 2022).

Table 1 showcases an overview of University Aviation Association member schools' "Professional Pilot" or "Commercial Aviation" (or similar) bachelor's degree

attributes (University Aviation Association, 2022). These profiles' aggregated attributes will serve as a general overview of like-typed programs and the associated work that students must complete to successfully graduate.

Table 1

Selection of Collegiate Flight Program Requirements (University Aviation Association, 2022)

	Kansas State University Polytechnic	**The University of North Dakota**	**Oklahoma State University**
Program Name	Professional Pilot	Commercial Aviation	Professional Pilot
Instruction Provided Under	Part 141	Part 141	Part 141
Program Certificate Offerings	PPL, Commercial, Instrument, Multi-Engine, CFI, CFII, MEI, ATP	PPL, Commercial, Instrument, Multi-Engine, CFI, CFII, MEI, R-ATP, ATP, Rotorcraft	PPL, Commercial, Instrument, Multi-Engine, CFI, CFII, R-ATP
Minimum/Average Flight Hours at Graduation	225/250	197/222	215/230
Number of Enrolled Students	261	1,486	425

Medical certification requirements for these and other programs students vary, based upon the ratings being pursued and other factors. For instance, the FAA requirement to exercise the responsibilities of a Commercial Certificate is to concurrently hold a second-class medical (Federal Aviation Administration, 2015). The requirement to exercise one's Airline Transport Pilot distinction is to concurrently hold a first-class medical (Federal Aviation Administration, 2015).

For the flight related aspects of the programs, the students must meet FAA requirements in order to obtain flight ratings required to successfully pass the related course, and ultimately the program. Generally, these ratings are completed in the same semester at one school, as they are at another. This information is based upon the programs' recommended course guidelines for students that will take the typical amount of time to graduate.

Additionally, some programs offer the potential for students to receive additional ratings, such as a high-performance endorsement, a tailwheel endorsement, and others, either through required or elective coursework (University Aviation Association, 2022). The cadence for students receiving any ratings and completing the associated coursework is dictated by program aircraft schedule, instructor availability, student learning success, and other factors.

Fitness for Flight

Formal medical evaluations have long been the precursor to anyone assuming the role as a pilot (Federal Aviation Administration, n.d.-d). The FAA, in addition to aviation interest groups, has identified avenues outside of the formal process that positively impact preflight physical and mental determinations of airmen. Pilots themselves play a

crucial role in determining whether they are physically and mentally capable of flying at a certain point in time (Aircraft Owners and Pilots Association, n.d.-b).

A pilot's need to evaluate themselves for medical fitness is continual (Sancetta, 2019). This need is codified within FAR 61.53, which prohibits aircraft operations during medical deficiency (Code of Federal Regulations, n.d.). The regulation leaves room for interpretation, as it does not call out any specific medical condition(s) or related aspects as being of particular concern (Code of Federal Regulations, n.d.). Additionally, FAR 61.53 leaves the authority for determining medical fitness ultimately up to the pilot-in-command (Sancetta, 2019).

While the noted FAR is intended to be an all-encompassing guide, and resultantly is a source of repercussion for pilots that knowingly operate aircraft while medically deficient, there are tools that pilots can use to help determine their medical fitness (Bell, 2018). These tools are typically based upon checklists, or another formal, written memory method. The practice of utilizing checklists in aviation helps to ensure task completion, lessen complexity of operations, and positively impact safety as a result (Ludders & McMillan, 2017).

To help mitigate against the lack of understanding on the topic and the effects of various medical conditions, the FAA created the human factors-based concept of *Fitness for Flight* (Federal Aviation Administration, n.d.-d). This concept outlines aspects within FAR 61.53, but it also introduces the concept of personal checklists for pilots (Federal Aviation Administration, n.d.-f). This introduction helps to translate the success of checklists in the cockpit to another aspect of aviation and flying. According to the FAA, "Aircraft accident statistics show that pilots should be conducting preflight checklists on

themselves as well as their aircraft for pilot impairment contributes to many more accidents than failures of aircraft systems" (Federal Aviation Administration, n.d.-f).

In an effort to combat pilot impairment, the FAA created the "IMSAFE" checklist, which focuses on six elements related to *Fitness for Flight* (Federal Aviation Administration, n.d.-f). This checklist's usage helps a pilot to ensure that they are "…physically and mentally safe to fly; not being impaired by: Illness, Medication, Stress, Alcohol, Fatigue, Emotion" (Federal Aviation Administration, n.d.-f).

Mental Health and Aeronautical Decision Making

Decision-making skills are an integral part of a pilots' safety focus in the cockpit (Flight Standards Service, 2016). These abilities are crucial in managing risk, as well as rectifying hazardous situations as they arise (Flight Standards Service, 2016). Effective decision-making skills are the basis for formal Aeronautical Decision Making (ADM) processes, which are utilized with the intent of positively impacting pilot and passenger safety (Flight Standards Service, 2016).

One's ability to make sound decisions can be negatively impacted by mental health disorders, though (Adams, 2015). While every human is biologically conditioned to maximize reward and minimize loss, those with mental health disorders can have altered decision-making processes (Adams, 2015). Ultimately, this can lead to an imbalance between a standard perception of risk and reward (Adams, 2015). No risk will ever wholly be eliminated in aviation but managing it against the potential payouts of reward is a crucial aspect of safety orientation and the practice of ADM (Federal Aviation Administration, 2008).

In addition to previously diagnosed mental health disorders, emotionally upsetting events and other temporary factors can have a significant impact on decision making in pilots (Federal Aviation Administration, n.d.-f). According to the FAA, "The emotions of anger, depression, and anxiety from such events not only decrease alertness but also may lead to taking risks that border on self-destruction" (Federal Aviation Administration, n.d.-f). This recklessness, aggravated by any number of mental health factors, is largely caused by pilots' attitudes (Flight Standards Service, 2016). The five FAA-identified hazardous attitudes that contribute to poor pilot judgement are, anti-authority, impulsivity, invulnerability, macho, and resignation (Flight Standards Service, 2016).

Stress also has an impact upon one's ability to effectively make decisions (Wemm & Wulfert, 2018). The relationship between stress and judgement is closely intertwined, with its effects in a controlled experiment causing participants to make "less advantageous" decisions, as compared to those in a control group (Wemm & Wulfert, 2018).

These decisions affect not only those making them [pilots], but also those aboard the aircraft and anyone within the aircraft's flight path. Pilots are continually making decisions that affect the ultimate safety of themselves and others (Federal Aviation Administration, 2008). Each new decision made has the potential to negate or contribute to an ultimate accident chain which could cause injury to people and property (U.S. Department of Transportation, 1991).

Mental Health and Pilots

In 2021, there were 720,605 active airmen certificates in the United States (Federal Aviation Administration, 2022b). These airmen all hold current medicals of

some class, which includes active pilots that are governed by BasicMed (Federal Aviation Administration, 2022b). Of the total figure, 161,459 of the airmen's highest fixed-wing airmen rating is Private, with 104,610 being Commercial and 163,934 being Airline Transport (Federal Aviation Administration, 2022b).

Of the total active population, airmen who experience symptoms of anxiety and depression is underreported, according to a conducted workplace psychological evaluation testing campaign (Werfelman, 2015). There is a significant percentage (56.1%) of pilots that have noted a previous history of avoiding healthcare interaction, for fear of aeromedical certificate loss (Hoffman et al., 2022). Similarly, 78.63% of pilots felt worried about seeking medical care (Hoffman et al., 2019). Additionally, 26.8% of pilots withheld or misrepresented healthcare facts when asked (Hoffman et al., 2022).

The FAA acknowledges that there is, "…a fraction of the aviator population who most likely are flying with the condition and medications without our [FAA] knowledge" (Durham, 2018). Conditions not disclosed to an AME accounted for 5% of finalized fatal accident investigations in the United States (Vuorio et al., 2018).

Several factors, wholly unique or more prevalent to pilots, potentially could affect the true number of pilots suffering from anxiety or depression, which may be a function of the profession itself (Murphy, 2021). Some of these factors can be explained by Karasek's Job Strain Model (Ang, 2019). The matrix model weighs the intertwined impacts of job demands and job decision latitudes (Ang, 2019). The model asserts that professional flying jobs, due to their high demands and low decision latitudes can be classified as high strain jobs (Ang, 2019). High strain jobs exhibit risk for psychological

and physical stress, and ultimately are linked to increased instances of depression and anxiety (Warner, 2003).

Medical Certification Waiver Pathways

In 2018, the FAA processed 401,169 medical certification applications (Federal Aviation Administration, 2022b). At year end in 2018, there were an estimated 633,317 active airmen, which was 13.78% fewer than the end of the year in 2021 (Federal Aviation Administration, 2022b). According to the administration, a vast majority of the medical applications processed each year are successful (McCloud, 2009). Roughly 95% of applicants receive their medical certificate at the time of their AME physical exam (Northrup, 2021b). Ultimately, a majority of those who were not initially granted with a medical certificate receive it after the FAA conducts further review (McCloud, 2009).

The FAA references certification avenues for both those who are mandatorily disqualified and others who are initially unable to receive medical certification for a variety of reasons (Pinnell, n.d.). There are fifteen conditions expressly noted as disqualifying. These conditions are (1) angina pectoris, (2) bipolar disease, (3) cardiac valve replacement, (4) coronary heart disease that has been treated or, if untreated, that has been symptomatic or clinically significant, (5) diabetes mellitus requiring hypoglycemic medications, (6) disturbance of consciousness without satisfactory explanation of cause, (7) epilepsy, (8) heart replacement, (9) myocardial infarction, (10) permanent cardiac pacemaker, (11) personality disorder that is severe enough to have repeatedly manifested itself by overt acts, (12) psychosis, (13) substance abuse, (14) substance dependence, and (15) transient loss of control of nervous system function(s) without satisfactory explanation of cause (Federal Aviation Administration, 2013).

The process by which a waivered medical certificate is issued is different from that of a formal appeal through the FAA (Federal Aviation Administration, 2013). The appeal process requests the results of an AME conducted exam that resulted in a denial of medical certification for the applicant (Federal Aviation Administration, 2013). For medical certificate applicants who do not meet the regular medical standards, there are pathways which they can follow to obtain a medical certificate (Williams, 2022). There are several types of medical certification waivers.

