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Turbulence in the Mind: A Literature Review of Mental Health in Aviation and Aerospace

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This literature review sought to identify key mental health challenges faced by aviation/aerospace professionals, particularly those from minoritized backgrounds. The review examines the current landscape of mental health in the U.S. as well as the aviation/aerospace industry and finds that mental health conditions have increased drastically. Historically, mental health has been heavily stigmatized, but societal shifts are taking place that encourage more open communication on the topic. In the aviation/aerospace industry, however, the shift is slower, and aviation/aerospace professionals, especially professional pilots, note barriers such as lack of resources and fear of losing their medical certificate, and thus the ability to fly, as reasons they do not seek or receive treatment. This trend is especially concerning for BIPOC aviation/aerospace professionals as BIPOC communities tend to have lower access to resources despite facing compounded hardships. Recommendations for future research include alternative forms of mental health care and studying mental health trends across BIPOC populations. Lastly, this review outlines calls-to-action that are centered around theory, policy and practice. This literature review underscores the importance of modernizing the approach to mental wellness for aviation/aerospace professionals, specifically those working as professional pilots, and increasing access to mental health resources that do not jeopardize their ability to maintain medical certificates while still receiving the support needed to mitigate, manage, and/or overcome their mental health challenges.

Keywords: aviation/aerospace, barriers, mental health, professional pilot, treatment

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Introduction

Mental health is a pervasive issue within the U.S. and has been a topic that many have intentionally not discussed, embraced, or been comfortable with until recently. In other words, it was a "taboo topic" when it should not have been according to Johnson et al. (2024), especially when considering the U.S. leads the world in the percent of people who will have a mental health condition such as a mood disorder over their lifetime (Wu et al. 2016). The recent acknowledgment and discussion stems largely from the COVID-19 pandemic that caused fear, panic, anxiety, and other mental health challenges for individuals who realized they were unable to cope with the "new world" shaped by the pandemic (Johnson et al. 2024). Stigmatization is heightened within the context of aviation/aerospace because mental health is not a topic up for discussion given the culture of fear due to potential job loss, medical revocation, "grounding", etc. Broadly, there is growing concern about the mental health of aviation/aerospace professionals and in particular, for pilots (Hubbard, 2016), air traffic controllers (Johnson et al. 2024), and collegiate aviation students (Albelo & McIntire, 2022; Albelo et al. 2023; Vonasek, 2023). Factors such as stigma (personal and social), stress, fatigue, advanced technology (e.g., cockpit design/interface), and irregular work schedules, make seeking support or resources to address mental health challenges difficult. This results in delayed treatment, increased likelihood for adverse mental health outcomes (Johnson et al. 2024), and contributes to burnout amongst other mental health challenges. The aforementioned are compounded by a lack of and access to resources for these professionals, especially those from minoritized[1] backgrounds (Johnson et al. 2024). These issues pose a risk to individual well-being and operational safety within the aviation/aerospace industry.

For aviation/aerospace professionals and particularly those who identify as Black Americans or are a part of the Black, Indigenous, or a Person of Color (BIPOC) community, the lack of discussion about mental health constitutes a "double taboo" (Johnson et al. 2024) due to a multitude of factors. These factors, such as a *Culture of Fear, Jeopardizing Job Security, Sources of Support (SOS),* and *Societal Acceptance, Awareness, and Access* help explain why and how the mental health of Black aerospace professionals is impacted (Johnson et al. 2024). The aerospace professionals sampled by Johnson and his colleagues were members of the Organization of Black Aerospace Professionals (OBAP), which provided pivotal and contemporary insight into some of the challenges these individuals experienced relative to mental health. Given OBAP's longevity, position, and prominence in the aviation/aerospace industry (OBAP, n.d.), especially as a leader amongst the aviation/aerospace affinity groups and similar nonprofits, the organization's Board of Directors decided to create a Mental Health Task Force (MHTF). The MHTF's mission is to advance the mental health, fitness, and well-being of

[1] The term minoritized is used here rather than "minority" because minority is a term that for many DEI practitioners, places the blame for the oppression on the individual being oppressed rather than the oppressors or historical situations that resulted in the marginalization and oppression. Consequently, the term minoritized was derived to indicate the blame for oppression should not be placed upon the oppressed (Morrison, 2023; Johnson, et al. 2024).

aviation/aerospace professionals with a focus on those from minoritized backgrounds, by fostering collaboration, innovation, advocacy, and establishing resources (OBAP, n.d.).