One pathway to waivered certification is through the Conditions AMEs Can Issue (CACI) process. This program identifies twenty conditions which are not disqualifying for AMEs to issue medical certificates against at the time of the exam (Federal Aviation Administration, 2022a). Prior to the CACI process' introduction, all these conditions would have previously required the application's deferral to the FAA for further review (Williams, 2022). Presently, the CACI process' outlined conditions do not include any related to mental health disorders (Federal Aviation Administration, 2022a).

Unlike receiving a CACI, applicants who obtain medical certification through a Special Issuance (SI) or a Statement of Demonstrated Ability (SODA) are usually subject to "limited durations or additional requirements" (Williams, 2022). According to the FAA, the scope for a Statement of Demonstrated Ability is more limited than that of a Special Issuance (Williams, 2022). In that vein, a SODA may require observed flying with the applicant to determine whether any imposed limitations on the certificate would be appropriate (Williams, 2022). Some examples of conditions which applicants have received a SODA for are static or nonprogressive in nature, which do not inhibit safe operation of flight in nature (Federal Aviation Administration, 2022a).

On the other hand, an Authorization for Special Issuance (SI) of a Medical Certificate (Authorization) is a process whereby applicants with disqualifying conditions receive a medical certificate through an FAA review and approval process (Federal Aviation Administration, 2022a). The review is conducted by the FAA's Federal Flight Surgeon and their criteria for granting a Special Issuance is that the applicant can exercise the requested medical class type's responsibilities without endangering public safety (Federal Aviation Administration, 2022a). A medical certificate issued through this process is subject to varying limitations and its issuance may be predicated on additional tests and evaluations, at the discretion of the Federal Air Surgeon (Federal Aviation Administration, 2022a). Medical certificates granted through the Special Issuance process are subject to an expiration date and airmen may reapply after its expiration to continue exercising the granted authority (Federal Aviation Administration, 2022a). To help support those requested that their Authorization be re-issued, the FAA has outlined a formal process by which AMEs can assist airmen directly and is called the AME Assisted Special Issuance (AASI) (Federal Aviation Administration, 2022a).

As Special Issuance pertains to mental health, a personality disorder that is severe enough to have repeatedly manifested itself by overt acts and psychosis are two of the fifteen noted medical conditions that are disqualifying (Federal Aviation Administration, 2013). Regardless of whether an applicant has these conditions or others, they have the potential for receiving FAA medical certification, as long as the condition in question is adequately controlled (Federal Aviation Administration, 2013). Additionally, the Special Issuance Process serves as a pathway for applicants with anxiety or depression, depending on the severity and other circumstances (FlightPhysical, n.d.). Additionally,

there is a pathway that can be used for those controlling anxiety and depression symptoms using an SSRI (Federal Aviation Administration, 2022a).

Mental Health Incidents and Resources

Out of all available statistics, pilot error (i.e., human factors related aspects) is the biggest cause or contributing factor to aircraft crashes across all types of aircraft, pilots, etc. (Flight Standards Service, 2016). Additionally, there have been some well-known aviation accidents which have specifically referenced mental health issues as reasons for the accident (Werfelman, 2015).

One recent aviation accident that can be attributed to a mental health disorder occurred in October 2021 (Wildes, 2022). John Hauser, a University of North Dakota Commercial Aviation student, intentionally flew the aircraft he was flying into the ground (Wildes, 2022). In a personal communication revealed after the crash, Hauser referenced the fear of losing his flying privileges and the belief that a life without flying was not a life worth living (Wildes, 2022). This incident not only brought attention to pilots' mental health in general, but it also brought forth discussions related to mental health at similar collegiate flight programs across the country.

Students who are in collegiate flight programs are in an interesting position, compared to those in other academic programs. Flight students must not only work to manage their own stress and potential mental health disorders, but they must also be cognizant of any potential impacts upon their medical certificates and flying privileges. There are a many methods and practices to positively impact mental health.

A commonly practiced method of mitigating the effects of anxiety and depression is through utilization of certain medication, such as SSRIs (Mayo Clinic Staff, 2019). At

present, the FAA currently offers a pathway for pilots to utilize SSRIs for the management of anxiety and depression symptoms (Federal Aviation Administration, 2017b). But utilization of these drugs is typically not a temporary option for airmen, since most doctors prescribe SSRIs with the intent of long-term usage, based upon their increased effectiveness over longer intervals of time (Mayo Clinic Staff, 2019). As currently outlined by the FAA's process, these four specifically enumerated SSRI types (Fluoxetine, Sertraline, Citalopram, and Escitalopram) must be continually used, and their effects observed by an approved healthcare provider to determine their efficacy and the airmen's mental stability prior to their ability to fly again (Durham, 2018).

Therapy is also another effective avenue that can used to minimize the effects of anxiety and depression (Anxiety and Depression Association of America, n.d.-b). Therapy's benefits over time can be just as effective as regular utilization of medication (Murphy, 2021). According to the FAA's 8500-8 form, which aviation medical applicants complete prior to undergoing an aeromedical examination, all visits within the last three years to a substance abuse specialist, clinical social worker, psychologist, nurse practitioner, physician assistant, or physician for treatment, examination or medical/mental evaluation must be reported (Federal Aviation Administration, 1999). Conversely, the same form notes that pilots can undergo counseling and not report the visit(s) to the FAA, as long as it is not for a psychiatric condition or substance abuse (Federal Aviation Administration, 1999). Some pilots fear that therapy is a slippery slope to medical certification denial (Bayern, 2021). This fear is commonly referenced as a barrier to pilots seeking help (Murphy, 2021).

To better support their employee pilots, without the worry of formal therapy's potential ramifications to its airmen, several airlines and other pilot-heavy organizations have created peer support and related programs. The prevalence and robustness of these resources is dependent upon a variety of things, including organization size, location, and other factors. Following the *Germanwings* accident in 2015, whose cause was fully attributed to the co-pilot intentionally crashing the airliner, there was an EASA-led task force focusing on mental health in flight crew (European Pilot Peer Support Initiative, n.d.). From this group's efforts, they have outlined elements of a successful peer support program, which among other attributes, is consultative, confidential, trust-based, and non-punitive in nature (European Pilot Peer Support Initiative, n.d.). The overarching goal of such programs is to be a resource for flight crew, with the goal of providing them the help that they need to ensure the continued ability to operate as a member of the flight crew (European Pilot Peer Support Initiative, n.d.).

Collegiate programs have also begun dedicating efforts towards peer support groups, as well as seminars and workshops focused on mental health within their flying populace. As an example, Embry-Riddle Aeronautical University, in Prescott, Arizona, offers a course entitled Aviation Stress Management (Pinholster, 2022). The course was created as a means for providing students with the tools to better cope with stresses, with additional observed byproducts having been increased student success (Pinholster, 2022). The school's Daytona Beach, Florida campus has introduced an Aviation Mental Health Task Force to better understand students' experiences, as well as provide evidence-based methods to better support them during their collegiate tenure (Pinholster, 2022). Embry-Riddle is not the only collegiate program that has recognized the importance of stress and

mental health discussions related to their students. In December of 2021 the University of North Dakota hosted a summit focused on mental health in aviation, which was attended by other collegiate organizations, as well as members from the aviation industry and the government (Murphy, 2021). The events' speakers covered a litany of subjects, including barriers for pilots seeking help, peer support networks' positive impacts upon safety, pilots engaging in unauthorized and unreported self-medication, as well as a variety of other studies and potential ideas to remedy perceived issues with the current state of mental health in aviation (Murphy, 2021). The university held another summit in November of 2022, with the goal of continuing the conversation around mental health in aviation (Supola, 2022).

Continuous Improvement at the FAA

The Federal Aviation Administration has, through industry calls and their own introspective conclusions, recognized the need for continuous improvement related to the aeromedical certification process. In line with that goal, some things have changed in recent years, in regard to the aeromedical certification process. The FAA highlights the following as evidence of improvements to date, including, creation of the AASI (AME Assisted Special Issuance) process, expansion of the CACI process, introduction of the FAA's compliance program, and the creation of BasicMed (Carty, 2022).

Frequency and scope of changes are routinely based upon efforts championed by the highest personnel in charge at the FAA (Northrup, 2021b). The acting Federal Air Surgeon, Dr. Susan Northrup, offers the self-imposed goal of increasing transparency related to the FAA's decision-making and accessibility to their offices (Northrup, 2021b). To accomplish their goal and the further efforts towards improving processes to

positively impact airmen, Dr. Northrup refers to the administration's continued commitment to the "pathway to yes" (Northrup, 2021b). The "pathway to yes," refers to the FAA's desire to work as efficiently and safely as possible in processing medical certification request for airmen who met the identified standards (Northrup, 2021b).

CHAPTER III

METHODOLOGY

Chapter III describes the purpose of the study, sampling procedures, instrumentation, and methods used to collect and analyze the data. This mixed methods research study used both qualitative and quantitative data to better understand collegiate flight students' perceptions and realities surrounding aspects related to anxiety and depression within United States collegiate flight programs.

This study answered the following four research questions.

RQ1: Does the current aeromedical process encourage collegiate flight students to either not disclose, ignore, or self-treat conditions related to mental health and fitness?

RQ2: Do collegiate flight students view disclosing mental health struggles as having a negative impact upon their careers?

RQ3: What strategies do collegiate flight students use to manage their mental health and what are these strategies' effectiveness?

RQ4: Do collegiate flight students feel there is tangible benefit to pilots and the public if the current first-class medical certification standards related to mental health aspects are revised?

The six areas that are examined within the Methodology section are the (1) Purpose of the Study, (2) Research Population Description and Selection, (3) Description of the Research Instrument, (4) Reliability and Validity, (5) Data Collection Procedure, and (6) Statistical Analysis of the Collected Data.

Purpose of the Study

The purpose of this exploratory study is for the researcher to better understand aspects related to anxiety and depression within United States collegiate flight programs, in addition to students' perceptions about these mood disorders. Through this research, a comprehensive summary of research findings will be presented, as well as subsequent conclusions and recommendations. All findings, conclusions, and recommendations are a direct result of the students' comments within the research instrument, in combination with existing third-party research examined in the literature review section of this document.

Research Population Description and Selection

In addition to creating a succinct survey, efforts were taken to ensure that the selected research population the survey was administered to was appropriate. The research population's characteristics were determined by the researcher, through a formal process of identifying participant criteria from a well-defined population. This method of identifying a sample is called probabilistic sampling and was used in the study to create a statistically representative sample of the collegiate flight student population (Sheppard, 2019, p. 111).

The researcher's objective was that only undergraduate flight students from UAA-affiliated programs which offer a bachelor's degree in Professional Pilot, Commercial

Aviation, or similar would participate in the survey. A requirement of these programs is that students either have or will have an FAA medical certificate, ensuring that participants are versed in the process' requirements and associated topics.

There was the target of approximately one hundred completed surveys collected. The researcher determined that this number of received surveys (with a maximum variance of minus 10%) would be appropriate to best understand the population of collegiate flight program students. The researcher hypothesized that efforts would be maximized at this sample size, as sampling error would be minimized and a strong reflection of the population would be achieved (Sheppard, 2019, p. 112).

Prior to providing feedback to the survey, each participant had to provide their voluntary consent. A consent form (Appendix A) was reviewed by each participant prior to beginning the survey. This form noted exclusion/inclusion requirements, as well as procedures, expected participation time, potential benefits and risks, in addition to other related elements.

A key concern of the survey was that all participants' answers were provided and stored confidentially, so that no individual's responses could be identified at time of analysis or publishing. All survey data, throughout the entirety of the survey process, was handled in a confidential manner to prevent the possibility of privacy loss. Examples of procedures and methods that ensured privacy of research participants were informed and voluntary participation, no existence of any direct or indirect link back to individuals, no communication between students and the researcher, and the utilization of an anonymous data collection system that did not retain personal data.

Description of the Research Instrument

The survey, *Mental Health and Collegiate Flight Programs: Understanding the Prevalence of Anxiety and Depression* (Appendix B), was created by the researcher and consists of three parts. Each question within the survey was coded into the software in a way that required the participant to provide a response, so that no partial surveys were received. This helped to ensure that a more complete understanding of each participants' feelings surrounding mental health issues (particularly anxiety and depression) was gathered. As a result, a more representative data set would exist, allowing the researcher to draw appropriately guided conclusions and recommendations.

The first part of the survey focused on the personal information of each participant, with the goal of extracting suitable information to build a demographic profile of the survey's respondents. There are six questions within this section, which ask about (1) gender, (2) academic classification, in terms of completed credit hours, (3) class of FAA medical certificate held, (4) type of flying ratings/certificates held, (5) total number of logged flight hours, and (6) career aspirations. This information is relevant to the research topic, as it helps to assign a collective identity to the survey's participants. With an appropriate number and types of participants, the sample will be representative of the studied population (Sheppard, 2019, p. 111).

The second section of the survey prompted respondents to provide their own written responses to five questions. These questions request that students give their thoughts on: (1) what techniques they practice to manage stress and anxiety, (2) information surrounding backup career aspirations in the event of a medical certificate denial, (3) whether they have been denied an FAA medical in the past, (4) whether they

hold a Special Issuance medical, and (5) if they have any suggestions about possible aeromedical certification process improvements. These questions help to bring individual voice to the group of participants and their feelings surrounding mental health. Additionally, the detail participants provide will help to identify context and themes, potentially highlighting elements or concepts not asked by the researcher.

The final section of the survey consisted of thirteen Likert Scale statements, which solicit participants' thoughts on a variety of topics. The students' responses to these statements will help to provide clarity to their open-ended responses. These statements ask that participants provide a response as to whether they Strongly Agree (SA), Agree (A), are Neutral (N), Disagree (D), or Strongly Disagree (SD). In summary, these thirteen questions seek to learn about (1) the participants' opinion of whether the FAA has their best interests in mind, pertaining to mental health, (2) whether it is dangerous for pilots to hide mental health disorders, (3) potential dishonesty in the current aeromedical certification process, (4) awareness of dishonesty from pilots during that process, (5) the future of their career after a possible medical certificate denial, (6) whether they would be able to fly if they were depressed or anxious, (7) if they have a backup, non-flying career plan, (8) if they have a good understanding of the aeromedical process, (9) if the current standards are written in a clear manner, (10) whether the current standards should be reviewed and revised, (11) if they manage their mental health well, (12) if their collegiate program has adequate mental health resources, and (13) whether they feel those in their program care for them.

Reliability and Validity

The administered survey's elements were carefully considered, so that the survey's length was appropriate and provided clarity towards the four ideated research questions. Each of the survey's twenty-four questions were written in such a way to minimize the potential for misunderstandings within the responding population.

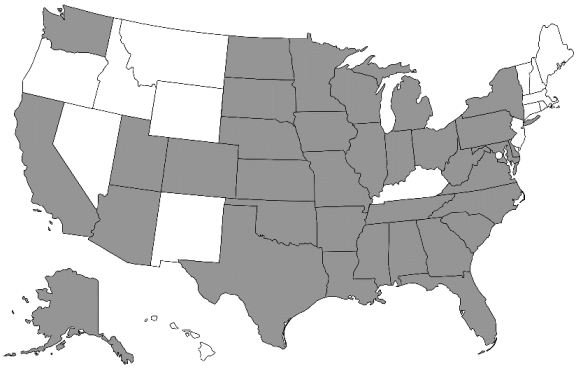
The survey was reviewed by four Oklahoma State University faculty members, as well as the Oklahoma State University Institutional Review Board (IRB), prior to being administered to collegiate flight students. This formal review process helped to ensure proper data collection methods and that the survey was conducted ethically, following all relevant guidelines. Additionally, the survey questions and consent form were provided to collegiate flight programs' identified contacts, for their review and approval, prior to the survey being offered to their program's students. In addition to this multi-step process, each question's collection of answers was reviewed by the researcher for possible errors or misinterpretations.

Data Collection Procedure

Based upon the UAA's 2022 Collegiate Aviation Guide, the researcher identified 66 collegiate flight programs (private and public universities) which offer four-year Professional Pilot, Commercial Aviation, or similar degree. These flight programs were in 34 states (Figure 1). Due to participants not identifying their school or other geographic identifiers, the distribution of the final participating institutions was unknown.

Figure 1

Geographic Location of Contacted Institutions



Note. Shaded states represent states of contacted institutions.

In addition to the researcher's noted identification efforts to further ensure the requested affiliation was active at time of participation, the initial email (Appendix C) that was sent to the programs' representatives expressly noted that only students from UAA-affiliated programs could participate in the study. Only those students who identified as having met the survey's identified requirements and provided their voluntary consent could complete the survey.

The survey was administered through a trusted, third-party data collection software, Qualtrics XM. The web-based software had several benefits for both participants and the researcher. On the participant side, users were able to view and accept the consent form, then immediately begin taking the survey on their mobile device or computer. Each response is recorded upon completion of the survey in its entirety by the participant. The software allowed the researcher to view the data in aggregate, as well as each participant's information on an individual basis. This capability was useful for the

researcher to understand links between data, as well as how individuals' responses varied from one another.

A designated representative(s) from each flight program was contacted with a link to the survey, with an attached consent form and survey overview. These two documents allowed representatives to understand the researcher's goals, as well as the importance of the research and how their program could participate.

The survey was initially sent in November of 2022 and a follow-up email was sent to the programs' representatives two weeks later. Forty-five days after the initial email, the researcher closed the survey and viewed the results.

Statistical Analysis of the Collected Data

The collected data was analyzed using a variety of common statistical methods to identity trends and other pertinent factors. Identification of these details allow the researcher to provide a detailed findings section, as well as evidence to support logical conclusions.

The six multiple choice questions, focusing on demographic related information, were examined using descriptive statistics. Descriptive statistics allow one to summarize data, which enables data sources that are clear and can be understood easily (Dunn & Clark, 2002, p. 1).

The five open-response questions were first reviewed by the researcher, so that a general understanding of the students' feelings was understood. This process helped the researcher to know which elements were commonly referenced by the participants in their responses. After reviewing each of the five responses, the researcher assigned a number to each of the commonly expressed elements. Then, for each question, every

response was individually coded with the corresponding number which most closely matched it. These coded responses were then grouped, allowing the researcher to showcase the frequency of similar responses.

The thirteen Likert scale statements, as well as the five open-ended questions, were also analyzed using descriptive statistics, in addition to statistical inference. There are several categories of measurement classified as descriptive statistics, including, measures of variability (or spread), frequency distribution, and measures of central tendency (Hayes, 2022). A frequency distribution is the best method for review of this data, as it focuses on expressing the number of times a data point was chosen. As a result, a frequency distribution allows one to easily see the most popular answers for all types of questions within the survey, through the use of percentages and other figures (Dunn & Clark, 2002, p. 4). These distributions were useful in guiding the researcher's determination of conclusions from the research survey, as well as recommendations.

Measures of central tendency is another descriptive statistics technique that was used to analyze, as well as communicate, the collected data. Measures of central tendency focus on the average or middle values of data sets and include the mean, median, and mode (Hayes, 2022). The use of statistical inference, also referred to as inferential statistics, was also relevant when creating conclusions that are supported by fact. Statistical inference is based on the mathematical theory of probability and involves drawing conclusions from the data (Dunn & Clark, 2002, p. 1).

All of participants' survey data was analyzed by the researcher using data analysis completed within the Qualtrics XM software, ensuring the strongest integrity in data translation and application to support the study's four research questions. The Qualtrics

XM software provided outputs to several statistical tests that are commonly used descriptive statistics measures. Results and interpretations from the statistical analysis of the collected data are explored in the following chapter.

CHAPTER IV

FINDINGS

This mixed-methods survey combined qualitative and quantitative data to explore the feelings and perceptions of participating students, from a contacted 66 four-year collegiate flight programs in 34 states.

The research questions that guided this survey were:

RQ1: Does the current aeromedical process encourage collegiate flight students to either not disclose, ignore, or self-treat conditions related to mental health and fitness?

RQ2: Do collegiate flight students view disclosing mental health struggles as having a negative impact upon their careers?

RQ3: What strategies do collegiate flight students use to manage their mental health and what are these strategies' effectiveness?

RQ4: Do collegiate flight students feel there is tangible benefit to pilots and the public if the current first-class medical certification standards related to mental health aspects are revised?