The MHTF has several core objectives with the most prominent being to: 1. Identify key mental health challenges faced by aviation/aerospace professionals, particularly those from minoritized backgrounds, 2. Identify what aviation/aerospace professionals, especially pilots, need to improve their mental health, and 3. Conduct research and gather knowledge on Black aviation/aerospace professionals relative to mental health. To accomplish the first two, research must be conducted, hence the impetus and motivation underlying this literature review. The review will delve into mental health, mental fitness and wellness, emotional impacts, perceptions and attitudes regarding mental health, and several associated topics within the aviation/aerospace literature, including BIPOC professionals. The purpose of obtaining a wide swath of topics under the umbrella of mental health allows the researchers to conduct an extensive review of the literature to curate a manuscript that can benefit any aviation/aerospace professional. Further, doing so aids in deriving pointed action items that can help organizations like OBAP and the Pilot Mental Health Campaign (PMHC) to fill the gaps that will be elucidated.

The literature review will be comprised of 14 distinct sections that has been drafted by reviewing 79 sources across 53 peer-reviewed journals. It is important to note that this manuscript constitutes a narrative or traditional literature review, which aims to review published literature on a broad topic and does not typically employ a specific methodology (or methods) (Grant & Booth, 2009). As such, this type of review is not systematic nor is it supposed to be since the purpose of a narrative review is to identify trends, gaps, and/or theoretical perspectives within the literature. While this type of review is commonly used in the humanities and social sciences, its use in this STEM context was deemed appropriate given the origin of this literature review and its intent to explore the gaps within aviation/aerospace mental health. The intent was to ascertain a baseline of the extant research that could be compiled into one place for easy digestion by and dissemination to the membership. Therefore, a narrative review was selected as the most appropriate type of review compared to others such as a systematic review, which strives to answer a specific research question using a rigorous method and systematically searches for evidence to address the question (Grant & Booth, 2009).

The first section will discuss the mental health landscape within the U.S. to provide the necessary background to understand what mental health is and how it is defined, provide relevant data on those afflicted with mental health issues, and broadly outline how the topic has been perceived in the context of society. The second section will detail the mental health of those who identify as BIPOC, specifically providing pertinent context about the historical trauma and inequities these individuals have experienced that adversely impacted their mental health. The third section builds upon the second section and specifically delves into the mental health challenges of Black Americans internal and external to aviation/aerospace. The fourth section will elucidate upon the importance of mental health on an individual's overall well-being, their work/job performance and success, and safety of the industry. The fifth section will detail how mental health has been characterized, perceived, and discussed within the aviation/aerospace industry by industry professionals. The sixth section will outline the antiquated approaches that have been used within aerospace medicine by regulatory bodies and medical professionals to assess, evaluate, and make determinations on the mental health of aviation/aerospace professionals.

The seventh section will discuss the reporting behavior(s) or lack thereof, to employers or regulators by professional pilots regarding their mental health status. The eighth section will

expound upon the perception(s) of mental health by two important demographics within the aviation/aerospace industry: 1. Aviation/aerospace professionals and 2. The General Public. The ninth section will detail the purpose and benefit of peer support programs as a viable option to manage mental health challenges within the industry as well as the demonstrated positive impact of social support in akin settings. The tenth section will outline the common barriers aviation/aerospace professionals experience when they seek mental health treatment and support. The eleventh and twelfth sections will list and elucidate the current gaps in the aviation/aerospace literature relative to mental health, and explain the expected contribution(s) of this manuscript to the field/discipline, respectively. The thirteenth section will discuss the recommendations for future research as well as outline the various calls-to-actions that will be centered around theory, policy, and practice. The fourteenth and final section will culminate the manuscript with a robust conclusion that synthesizes the aforementioned literature, reiterates the importance of mental conversations in U.S. society and aviation/aerospace, outlines the progress made and identifies where gaps still exist within the industry, provides insight on where future research efforts should be directed, and succinctly explains the contributions of the manuscript.