Chapter IV presents findings from the research survey's three sections. Section one, consisting of six questions, focused on the participants' demographic information,

including, their gender, current academic classification, class of held medical certificate, description of held airman ratings, total number of logged flight hours, and career aspirations. The second section allowed participants to provide open-ended responses to five questions. Participants were asked to provide detail regarding: (1) how they manage stress and anxiety, (2) whether they have a backup non-flying career goal, (3) whether they have ever been denied a medical certificate, (4) whether they currently hold a Special Issuance medical, and (5) any potential suggestions for aeromedical certification process improvement. Finally, the third section of the survey consisted of thirteen Likert scale statements, which covered a variety of topics. In this section, participating collegiate flight students were asked to ideate their perceptions and realities surrounding anxiety and depression. Response options for each statement included Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), or Strongly Disagree (SD).

Participant Response Rate

The researcher contacted 66 UAA-affiliated collegiate flight programs which offer a four-year Professional Pilot or similar bachelor's degree option. A follow-up reminder was sent to the programs' representatives two weeks after the survey was opened. After forty-five days, responses were collected from 95 collegiate flight students. These participants provided a response to each of the survey's twenty-four questions, meaning there were no gaps in the received data.

Collegiate Flight Students' Demographics

Question 1 of the research survey asked each participant to indicate their gender. Table 2 shows that 71 (75%) of the respondents indicated that they were males. The

remaining 24 (25%) students indicated that they were female. There were no chosen selections for either Prefer Not to Answer or Gender Not Listed.

Table 2

Collegiate Flight Students' Gender

Gender	Responses	Percentage of Responses
Male	71	75%
Female	24	25%
Prefer Not to Answer	0	0%
Gender Not Listed	0	0%

Question 2 of the research survey asked each flight student to indicate their current academic classification, in respect to the number of college credit hours that they have completed. Table 3 shows the distribution of the undergraduate students' years in school. Of the 95 total responses, 16 (17%) of the participants expressed that they were freshmen, 18 (19%) were sophomores, 27 (28%) were juniors, and 34 (36%) were seniors.

Table 3

Collegiate Flight Students' Completed Credit Hours

Academic Classification	Responses	Percentage of Responses
Freshman	16	17%
Sophomore	18	19%
Junior	27	28%
Senior	34	36%

Question 3 requested that participants indicate which class of FAA issued medical certificate that they held at the time of completing the survey. In addition to those flying with a BasicMed alternative medical certification (which is not applicable to commercial operations), the FAA offers three classes of medical certificates to pilots (Code of Federal Regulations, 2023). Each of the three classes of medical certificates have varying

requirements and years of applicability, in addition to the types of jobs one may pursue with that level of certificate. As Table 4 demonstrates, all of the survey's participants indicated that they had a medical certificate. The responses showed that 79 (83%) of the respondents held a first-class medical, 5 (5%) held a second-class, and 11 (12%) held a third-class medical.

Table 4

Collegiate Flight Students' Medical Certificate Class

Medical Certificate Class	Responses	Percentage of Responses
First	79	83%
Second	5	5%
Third	11	12%
None	0	0%

Question 4 requested that participants note which FAA pilot ratings and certificates that they held at the time of the survey. Table 5 outlines the received data. Being that the question allowed students to select more than one response, the total number of responses totaled more than the number of respondents. In descending order of most frequent response, 64 (67%) of participants indicated that they were a Private Pilot, 34 (36%) had an Instrument Rating, 32 (34%) were a Student Pilot, and 16 (17%) had a Commercial Pilot Certificate. Additionally, 11 (12%) of the respondents had a Multi-Engine Rating, 7 (7%) have a Certified Flight Instructor Certificate, 2 (2%) held an Airline Transport Pilot Certificate, and 1 (1%) held a certified Flight Instructor-Instrument Certificate. Additionally, 1 (1%) respondent selected Other as a response but did not provide further detail to elaborate on which unlisted rating or certificate that they held.

Table 5

Collegiate Flight Students' Pilot Ratings and Certificates

Certificates/Ratings	Responses	Percentage of Responses
Student Pilot	32	34%
Private Pilot	64	67%
Commercial Pilot	16	17%
Airline Transport Pilot	2	2%
Instrument Rating	34	36%
Multi-Engine Rating	11	12%
Certified Flight Instructor	7	7%
Certified Flight Instructor-Instrument	1	1%
Other	1	1%

Note. The totaled percentage of responses is greater than 100%, because this multiple choice question allowed for participants to select more than one answer.

Question 5 of the research survey asked participants to indicate how many flight hours that they have logged in total. Table 6 shows that most respondents, 66 (70%), had less than 200 hours of logged time in the cockpit. Out of all the responses, 10 (11%) had logged 0-49 hours, 24 (25%) had 50-99 hours, and 32 (34%) had logged 100-199 hours. Responses indicating that the participant have logged more than 200 hours totaled 29 (31%), with 18 (19%) of survey respondents having logged 200-299 hours, 7 (7%) tallying 300-399 hours, and 4 (4%) of participants having more than 400 hours of flight time.

Table 6

Collegiate Flight Students' Total Number of Flight Hours

Number of Hours	Responses	Percentage of Responses
0-99	34	36%
100-199	32	34%
200-299	18	19%
300-399	7	7%
400+	4	4%

The final question in the demographic section of the research survey focused on understanding participants' career aspirations. Except for one of the Other replies, which the participant's response was 'airport manager,' all the responses indicated that the students were pursuing a career as a pilot. Table 7 highlights a breakdown of the students' responses. Of these, 70 (74%) indicated that they want to be a commercial pilot, 16 (17%) want to be a corporate pilot, and 4 (4%) want to be a military pilot. The remaining responses showcased that the participants desire to pursue a different career path, with 3 of the 5 (5%) responses providing further information. 'Missionary Aid Pilot' and 'Fed Ex' were the two other explanatory responses, in addition to the previously noted respondent who wanted to be an airport manager.

Table 7

Collegiate Flight Students' Career Aspirations

Career Aspiration	Responses	Percentage of Responses
Commercial Pilot	70	74%
Corporate Pilot	16	17%
Military Pilot	4	4%
Other	5	5%

Collegiate Flight Students' Open-Ended Responses

The second part of the research survey requested that participants provide open-ended responses to five questions. Each response was reviewed by the researcher and subsequently coded to identify themes within the data. These themes were useful in better understanding collegiate flight students' surrounding mental health.

The first open- question asked participants to advise how they manage stress and anxiety. Each of the 95 participants highlighted techniques for how they handle these aspects of their lives, as well as the personal impact that these techniques have. Table 8

gives an overview of the themes identified by the researcher. There were eight different categories of stress and anxiety management categories that students noted that they employ, with many participants noting more than one category. Of the responses, 21 (22%) of participants noted that they use proper time management skills, 25 (26%) exercise, 19 (20%) spend time with family or friends, and 32 (34%) benefit from pursuing various other hobbies. These hobbies include, but are not limited to, reading, writing, spiritual focused efforts, listening to music, watching television, and playing video games. Other respondents, 29 (31%), said that spending some time alone relaxing and taking a break from their problems is a positive method for them, as well 3 (3%) who noted that they ignore the problem or its causes, and 4 (4%) that credited flying as a positive activity for them. The remaining 15 (16%) of responses indicated a comment that did not fit one of the other seven noted categories.

Table 8

Collegiate Flight Students' Mental Health Management Techniques

Stress and Anxiety Management Techniques	Responses	Percentage of Responses
Planning/Time Management	21	22%
Exercise	25	26%
Time With Family/Friends	19	20%
Various Hobbies	32	34%
Alone Time/Relaxation	29	31%
Ignoring The Issue(s)	3	3%
Flying	4	4%
Other	15	16%

Note. The totaled percentage of responses is greater than 100%, because this short-answer question allowed for participants to provide a response that had several different personal techniques noted.

The survey's second open-ended question highlights how participants' careers would change, in the event of the potential inability to receive or hold a medical

certificate. Table 9 showcases the respondents' backup career goals. A majority of responses, 49 (52%), indicated that participants would like to continue working in the aviation industry, even if they could no longer fly for a living. The types of roles that participants would hope to work in include, aviation safety, aircraft maintenance, air traffic controller, flight operations, airport manager, avionics technician, aviation journalist, among others. A few students indicated that they are pursuing additional skillsets out of the cockpit to be more marketable in their career, as well as to help overcome any changes that they may experience during it. There were 33 (35%) of participants that explicitly stated they would pursue a career in another industry, if they can no longer be a pilot. Additionally, 13 (14%) of respondents noted that they had not thought of a backup career option, nor noted an idea of what they thought they would be interested in pursuing.

Table 9

Collegiate Flight Students' Backup Career Goals

Backup Career Plan	Responses	Percentage of Responses
Aviation Industry	49	52%
Other Industry	33	35%
No Plans or Alternate Ideas	13	14%

Note: Due to rounding, the reflected percentages are greater than 100% of total responses.

The third open-ended question asks whether participants have ever been denied an FAA medical (of any class). As Table 10 showcases, only 4 (4%) of participants noted that they have had trouble with getting their medical certificate. Those who noted that they had experiences with medical certificate denial or had to take extra steps to get their certificate, credited a variety of causes. These students indicated that the additional

scrutiny in their individual cases were due to a color deficiency, childhood ADHD, Hypothyroidism, and habitual headaches. None of the responses indicated a mental health condition as the cause for a past medical certificate denial.

Table 10

Collegiate Flight Students' Medical Certificate Denial Experiences

Medical Denial/Extra Steps	Responses	Percentage of Responses
Yes	4	4%
No	91	96%

As highlighted by Table 11, the fourth open-ended question focuses on participants' experiences with Special Issuance medicals. Like the previous question, few participants, 4 (4%), have had troubles getting an FAA medical. The reasons participants expressed why they had a Special Issuance medical included Hypothyroidism, pre-menstrual pain and anxiety, childhood anxiety and depression, and a bleeding disorder. Interesting to note is that there was one respondent who does not currently have a Special Issuance medical but advised that they expected to soon have one due to depression.

Table 11

Collegiate Flight Students' Special Issuance Medical History

Hold a "Special Issuance" Medical	Responses	Percentage of Responses
Yes	4	4%
No	91	96%

Table 12 highlights participants' prevailing opinions surrounding the current aeromedical certification process and potential areas of improvement. The comments provided by the participants focused on a wide array of aspects within the aeromedical certification process, including aspects related to mental health. Of the five open-ended

questions, participants were collectively most descriptive when answering this prompt. Several novel and repeated thoughts were expressed during this question, with 37 (39%) of participants having mentioned mental health in their comments. The following is one student's comment, which showcases their perceived shortcomings of the current aeromedical certification process and how the FAA handles mental health issues among pilots:

> The stigma around mental health in the FAA is a touchy subject. As students we are expected to be on top of everything for the first time in our lives. We need people who are qualified to talk to about our stress and anxiety but out of fear of how the FAA will react [pilots] don't seek help. We are expected to just deal with it and press on causing untold levels of mental fatigue. And aviation is expensive, so a lot of students need jobs to meet payments. All this fatigue leads to a fragile mental state. So, the FAA needs to be much more vocal about allowing pilots to seek help from counselors and psychiatrists. When you have a 100% gayer tee [*sic*] that your certificate will have protections to seek help then the problem falls on the pilot to seek help (Boyd, 2023).

Of the remaining responses, 42 (44%) indicated that they had no suggestions for potential process revision, 5 (5%) responses suggested revisions that are related to other medical conditions not related to mental health, and 12 (13%) provided suggestions not related to other categories. Additionally, 23 (24%) said that they hoped the process would be less punitive to pilots. Nearly half, 17 (46%), of respondents emphasized mental health in their answers and included the desire for the current aeromedical process to be less punitive.

Table 12

Collegiate Flight Students' Aeromedical Certification Process Improvement Suggestions

Process Improvement Suggestions	Responses	Percentage of Responses
Mental Health Related	37	39%
Other Conditions	5	5%
Being Less Punitive to Pilots	23	24%
Other Aspects	12	13%
Not Sure/No Suggestions	42	44%

Note. The totaled percentage of responses is greater than 100%, because this short-answer question allowed for participants to provide a response that included several suggestions.

Collegiate Flight Students' Perceptions and Realities

The survey's third section asked that participants indicate their perceptions about mental health by answering thirteen Likert scale statements. Each question had five options for participants to rank their feelings, including Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), or Strongly Disagree (SD). Only one of the options was able to be selected by each respondent.

Table 13 shows a summary of data from four Likert scale statements. These four statements were numbers one through four within the corresponding section in the research instrument.

Slightly less than half (46%) of the students either disagreed or disagreed strongly in response to the Likert scale statement of "The FAA has my best interests in mind, in terms of mental health disorder diagnosis, disclosure, and treatment." Only 27% of respondents agreed, or strongly agreed, with the statement. Nearly a third (28%) were neutral. Conversely, nearly all the students (91%) indicated that they agreed or strongly

agreed that “It is dangerous for pilots to hide their mental health disorders.” More than two-thirds (68%) of respondents felt that “The current FAA medical certification process encourages dishonesty, in relation to mental health disorders.” Then of the remaining students, 22% were neutral and the remainder indicated that they disagreed or strongly disagreed. In reference to the final statement from this selection, “I am aware of pilot(s) who have been dishonest during the FAA medical certification process, in relation to mental health disorders,” most responses indicated that students agreed (25%), were neutral (27%), or disagreed (24%).

Table 13

Collegiate Flight Students’ Perceptions Regarding Mental Health Disclosure

Likert Scale Statement	SA	A	N	D	SD
The FAA has my best interests in mind, in terms of mental health disorder diagnosis, disclosure, and treatment.	6 (6%)	18 (19%)	27 (28%)	26 (27%)	18 (19%)
It is dangerous for pilots to hide their mental health disorders.	53 (56%)	33 (35%)	8 (8%)	1 (1%)	0 (0%)
The current FAA medical certification process encourages dishonesty, in relation to mental health disorders.	26 (27%)	39 (41%)	21 (22%)	6 (6%)	3 (3%)
I am aware of pilot(s) who have been dishonest during the FAA medical certification process, in relation to mental health disorders.	12 (13%)	24 (25%)	26 (27%)	23 (24%)	10 (11%)

Note. Due to rounding, the reflected percentages in the first and third statements are less than 100% of total responses.

Table 14 summarizes data from three Likert scale statements. These three statements were numbers five through seven within the corresponding section in the research instrument.

Most students felt that their flying careers were tied to their ability to successfully complete an FAA medical examination and receive a medical certificate. Of the responses, 85% indicated that they agreed or strongly agreed to the statement of, "If I failed to receive an FAA medical at the time of my physical examination, then my flying career would be in jeopardy." Only 4% disagreed or strongly disagreed with that statement. Similarly, most students felt that their mental health was tied to their ability to fly. Out of the 95 participants, 71% noted that they either agreed or strongly agreed that "If I told an Aviation Medical Examiner (AME) that I was depressed or anxious, then I would no longer be able to fly." A fifth of students (20%) were neutral to the statement and 9% disagreed (there were none that strongly disagreed). In relation to the second open-ended question, participants were asked to indicate their perceptions towards a backup career plan, if they are no longer able to fly (either temporarily or permanently). More than half (61%) of students have "…thought about what career I would pursue if I was denied an FAA medical certificate."

Table 14

Collegiate Flight Students' Perceptions Regarding Mental Health and Career Impacts

Likert Scale Statement	SA	A	N	D	SD
If I failed to receive an FAA medical at the time of my physical examination, then my flying career would be in jeopardy.	39 (41%)	42 (44%)	10 (11%)	3 (3%)	1 (1%)
If I told an Aviation Medical Examiner (AME) that I was depressed or anxious, then I would no longer be able to fly.	30 (32%)	37 (39%)	19 (20%)	9 (9%)	0 (0%)
I have thought about what career I would pursue if I was denied an FAA medical certificate.	23 (24%)	35 (37%)	11 (12%)	19 (20%)	7 (7%)

Table 15 indicates students' feelings towards three Likert scale statements. These three statements were numbers eleven through thirteen within the corresponding section in the research instrument.

Most students (81%) indicated that they manage their mental health well. Conversely, 15% were neutral to the statement of "I adequately manage my stress and any mental health challenges that I face," whereas 4% disagreed or strongly disagreed. Less than half (41%) of the respondents thought that "My collegiate flight program has adequate mental health related resources." Nearly a third (32%) were neutral to that statement and 27% thought that their program had inadequate mental health resources. A majority of responses (65%) agreed or strongly agreed that "My professors, flight instructors, and others within my collegiate flight program care about my mental health." Less than a fifth (17%) indicated that they disagreed or strongly disagreed with that statement.

Table 15

Collegiate Flight Students' Perceptions Regarding Mental Health Management Strategies

Likert Scale Statement	SA	A	N	D	SD
I adequately manage my stress and any mental health challenges that I face.	28 (29%)	49 (52%)	14 (15%)	2 (2%)	2 (2%)
My collegiate flight program has adequate mental health related resources.	5 (5%)	34 (36%)	30 (32%)	18 (19%)	8 (8%)
My professors, flight instructors, and others within my collegiate flight program care about my mental health.	22 (23%)	40 (42%)	17 (18%)	10 (11%)	6 (6%)

Table 16 shows a summary of data from three Likert scale statements. These three statements were numbers eight through ten within the corresponding section in the research instrument.

A little more than half (53%) of students felt that they "…have a good understanding of the FAA medical certification process." Nearly a third of respondents (32%) indicated a neutral understanding of the current medical certification process. More than two thirds (69%) agreed or strongly agreed to the statement of "The current FAA medical certification standards are uncertain and subjective, in relation to mental health disorders." Conversely, less than a tenth (7%) felt that these standards are clear and not subjective to interpretation. And most (84%) students believed that "The FAA mental health certification standards should be reviewed and potentially revised." Very few (2%) students either disagreed or disagreed with that statement and less than a fifth (14%) were neutral.

Table 16

Collegiate Flight Students' Perceptions Regarding Aeromedical Certification Process Revision

Likert Scale Statement	SA	A	N	D	SD
I have a good understanding of the FAA medical certification process.	11 (12%)	39 (41%)	30 (32%)	14 (15%)	1 (1%)
The current FAA medical certification standards are uncertain and subjective, in relation to mental health disorders.	22 (23%)	44 (46%)	22 (23%)	7 (7%)	0 (0%)
The FAA mental health certification standards should be reviewed and potentially revised.	41 (43%)	39 (41%)	13 (14%)	1 (1%)	1 (1%)

Note. Due to rounding, the reflected percentages are greater than (first statement) or less than (second statement) than 100% of total responses.

CHAPTER V

CONCLUSIONS

Chapter V highlights the connection between mental health and collegiate flight students, with quantitative and qualitative data derived from a twenty-four-question survey. The participating students' responses noted in Chapter IV showcase their perceptions surrounding the studied topic, in addition to demographics and other pertinent information. Additionally, the comprehensive literature review enables readers of this study to better understand a variety of aspects related to the research topic, including, Collegiate Flight Program Requirements, Fitness for Flight, Mental Health and Aeronautical Decision Making, Mental Health and Pilots, Medical Certification Waiver Pathways, Mental Health Incidents and Resources, as well as Continuous Improvement at the FAA.

Summary of Research

This research study highlighted students' perceptions through a three-section survey, guided by the researcher's four identified research questions noted in Chapter I. The research survey collected participants' experiences with mental health (particularly anxiety and depression) through their response to multiple choice questions, open-ended questions, as well as Likert scale statements. Surveys were sent to

representatives at 66 collegiate UAA-affiliated flight programs with four-year Professional Pilot (or similar) degree options. In total, 95 students participated in the study, each of whom completed the survey in its entirety.

Based on the data presented in Chapter IV, the following demographic data summarizes the participating population of this research study. Of the 95 respondents, 75% indicated that they were male and the remaining 25% indicated that they identify as female. Academic classification amongst the participants was skewed towards participants who were older (juniors or seniors, versus freshmen or sophomores). Nearly a fifth (17%) of the students indicated that they were freshman, with 19% noting they were sophomores. Twenty-eight percent were juniors and the remaining 36% of participants were seniors. As a result of the wide distribution in academic classification, it is expected that an array of flying experiences and perceptions regarding mental health were communicated by those who completed the research survey.