Mental Health Landscape in the U.S.

Mental health illnesses or conditions are a common phenomenon amongst most U.S. Americans and around the globe with an estimated one in five U.S. adults living with at least one mental health condition (National Institute of Health [NIH], 2024). For the purposes of this manuscript, mental health is defined as, "The state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community" (World Health Organization [WHO], 2022). In short, mental health entails one's emotional, psychological, and social well-being (Johnson et al. 2024). It is important to note that mental health is more than the mere absence of mental disorders. Broadly, mental health conditions encompass mental disorders and psychosocial disabilities as well as other mental states that impair functionality and/or result in risk or self-harm. Therefore, mental health is important to discuss because it is not only an integral component of health and well-being (WHO, 2022), but it also informs individual and collective abilities to build social connections and relationships with others.

The number of young Americans that experienced mental health challenges or disorders has risen significantly over the past 10-15 years. Specifically, research by the American Psychological Association [APA] (2019) found that more U.S. adolescents in the 2010s versus the mid-2000s shared they experienced a mental health challenge or issue such as major depression, suicidal thoughts, and/or attempted suicide. This trend, however, was not reflected or seen amongst adults aged 26 years and older, signaling a generational shift in mood disorders is the likely culprit for the increasing trend. Adolescents reporting symptoms consistent with major depressions increased 52% between 2005 and 2017, and young adults aged 18 to 25 reported a 63% increase from 2009 and 2017 (APA, 2019). Additionally, there was a 71% increase in young adults reporting psychological distress from 2008 to 2017 and a 47% increase during the same time frame of young adults experiencing suicidal thoughts or tendencies (APA, 2019). These dramatic increases in mental health related conditions over such a short span of time is alarming and researchers believe part of this increase is due to increased use of electronic communication and digital media consumption (e.g., X and TikTok). There is reason to believe, according to APA (2019) that the increased consumption of social and digital media have had a major impact on teens and young adults more so than adults because the social lives of older

adults are more stable than their younger counterparts. Further, these adults are less likely to consume and use digital media, thereby not impacting their mood or sleep habits nearly as much as the younger demographics (APA, 2019). Overall, researchers suggest the sharp incline in mental health challenges, especially after 2011, stems from the sudden cultural changes within U.S. society as opposed to other factors such as genetics or economic uncertainty. This background is pertinent to properly understand the increase in mental health disparities within the U.S. and underscore both the urgency and relevance of the topic.

Despite mental health challenges being common within the U.S., the topic has only recently grown in importance and become something that individuals feel open to discuss publicly or socially (Johnson et al. 2024). To contextualize this, in 2020, 20.78% of adults reported experiencing a mental illness or condition, equating to over 50 million Americans (Mental Health America, 2024). The understanding of this importance is reflected in the increase in individuals who acknowledged they had or experienced a mental health illness. For instance, in 2022, roughly 59.3 million people – a 9.3 million increase – reported they suffered from a mental health illness, accounting for 23.1% of the U.S. adult population. Part of this recent embrace can be linked or attributed to the COVID-19 pandemic, which caused many to be shut off from the outside world and severed social connections and relationships individuals relied on to function. Consequently, mental health challenges increased and remain at heightened levels according to Panchal et al. (2023). Common mental health challenges include anxiety, depression, and isolation as seen with the pandemic (Nealon, 2021). As of 2023, roughly 90% of U.S. adults believed the U.S. was experiencing a mental health crisis, which is a dramatic increase from the 20% of U.S. adults who believed this very same sentiment pre-pandemic (Johnson et al. 2024). Such a low statistic signaled that mental health in the U.S. was an unaddressed topic for many reasons.

The landscape of mental health in the U.S. has been characterized by some as non-permissive (Johnson et al. 2024), full of stigma (Albelo and McIntire, 2022), and ladled with inequity, particularly a lack of access. The aforementioned has negatively impacted many afflicted by mental health issues. According to Stringer (2024) one-third of respondents expressed they could not receive the mental health services they needed due to various barriers. The first barrier to accessing mental health services cited was cost or financial constraints at 80% (Stringer, 2024) and the second was stigma (e.g., shame or embarrassment) at 60% (Stinger, 2024). The overarching lack of access is posited as an equity issue that impacts many in the U.S., especially those who are low-income. Additionally, the shortage of mental health care professionals poses another barrier as 60% of psychologists state they have no capacity to accept new patients (Stringer, 2024). This shortage barrier is further compounded by the lack of representation amongst these mental health providers within organizations and in the U.S. (Johnson et al. 2024). Despite the aforementioned background and barriers outlined, the mental health landscape of the U.S. is terraforming positively albeit in a slower manner, allowing for more open and candid conversations about a sensitive topic with others (e.g., friends, family, and mental health professionals). Consequently, individuals have been more inclined to seek support, help, and/or treatment for their mental health. This is evident based on research by Panchal and Lo (2024) who stated mental health service utilization has increased over time.

In 2022, 23% of U.S. adults reported receiving mental health treatment, denoting a 4% increase from 19% in 2019. Specifically, more U.S. adults are receiving counseling (10% to 13%) between 2019 and 2022 and are taking prescribed medications to manage their mental health conditions from 16% to 19% during the same timeframe (Panchal & Lo, 2024; Terlizzi &

Schiller, 2022). The largest demographic of Americans that were likely to receive mental health treatment and experienced the highest increase in receipt of treatment were young adults aged 18-26. This same age group also experienced the largest percent increase in the share of adults receiving mental health treatment between 2019 and 2022 at 45% followed by older adults aged 27-50 at 29%, and elderly adults aged 65 and above at 1% (Panchal & Lo, 2024; Terlizzi & Schiller, 2022). The increase in treatment receipt by young adults pre- and post-pandemic underscores the change in the U.S. mental health landscape. Prior to the pandemic, young adults with mental health challenges were likely to not receive treatment compared to post-pandemic and researchers attribute this treatment difference to costs, the transition to from pediatric to adult health care, and difficulty accessing mental health support in collegiate environments (Panchal & Lo, 2024). With respect to gender differences, women are nearly two times as likely to report receiving mental health treatment compared to men as 29% of women sought mental health services whereas only 17% of men sought the same services in 2022 (Panchal & Lo, 2024). Although the mental health landscape is shifting towards a more positive direction, the same cannot be said for members of the BIPOC community.

BIPOC Mental Health

BIPOC[2] individuals historically, have experienced disproportionate levels of trauma and displacement that adversely impacted them personally, professionally, and academically. As a result, their ability to thrive in professional and academic environments has been stifled (Johnson, 2023; Mental Health America, n.d.). The mental health of BIPOC individuals is important to discuss because culture, race, and ethnicity play a monumental role in how individuals experience or perceive the world. It also dictates the type(s) of mental health support that may be needed to properly address mental health challenges. The connection to one's culture and community in addition to having a sense of belonging is paramount for an individual's well-being and overall mental health. Research by Mental Health America (n.d.) found that individuals who possess strong communal connections tended to have better mental health outcomes such as lower suicide rates, violence, and feelings of isolation. This is important in combating instances or feelings of isolation and tokenism BIPOC individuals may experience in various spaces (Mental Health America, n.d.; Johnson, 2023; Johnson et al. 2024).