A majority (83%) of students held FAA first-class medical certificates and all students indicated that they had a medical certificate. As a result, all participants had at least a basic understanding of the FAA's medical requirements, including those related to mental health. Additionally, participants held a variety of FAA pilot ratings or certificates. Thirty-four percent of the respondents noted that they were student pilots, and more than two-thirds (67%) stated that they had a private pilot certificate. Resultantly, the survey's participants were experienced in determining whether they are personally fit to fly, as well as which internal and external factors affect their emotional state at any given time. A considerable percentage (70%) of students have logged less than 200 hours of flight time and only 4% have logged more than 400 hours. Most (74%)

indicated that their career goal was to become a commercial pilot, meaning that they would ultimately be required to hold first- or second-class medicals to fly for a profession.

The data that was collected from the survey was used to summarize the following research questions:

RQ1: Does the current aeromedical process encourage collegiate flight students to either not disclose, ignore, or self-treat conditions related to mental health and fitness?

RQ2: Do collegiate flight students view disclosing mental health struggles as having a negative impact upon their careers?

RQ3: What strategies do collegiate flight students use to manage their mental health and what are these strategies' effectiveness?

RQ4: Do collegiate flight students feel there is tangible benefit to pilots and the public if the current first-class medical certification standards related to mental health aspects are revised?

Research Question 1: Does the current aeromedical process encourage collegiate flight students to either not disclose, ignore, or self-treat conditions related to mental health and fitness?

Collegiate flight students perceived that mental health has an impact upon flying. In response to the Likert statement, "It is dangerous for pilots to hide their mental health disorders," 56% of students strongly agreed and 35% agreed. The statement did not specifically detail which mental health disorders were referenced, so participants could have considered any disorder, from mild to severe, when indicating their perceptions.

Yet, even with more than 90% of participants agreeing about the potential dangers of pilots hiding mental health disorders, nearly seven out of ten students felt that the current process encourages airmen to hide material facts. Sixty-eight percent of those surveyed either agreed or strongly agreed with, “The current FAA medical certification process encourages dishonesty, in relation to mental health disorders.” As a result, there is the potential for pilots to have either not disclosed mental health concerns during a medical examination, have ignored their personal issues, or have utilized alcohol or drugs as a way of coping.

This research survey showcased that there have been unintended consequences to the aeromedical certification process, which have been the result of the perception that the process encourages dishonesty amongst applicants. While 62% of participants were neutral, disagreed, or strongly disagreed to the Likert statement, “I am aware of pilot(s) who have been dishonest during the FAA medical certification process, in relation to mental health disorders,” 13% strongly agreed and 25% agreed. This indicates that there is a statistically relevant percentage of applicants who have not been, or possibly will not be, entirely honest when working with their AMEs. This could have a negative impact upon the pilots who have ignored these issues, in addition to other pilots and members of the general population.

Out of these same respondents, they all had their own unique methods of managing stress and anxiety. Overall, the identified mental health management methods were perceived by the researcher as being positive coping mechanisms, that did not have negative effects to the respondent or those around them. The categories of management techniques noted by students included planning/time management (22%), exercise (26%),

time with family/friends (20%), various hobbies (34%), alone time/relaxation (31%), ignoring the issue (3%), flying (4%), and other (16%). No response indicated that any of those that completed the survey rely upon alcohol, drugs, or other substances as a practiced coping mechanism. Due to this, little data supports a conclusion whether collegiate flight students cope by "self-treating" with alcohol, drugs, or other substances.

Research Question 2: Do collegiate flight students view disclosing mental health struggles as having a negative impact upon their careers?

Most (85%) students felt that "If I failed to receive an FAA medical at the time of my physical examination, then my flying career would be in jeopardy." Forty-one percent of participants strongly agreed and 44% agreed with that statement, indicating a perceived tie between one's ability to pass a medical exam and the ability to fly. It also showcases students' feelings surrounding the importance of receiving a medical certificate at the time of their initial examination, rather than going through additional testing or an arduous review process.

Many students felt that if they expressed concern with an aspect of their health to the physician conducting the exam, then a negative outcome would arise. Over two-thirds (71%) of the participants agreed or strongly agreed with the statement, "If I told an Aviation Medical Examiner (AME) that I was depressed or anxious, then I would no longer be able to fly." Nearly one-third (31%) of the students strongly agreed with the statement. This is evidence that supports the assumption that mental health is a common concern amongst flight students.

In response to the statement of "I have thought about what career I would pursue if I was denied an FAA medical certificate," more than half (61%) of the students agreed

or strongly agreed. This showcases that respondents have thought about the possibility of not being able to fly anymore and what the causes could be. Similarly, the second open-ended question allowed students to elaborate on any thought they have given to a potential backup career. Most (52%) would hope to stay in the aviation industry and the remaining participants would work in another industry or were unsure what career they would pursue.

Research Question 3: What strategies do collegiate flight students use to manage their mental health and what are these strategies' effectiveness?

According to the participants of this research study, a clear majority (81%) felt that they successfully navigate through life's challenges. Only 4% of respondents disagreed or strongly disagreed with the statement, "I adequately manage my stress and any mental health challenges that I face." As a result, it can be concluded that the methods which collegiate flight students presently employ to manage their stress and any mental health challenges are largely effective.

These mental health management techniques varied amongst students, with many using more than one strategy. The three techniques that were expressed most often by the students were hobbies of varying types (34%), alone time/relaxation (31%), and exercise (26%). Other techniques indicated by the other students were, planning/time management (22%) and time with family/friends (20%). These results demonstrate that mental health management strategies are more effective when tailored to the individual, but there are common attributes shared amongst all students.

In response to, "My collegiate flight program has adequate mental health related resources," 41% of students agreed or strongly agreed. Thirty-two percent answered that

they were neutral, possibly indicating that these students were unaware of or were indifferent to any available resources that their program may offer. Twenty-seven percent of students felt that their programs do not currently have adequate mental health related resources.

Additionally, staff within these programs are other factors that can affect students' mental health. Seventeen percent of students disagreed or strongly disagreed with the statement, "My professors, flight instructors, and others within my collegiate flight program care about my mental health." Conversely, most (65%) students felt that program staff were supportive towards their mental health.

Research Question 4: Do collegiate flight students feel there is tangible benefit to pilots and the public if the current first-class medical certification standards related to mental health aspects are revised?

There was more negative sentiment than there positive from the responding students, regarding how the FAA currently handles mental health issues amongst pilots. While 28% were neutral to the statement, "The FAA has my best interests in mind, in terms of mental health disorder diagnosis, disclosure, and treatment," 27% disagreed and 19% strongly disagreed. Nearly half of the collegiate flight student population was skeptical of whether the FAA has their best interests in mind.

Most (53%) students agreed or strongly agreed to, "I have a good understanding of the FAA medical certification process." Nearly a third (32%) were neutral, possibly indicating that the process could be clarified, or a knowledge gap exists amongst those students. Sixteen percent of participants disagreed or strongly disagreed with the

statement, expressing that they do not have a good understanding of the process and its requirements.

Few (7%) students disagreed or strongly disagreed with the Likert statement, "The current FAA medical certification standards are uncertain and subjective, in relation to mental health disorders." Sixty-nine percent agreed or strongly agreed, highlighting the possible need to clarify existing certification standards to collegiate flight students.

Overwhelmingly, 84% of students agreed or strongly agreed that "The FAA mental health certification standards should be reviewed and potentially revised." Only 2% of participants disagreed or strongly disagreed, indicating that students perceive there to be a gap between the FAA's current mental health standards and what students feel they could (or should) be in the future.

While not focused specifically on first-class standards (mental health aspects do not significantly vary between the three classes of FAA medicals), students provided a variety of possible process improvement suggestions related to the current FAA aeromedical certification process. Forty-four percent of the comments had no suggestion, in response to, "Do you have any suggestions for how to improve the current FAA aeromedical certification process (including aspects related to mental health)?" In addition to comments related to various mental health conditions or requirements, another leading theme derived from this open-ended question was that students felt the current aeromedical certification process is punitive towards pilots. Twenty-four percent of responses referenced that sentiment, with those comments frequently being tied to thoughts surrounding mental health.

Conclusions

By focusing on existing literature and data collected through the research survey, this study sought to foster an understanding of United States collegiate flight students' perceptions and realities related to anxiety and depression. Through this research, the researcher attempted to both understand perceived and possible issues related to mental health (particularly anxiety and depression) within collegiate flight programs, as well as showcase the students' viewpoints towards several related aspects.

Several important aspects were highlighted through review of existing literature in Chapter II. Among other topics, the literature review focused on, mental health incidents and resources, the frequency of mental health conditions among pilots, and the FAA medical certification process. In summary, mental health and flying is an important research topic that is of great value to a variety of stakeholders. Additionally, it's a topic of growing interest, due to recent aircraft accidents that have had mental health issues attributed as causal factors, including at least one involving a collegiate flight student (Wildes, 2022). Contributing to this issue is the number of pilots who do not disclose known medical issues. As noted in the research, "The FAA acknowledges that there is, "…a fraction of the aviator population who most likely are flying with the condition and medications without out [FAA] knowledge" (Durham, 2018). As one of its most important ongoing actions, the agency attempts to ensure the highest level of airman compliance and fitness for flight through comprehensive recurring aeromedical examinations (Federal Aviation Administration, n.d.-d). Not only is the FAA responsible for assessing one's ability to fly safely, but pilots themselves also play a crucial role in

determining whether they themselves are physically and mentally capable of flying at a certain point in time (Aircraft Owners and Pilots Association, n.d.-b).

These summarized elements, as well as others identified by the researcher, were further examined through the research survey, *Mental Health and Collegiate Flight Programs: Understanding the Perceptions and Realities of Anxiety and Depression* (Appendix B). The goal of the research survey was to identify and highlight collegiate flight students' thoughts related to the topic.

Through review of the 95 participating collegiate flight students' contributions, several conclusions can be made. Among most distinctive are, there is a perceived benefit to not disclosing or ignoring mental health and fitness issues, mental health is a primary concern of students, students' mental health is impacted (positively or negatively) by a variety of factors, and students feel that change would be beneficial, as it relates to the current FAA medical certification process.

Students perceived that it is dangerous for pilots to hide their mental health disorders. Even so, 68% believed that the current FAA medical certification process encourages dishonesty, in relation to mental health disorders. Thirty-eight percent of students indicated that they are aware of others who have been dishonest during the process, regarding mental health disorders. And based on students' responses, this expressed dishonesty can be rationalized through the possible repercussions for expressing concerns during a medical exam, or another time. Eighty-five percent of students felt their flying career would be in jeopardy if they did not receive a medical certificate at the time of their examination. Since more than two-thirds of students felt the current FAA medical certification process encourages dishonesty, the barriers which

encourage this negative behavior are a point of concern for the industry. One student provided related input though their feedback, “AMEs should have more transparency in the decision-making process of applicant acceptance. The trust relationship between both parties is already in a decrepid [*sic*] state.” Based upon this, a system that is more consultative and trust-based between airmen and their AMEs could be an attractive future model for aeromedical certification.