Members of the BIPOC community tend to be exposed to and/or work in emotionally toxic environments, which may result in mental health challenges including, but not limited to: Suicide, depression, stress (Johnson et al. 2024), crime, and overall poor health outcomes (Mental Health America, n.d.). This proves to be problematic when considering that individuals from underserved communities already experience social exclusion and discrimination (Macintyre et al. 2018), which tends to result in compounded vulnerability (Rafferty et al. 2015). Unfortunately, this is exacerbated by the fact that BIPOC communities possess inordinate difficulty accessing mental health care (Johnson et al. 2024; Mental Health American, n.d.). These challenges to accessing healthcare, specifically mental healthcare, are not new and are well-documented for BIPOC individuals. This difficulty is evidenced as only 39% of Black or African American adults, 25% of Asian American adults, and 36% of Hispanic/Latino adults

[2] The term BIPOC and underrepresented groups/persons were used interchangeably in several of the articles examined. In these instances, both terms referenced individuals who belonged to or identified as a racially or ethnically minoritized person (e.g., Black or African-American, Asian, Hispanic/Latino, American Indian or Alaska Native, Native Hawaiian, or Other Pacific Islander).

with mental health challenges were treated, which pales in comparison to the 52% of non-Hispanic White adults (Mental Health America, n.d.). The reason for this overwhelming disparity between BIPOC communities and White Americans is linked to cultural stigma (Johnson et al. 2024), language barriers (Mental Health America, n.d.), and limited access to affordable health care (Johnson et al. 2024; Albelo et al. 2023). The lack of representation amongst mental health providers is another profound reason in accessing care (Johnson et al. 2024; Charlie Health Editorial Team, 2022). This underrepresentation causes BIPOC individuals to feel less inclined to seek help because their mental health provider may not implement culturally competent or sensitive practices and/or be able to understand their feelings due background differential. While BIPOC individuals experience mental health challenges at similar rates as White Americans (Lyra Health, 2023), they are less likely to seek treatment because of the aforementioned reasons.

While reasons for the large disparity in mental health treatment and the resulting impact on BIPOC and non-BIPOC individuals have been explored, a newer avenue of research has emerged recently to garner insight into another vulnerable demographic: BIPOC students. Specifically, researchers have examined the mental health challenges experienced by BIPOC students pursuing aviation degrees. A study by Albelo et al. (2023) outlined the intricacies of mental health within BIPOC communities and connected them to a slew of factors such as fiscal constraints, environmental, and social support. These factors often had a negative impact on the mental health of the aviation students whereas the social support, if provided correctly, had a positive impact. In the same study, Albelo and his colleagues elucidated the impact of discrimination on the mental health of underrepresented students, specifically highlighting those within the LGBTQ+ community were more likely to experience bouts of depression and anxiety (Albelo et al. 2023). Consequently, students belonging to this underrepresented group are more likely to experience declining mental health, indicating they face challenges accessing appropriate and suitable mental healthcare. Similar to the BIPOC and non-BIPOC adults, BIPOC students are less likely than White or non-BIPOC students to seek mental health support or treatment (Lipson et al. 2022). Research by Hoffman et al. (2024b) identified six research topical priorities to support the safety, efficiency, and overall health with an emphasis on mental health for the betterment of aviation safety sensitive personnel (SSP). Of the six priorities, members of the research committee involved in the sample ranked “Special Considerations and Underrepresented Populations (URPs)) as the sixth or lowest of the priorities (Hoffman et al. 2024b). Such a ranking underscores the need for a focus on BIPOC mental health, especially considering the fact that aside from the study conducted by Johnson et al. (2024), there is little research on Black and BIPOC aviation/aerospace professionals despite this population possessing inordinate difficulty accessing resources to manage their mental health.

Black Mental Health

The literature seems to confirm the mental health of the BIPOC community has been largely negative because of historic inequities (Johnson et al. 2024; Mental Health America, 2024), barriers to access (Johnson et al. 2024), and stigma. For Black or African-Americans in particular, this narrative worsens. Overall, Black adults in the U.S. are more likely to experience feelings of sadness, hopelessness, and worthlessness than their White adult counterparts. Additionally, Black adults tend to possess strong beliefs related to stigma that results in them being less inclined to seek support for their mental health despite the fact they are 20% more likely to experience serious mental health problems (Johnson et al. 2024; Vance, 2019).

According to Lyra Health (2023) 43% of Black Americans try to deal with mental health challenges on their own rather than seeing a therapist or receiving another form of mental health support compared to only 35% White Americans in the U.S. This adverse attitude towards seeking help for mental health issues is a commonality amongst Black Americans in the U.S., but is particularly prevalent amongst Black men. Such a poor attitude amongst Black men stems from the adverse stigma surrounding mental health, which is underpinned by numerous factors. These factors typically include a lack of confidence in the medical system because of historical abuses of trust (e.g., the Tuskegee Syphilis Study) (Johnson et al. 2024), a lack of culturally competent or sensitive medical providers (Lyra Health, 2023; Johnson et al. 2024), fiscal constraints (Albelo et al. 2023), and bouts of medical racism (Vance, 2019).

Due to the aforementioned factors, mental health has largely been a topic many are unwilling to discuss within the Black community (Johnson et al. 2024), especially pre-pandemic. Such a mentality towards mental health amongst Black adults in the U.S. is not a new phenomenon, but due to the increase in mental health services utilization within U.S. society and more research being published about it, the topic is receiving more attention from those within the community and by healthcare providers. According to Johnson et al. (2024) one reason for this mentality is a lack of social acceptance, awareness, and access within the Black community regarding mental health. As children and adolescents, mental health was not a topic for discussion within the homes of Black Americans because it was not something generally accepted or embraced within U.S. society at-large. This resulted in a lack of awareness about mental health, associated conditions, and potential resources one could utilize to manage mental health conditions as they became teenagers and young adults. Consequently, once they reached adulthood and now had the autonomy to seek help, they were not cognizant of the resources they could access nor how to access them (Johnson et al. 2024). Subsequently, Black Americans had to suffer in silence because they did not know how to obtain help. The stigma around mental health only worsened this issue as roughly 63% of individuals within the Black community believed that having or seeking treatment for mental health issues was a sign of personal weakness (National Alliance on Mental Illness [NAMI], 2020). Such a belief is not true, but unfortunately, is a deep-rooted and strong belief held by many Black Americans. This belief is exacerbated by socioeconomic factors that further mitigate access to mental health support for Black Americans such as a lack of health insurance. This lack of coverage negatively impacts nearly 11.5% of Black adults (Charlie Health Editorial Team, 2022) and with the average cost per session being $100-$200 without insurance (Woods, 2023), having health insurance is necessary to obtain treatment.

These various barriers, adverse mentality towards mental health, and historic trauma and abuse is all underpinned by social inequities towards one demographic. This is concerning and problematic because increased social inequality has been linked to a higher frequency of mental health challenges and disorders. Despite this, many Black Americans still opt to let their mental health go untreated. It has been suggested that members of the Black community may be more inclined and willing to seek mental health treatment if their healthcare provider was representative of them with respect to race and/or gender (Alang, 2019). The lack of representation amongst medical providers and particularly mental health professionals is and has posed a tantamount problem for Black individuals who seek help. The reasons for this stem from negative past experience(s) with medical professionals. According to Alang (2019) Black individuals with college education were more likely to report stigma and a minimization of their symptoms as reasons for unmet needs when seeking help.

Additionally, the fear of discrimination based on race and on mental illness was also shared, underscoring the importance of anti-racism education and culturally competent/sensitive healthcare providers (Alang, 2019; Lyra Health, 2023; Johnson et al. 2024). In a similar vein of representation, members of the Black community are less frequently included in mental health research and resources (e.g., books and pamphlets) according to Charlie Health Editorial Team (2022). This signals that these individuals do not see themselves nor their issues represented in medical-based mediums and documents. In addition to the lack of representation, historical mistrust in medical systems among Black Americans as evidenced by Vance (2019) is well-documented and may contribute to their reluctance to seek treatment. This phenomenon is further elucidated within the *Cultural Mistrust* section. Thus, many Black Americans know the importance of mental health yet rather suffer on their own or cope the best way they know how than to put their trust in a healthcare system that has discriminated against them.