Just as most students indicated that their flying privileges would be affected by failing to receive a medical on their first attempt, 71% of students felt that if they identified themselves as having depression or anxiety to their AME, then they would no longer be able to fly. One student noted, “Yes, mental health seems to always be a problem for a lot of people. But getting help generally causes you to be unable to get your medical. The FAA should be more open to investigating the severity of the problem and be able to determine if it does not pose a problem to their flying.” As further evidence to the point, another student simply stated, “Actually make pilots feel like they can get help…” Through summarization of these comments and other reviewed data points, it is clear that mental health is a primary concern of collegiate flight students, and they foresee potential barriers for pilots seeking help.

Further evidence to students’ focus on mental health is their understanding of how stress, anxiety, and other factors affect them. Each of the 95 participants indicated the techniques that they personally use to help manage their own mental health. Techniques ranged from time management, to exercise, to spending time with loved ones, with many respondents simultaneously referencing several techniques. Not only are students mindful of the impact that they have upon their own mental health, but they are also cognizant of

its other factors. Fifty-nine percent of respondents were neutral or disagreed that their collegiate flight programs had adequate mental health related resources. As a result, there is opportunity for these programs to assess their offerings and improve them as needed. Additionally, it is an opportune time for programs to communicate directly with students. This open dialogue will allow programs to better understand their students' perceptions and potential concerns towards mental health.

A concern shared by 69% of the study's participants is that the current FAA medical certification standards are uncertain and subjective, in relation to mental health disorders. Additionally, eighty-four percent of participating students felt that the FAA mental health certification standards should be reviewed and potentially revised. As a result, the certification standards, if reviewed or written, have the opportunity to become more clearly worded. More concise wording of the medical standards would benefit those that they govern, leaving no doubt about the effects of any actions that pilots take in relation to their physical and mental health conditions.

Summary

Mental health is perceived by collegiate flight students as an important topic within their programs. According to input received from 95 United States-based students that participated in the research study, mental health has an impact both upon their daily lives, as well as their future careers.

Four key takeaways from the research study are: (1) there is a perceived benefit to not disclosing or ignoring mental health and fitness issues, (2) mental health is a primary concern of students, (3) their mental health is impacted (positively or negatively) by a

variety of factors, and (4) students feel that change would be beneficial, as it relates to the current FAA medical certification process.

As a result of these data-derived conclusions, there are several impacts to collegiate flight students and the programs that they are a part of. These include current and future repercussions from undisclosed mental health disorders within collegiate flight programs, as well as the impact of various mental health aspects on collegiate flight students once they are in their flying careers post-graduation.

Recommendations

Based on the results of the survey, in addition to conclusions drawn from that data, the researcher advises the following five recommendations.

Recommendation 1:

A majority (71%) of students recognized the tie between mental health and their ability to fly (Table 14). As a result of the correlation between one's mental health and other aspects of well-being to their flying careers, flight students should begin or continue creating healthy habits. As it pertains to mental health, students should foster habits that allow them to manage their current related issues, as well as ones that may occur in the future. In addition to practicing commonly utilized mental health management techniques (Table 8), there are tools which aviation students could incorporate in their life to better deal with mental health concerns, including peer support groups. Additionally, if they are not already familiar with the current aeromedical certification process' mental health related aspects, students should work to bolster their understanding. Their familiarity with the subject will allow them to manage potential mental health related concerns more effectively and in a manner that is conducive with the FAA's policies and oversight.

Recommendation 2:

By knowing what can happen when mental health is stigmatized or ignored amongst its student population, collegiate flight programs should begin, or continue, fostering conversations surrounding mental health and flying. Each program should conduct research within their own programs, to see how their students' perceptions vary from the sample population studied in this research. From these conversations and additional research efforts, collegiate flight programs should create (or tailor existing) resources to address these issues, as well as strive to anticipate potential mental health related problems prior to them occurring.

Recommendation 3:

Being that mental health (and other health related issues) could sideline pilots from the cockpit, leaving them temporarily or permanently without an income, programs should be mindful about encouraging flight students to pursue an all-encompassing education. While most (52%) students noted that they would be interested in staying within the aviation industry if they were no longer able to fly, 35% said they would pursue something outside of the industry. A common identified role in the aviation industry and outside of it was management or business related in some fashion. So, programs that do not have a business focus within their Professional Pilot bachelor's degree option should consider incorporating those classes or further expand their related course offerings. This will allow students to have a way to transition to another career more easily if needed.

Recommendation 4:

The findings of this research document are presented in such a way to be useful for collegiate flight programs and students, as well as various governmental and industry-trade organizations. The latter groups can use the examined literature (Chapter II) and findings derived from student perceptions (Chapter IV) to review and potentially revise existing regulations surrounding mental health, flying, and aeromedical certification. A common theme from the students' comments, shared by 24% of participants, was that they feel that the current process is punitive to pilots (Table 12). So, lawmakers and others should be mindful to that aspect when reviewing this document, as well as other examples that showcase the current state of regulations surrounding mental health and aviation. If the current regulations are revised so that pilots perceive them to be less punitive and more trust-based, then it is likely that more pilots would be honest regarding their mental health conditions. As a result, this dialogue would encourage more pilots to be transparent with mental health related concerns that could negatively impact safety of flight, if left untreated.

Recommendations for Further Research

1. Further research studies are needed to determine whether the current mental health standards for aeromedical certification are a barrier to entry, or a barrier for students in completing Professional Pilot (and similar) bachelor's degrees. Additionally, an understanding of whether mental health issues are a contributing factor for students who underperform in classes, fail to graduate, or are delayed from their original plan of study is important to gain. Results from this research

would allow researchers to better understand the link between flight students' mental health and their completion of coursework.

2. A further study is recommended to explore the causes of mental health issues within collegiate flight programs. This research study should seek to answer whether collegiate flight students suffer from anxiety and depression at a differing rate than the non-flying collegiate student population and whether the non-flying collegiate student population decided not to fly because of these conditions. Additionally, this study should attempt to understand the causes for anxiety and depression within flight programs, including whether the symptoms are situational and whether they are caused by factors that could be controlled.
3. Additional research effort should be put towards understanding how transparent collegiate flight students are with any mental health challenges they face. By understanding how students talk about or hide their challenges, further clarity will exist regarding how the current FAA medical process may (or may not) encourage applicants to be dishonest or withhold information. Results will also show how students seek help when they decide to do so.
4. Another topic that the researcher feels should be focused on is how well collegiate flight programs support their students' mental health and what strategies that programs can employ to better support their students. This research would focus on programs that have already implemented classes, peer-to-peer support groups, and other mental health management methods, in addition to airlines and other pilot-focused groups that have incorporated mental health support strategies into their operations.

5. Since some pilots perceive that they are unable to speak out about their mental health challenges, fearing negative consequences, further efforts should be made towards understanding how pilots cope with their issues. This research would show both the perceived positive, as well as negative, avenues via which pilots attempt to manage their mental health. A focus of this research should be towards how pilots self-treat (with alcohol, or drugs), to mask their personal challenges. This research would include an emphasis towards recruiting undergraduate flight students for their participation.

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APPENDICES

APPENDIX A:

CONSENT FORM

Mental Health and Collegiate Flight Programs:
Understanding the Perceptions and Realities of Anxiety and Depression

Mr. Grant Boyd, *Oklahoma State University, Aviation and Space doctoral candidate,* and Dr. Timm Bliss, *Oklahoma State University, Professor – Aviation and Space,* are inviting you to take part in a research study regarding **Mental Health and Collegiate Flight Programs**.

Background Information *(please read thoroughly)*:

As it is written currently in 14 CFR Part 67-Medical Standards and Certification, the FAA Aeromedical Process requires that appointed and appropriately qualified healthcare practitioners performing an aeromedical exam focus their efforts on an inclusive examination of the applicant's health.

In addition to physical aspects, this examination focuses on the mental health of an applicant, so that the examiner can better understand the applicant's overall health and make a sound determination surrounding their application. In addition to physically disqualifying conditions, there are four mental health disqualifying diagnoses: (1) a personality disorder, (2) a psychosis, (3) a bipolar disorder, and (4) substance dependence. In addition to these diagnoses, anxiety and depression symptoms, as well as formal diagnoses, are subject to an applicant's disqualification.
The repercussions of medical certification denial can be both career and life defining. Resultantly, applicants can be hesitant to many aviators are careful to balance their personal wellbeing with careful consideration towards their futures. Arguably, there is not a time in one's life that is more professionally defining than during their collegiate tenure.

For flight students enrolled in university professional flight (or similar) programs, the pursuit of flight ratings, and ultimately a flying job post-graduation, are inexplicably tied to their ability to be granted and continually hold an FAA first-class medical certificate, or in some cases a second-class medical certificate.

Pundits of the current aeromedical process have called for reform, based upon review of the current process, and identifying areas for potential improvement. Some of the drive for change has been the direct byproduct of public cases relating to pilots, as well as prospective pilots, and their struggles with mental health.

Since October of 2021, some of the expanded attention towards pilots' mental health has been the result of a high-profile incident involving a freshman collegiate flight student, John Hauser. The nineteen-year-old University of North Dakota private pilot's intentional airplane crash has since cast light to the juxtaposition of mental health within collegiate flight programs across the country. As a result, dialogue around mental health amongst collegiate flight students has become more prevalent.

Voluntary Consent:

Your participation in this research is entirely voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time.

Exclusion/Inclusion Requirements:

To participate in this study, you must be: (1) a currently enrolled collegiate flight student, (2) holder of a valid FAA medical certificate, in the process of applying for one, or are familiar with the certifications' requirements.

Procedures:

If you agree to be in this study, we ask that you to do the following things: (1) provide consent to participate and (2) complete the survey in its entirety.

Participation Time:

It will take you approximately 10-15 minutes to complete the survey.

Risks and Benefits:

To offset any risk, such as loss of privacy, you are asked to keep your survey answers and all information confidential. As the Principal Investigators, Grant and I are also obligated to ensure your privacy by safeguarding your identity and any information you supply. There are no direct benefits to you. However, the information obtained through this questionnaire will help to help foster dialogue surrounding mental health and collegiate flight programs.

Protection of Privacy and Confidentiality:

All survey data will be handled in a confidential manner to prevent loss of privacy. All data analysis will be stored in an encrypted and password protected database on a secure university server. Only the two primary investigators will have access to information linked to subject identifiers. All survey data will then be deleted at the end of study completion. The results of this study may be published in scientific journals, professional publications, or educational presentations; however, no individual participant will be identified.

Contact Information:

The Institutional Review Board (IRB) for the protection of human research participants at Oklahoma State University has reviewed and approved this study. If you have questions about the research study itself, please contact Dr. Bliss by telephone at 405-334-1206 or by email at timm.bliss@okstate.edu. If you have questions about your rights as a research

volunteer or would simply like to speak with someone other than myself, please contact the IRB at 405-744-3377 or by email at irb@okstate.edu. All reports or correspondence will be kept confidential.

Consent:

By participating in the study, you indicate that you have read the information written above, been allowed to ask any questions, and you are voluntarily choosing to take part in this research. You are at least 18 years of age or older. You do not give up any legal rights by taking part in this research study. You have the right to stop the survey at any point, for any reason. If you exit the survey prior to completion, your partial responses will be recorded.

The survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device. You may save your progress and return to complete the survey later from the same device.

The more complete responses we receive, the better we will be able to understand the perceptions and realities surrounding mental health (particularly anxiety and depression) among collegiate flight students. The researchers are personally grateful for the information that you contribute surrounding the topic.

By clicking below, you acknowledge that your participation is voluntary, that you are at least 18 years of age, and that you are aware that you may choose to exit the survey at any time and for any reason.

APPENDIX B:

RESEARCH INSTRUMENT

Mental Health and Collegiate Flight Programs:

Understanding the Perceptions and Realities of Anxiety and Depression

Please answer the following questions to the best of your ability. Your answers will be kept confidential.

DEMOGRAPHICS

1. What is your gender?
   - [ ] Male
   - [ ] Female
   - [ ] Prefer Not to Answer
   - [ ] Gender Not Listed

2. What is your current academic classification, in terms of completed credit hours?
   - [ ] Freshman
   - [ ] Sophomore
   - [ ] Junior
   - [ ] Senior

3. What class of FAA medical certificate do you currently hold?
   - [ ] First
   - [ ] Second
   - [ ] Third
   - [ ] None

4. What FAA Pilot Certificates/Ratings do you currently hold (check all that apply)?
   - [ ] Student Pilot
   - [ ] Private Pilot
   - [ ] Commercial Pilot
   - [ ] Airline Transport Pilot
   - [ ] Instrument Rating
   - [ ] Multi-Engine Rating
   - [ ] Certified Flight Instructor
   - [ ] Certified Flight Instructor-Instrument
   - [ ] Other (_____)

5. Approximately how many flight hours have you logged in total?
   - [ ] 0-49
   - [ ] 50-99
   - [ ] 100-199
   - [ ] 200-299
   - [ ] 300-399
   - [ ] ≥ 400

6. What is your career aspiration?
   - [ ] Commercial pilot
   - [ ] Corporate Pilot
   - [ ] Military Pilot
   - [ ] Other (_____)

OPEN-ENDED

1. How do you manage stress and anxiety?

   _____
   _____
   _____
   _____
   _____

2. What is your backup career goal, in the event of a potential inability to receive medical certification?

   _____
   _____
   _____
   _____
   _____

3. Has your application for an FAA medical certificate ever been denied? If so, what was the reason for denial?

   _____
   _____
   _____
   _____
   _____

4. Do you currently hold a “Special Issuance” Medical? If so, what condition(s)?

   _____
   _____
   _____
   _____
   _____

5. Do you have any suggestions for how to improve the current FAA aeromedical certification process (including aspects related to mental health)? If so, please explain.

   _____
   _____
   _____
   _____
   _____

LIKERT SCALE

Please indicate your perceptions using the following scale:

Strongly Agree=SA, Agree=A, N=Neutral, Disagree=D, Strongly Disagree=SD

1. The FAA has my best interests in mind, in terms of mental health disorder diagnosis, disclosure, and treatment.

   [ ] SA [ ] A [ ] N [ ] D [ ] SD

2. It is dangerous for pilots to hide their mental health disorders.

   [ ] SA [ ] A [ ] N [ ] D [ ] SD

3. The current FAA medical certification process encourages dishonesty, in relation to mental health disorders.

   [ ] SA [ ] A [ ] N [ ] D [ ] SD

4. I am aware of pilot(s) who have been dishonest during the FAA medical certification process, in relation to mental health disorders.

   [ ] SA [ ] A [ ] N [ ] D [ ] SD

5. If I failed to receive an FAA medical at the time of my physical examination, then my flying career would be in jeopardy.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

6. If I told an Aviation Medical Examiner (AME) that I was depressed or anxious, then I would no longer be able to fly.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

7. I have thought about what career I would pursue if I was denied an FAA medical certificate.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

8. I have a good understanding of the FAA medical certification process.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

9. The current FAA medical certification standards are uncertain and subjective, in relation to mental health disorders.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

10. The FAA mental health certification standards should be reviewed and potentially revised.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

11. I adequately manage my stress and any mental health challenges that I face.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

12. My collegiate flight program has adequate mental health related resources.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

13. My professors, flight instructors, and others within my collegiate flight program care about my mental health.

[ ] SA [ ] A [ ] N [ ] D [ ] SD

APPENDIX C:

RECRUITMENT EMAIL

Dear Collegiate Flight Program Faculty Member,

Mr. Grant Boyd (doctoral candidate) and Dr. Timm Bliss (faculty dissertation advisor), Oklahoma State University, are conducting a national research study designed to examine collegiate flight students' perceptions surrounding mental health, particularly anxiety and depression. The participants of this study will consist of United States collegiate flight students at private and public 4-year universities with a UAA affiliation. The flight students (participants) will complete a brief four-page research questionnaire, which is expected to take roughly ten to fifteen minutes to complete. That survey and consent form are attached for your review.

The final research report (doctoral dissertation) will be completed by the primary researcher, Mr. Grant Boyd.

The researchers sincerely request flight students' participation in this national study. Please:

- Forward the noted survey questionnaire link [highlighted yellow and hyperlinked in sent email] to your collegiate flight students for completion
    - The link includes an inclusive consent form, as well as the survey itself for students who decide to participate

Your, and your students', willingness to support this research study (doctoral dissertation) is greatly appreciated. Oklahoma State University, Office of University Research Compliance, has approved this research study. If you have any questions surrounding this study, please do not hesitate to contact me (grant.boyd@okstate.com/316-869-5497) or Dr. Timm Bliss (timm.bliss@okstate.edu/405-334-1206).

Humbly,

Grant Boyd, Doctoral Candidate

Oklahoma State University

Aviation and Space Education

APPENDIX D:
APPROVAL OF IRB APPLICATION

Oklahoma State University Institutional Review Board

Date:	10/19/2022
Application Number:	IRB-22-436
Proposal Title:	UNDERSTANDING UNITED STATES COLLEGIATE FLIGHT STUDENTS' PERCEPTIONS AND REALITIES OF ANXIETY AND DEPRESSION
Principal Investigator:	Grant Boyd
Co-Investigator(s):	
Faculty Adviser:	Timm Bliss
Project Coordinator:	
Research Assistant(s):	
Processed as:	Exempt
Exempt Category:	

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,

Oklahoma State University IRB

Dear Collegiate Flight Program Faculty Member,

Mr. Grant Boyd and Dr. Timm Bliss (faculty dissertation advisor), Oklahoma State University are conducting a national research study designed to examine collegiate flight students' perceptions surrounding mental health, particularly anxiety and depression. The participants of this study will consist of US collegiate flight students at private and public 4-year universities with a UAA affiliation. The flight students (participants) will complete a brief four-page research questionnaire, which is expected to take roughly ten to fifteen minutes to complete. That survey is attached for your review.

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Humbly,

Grant Boyd, *Doctoral Candidate*

Oklahoma State University

Aviation and Space Education

Approved: 10/19/2022
Protocol #: IRB-22-436

Mental Health and Collegiate Flight Programs:
Understanding the Perceptions and Realities of Anxiety and Depression

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Approved: 10/19/2022
Protocol #: IRB-22-436

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All survey data will be handled in a confidential manner to prevent loss of privacy. All data analysis will be stored in an encrypted and password protected database on a secure university server. Only the two primary investigators will have access to information linked to subject identifiers. All survey data will then be deleted at the end of study completion. The results of this study may be published in scientific journals, professional publications, or educational presentations; however, no individual participant will be identified.

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Consent:

Approved: 10/19/2022
Protocol #: IRB-22-436

By participating in the study, you indicate that you have read the information written above, been allowed to ask any questions, and you are voluntarily choosing to take part in this research. You are at least 18 years of age or older. You do not give up any legal rights by taking part in this research study. You have the right to stop the survey at any point, for any reason. If you exit the survey prior to completion, your partial responses will be recorded.

The survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device. You may save your progress and return to complete the survey later from the same device.

The more complete responses we receive, the better we will be able to understand the perceptions and realities surrounding mental health (particularly anxiety and depression) among collegiate flight students. The researchers are personally grateful for the information that you contribute surrounding the topic.

By clicking below, you acknowledge that your participation is voluntary, that you are at least 18 years of age, and that you are aware that you may choose to exit the survey at any time and for any reason.

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VITA

Grant Mitchell Boyd

Candidate for the Degree of

Doctor of Education

Dissertation: UNDERSTANDING UNITED STATES COLLEGIATE FLIGHT STUDENTS' PERCEPTIONS AND REALITIES OF ANXIETY AND DEPRESSION

Major Field: Applied Educational Studies

Biographical:

Education:

Completed the requirements for the Doctor of Education in Applied Educational Studies at Oklahoma State University, Stillwater, Oklahoma in May, 2023.

Completed the requirements for the Master of Business Administration in Business Administration at Wichita State University, Wichita, Kansas in 2019.

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Experience:

Sales Engineer, Technical Marketing Department: Textron Aviation, Wichita, Kansas: 2021 to Present.

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