Mental Health Importance

The importance of mental health has been underscored by many in light of the pandemic with several aviation-centric entities and organizations (including commercial airlines), social media influencers and socialites, and researchers positing that it is an element of well-being that should be taken seriously. One such organization is the Pilot Mental Health Campaign (PMHC), which as their website states, "Is the only advocacy group dedicated to creating a modern aeromedical system that works for both pilots and passengers" (PMHC, n.d.). One organization alone is not sufficient to spread awareness or corral support to rectify such a pivotal issue, and the platform they are using to communicate the salience of their message is resonating with many in a variety of work environments. Mental health is tied to overall health and well-being, and given the fact that the average person spends most of their day at work, it has a direct impact on one's work with respect to outcomes, performance, and safety. Research by Hilton and Whiteford (2010) found that moderate and high psychological distress increased the odds ratio for workplace accidents and work failures while decreasing the odds ratio of workplace success at similar levels. Given the limited room for error in aviation/aerospace positions, understanding the importance of mental health and taking appropriate steps to manage it is critical because lapses in safety can result in catastrophic damage and loss of life.

Some may not fully understand the intersectionality of mental health with well-being, safety, satisfaction, and other concepts because it is pervasive and until recently, was not a topic many felt comfortable discussing openly with others (Panchal et al. 2023; Jamshaid et al. 2023; Johnson et al. 2024). This pervasiveness and its implications were detailed thoroughly by Plana-Ripoll et al. (2010) in a study that posited comorbidity within mental disorders is a common phenomenon for individuals to experience and that the risks persists over time, elevating their potential for developing another mental health disorder. This supports and accentuates research by Hilton and Whiteford (2010) who determined that as the number of health conditions increased so did the odds ratio for an accident whereas high psychological distress contributed to increase workplace safety issues. These risks differ based upon one's sex, age, lifestyle, and other factors, but it is plausible to state that individuals working in high-stress, high-stake professions (e.g., law enforcement, healthcare, and aviation/aerospace) are more likely to experience mental health issues (Johnson et al. 2024; Santre, 2024; Hassan, 2023; National Institute for Occupational Safety and Health [NIOSH], 2024). The literature accentuates the notion that thinking about mental health is important, especially in the workplace because of its direct impact on an employee's probability to have an accident or incident, which is something

that cannot be afforded in certain fields such as aviation. Therefore, it is important to proactively identify, address, and mitigate stressors that can cause or exacerbate mental health challenges. There are several aviation/aerospace entities that are actively engaged in providing mental health services, resources, and support for their employees as a means to address and mitigate workplace stressors. Prominent examples include United Airlines, American Airlines and the Air Lines Pilots Association, International (ALPA).

United Airlines

United Airlines offers its employees a benefits package that encompasses numerous resources aimed at supporting employees' mental wellness, including but not limited to: Emotional support, counseling services, and behavioral health professionals (Souza, 2022). To improve the mental wellness element of their benefits package, United recently formed a partnership with Lyra, a health and wellness company (United, n.d.). The new partnership provides United employees with comprehensive mental health and Employee Assistance Programs (EAP) services in addition to access to 24/7 access to self-care tools, no-cost therapy, and mental health coaching sessions for the employee and their family. This includes access to a care giver for individualized treatment coordination to navigate one's mental health journey and specialized providers for adolescents so they can receive age-appropriate and compassionate care (United, n.d.). Such a robust and tailored mental health benefits package responds to some of calls-to-action or recommendations posited by scholars (Johnson et al. 2024; Hoffman et al. 2024a; Hoffman et al. 2024b) with respect to changes needed to encourage help seeking behaviors amongst aviation/aerospace professionals while reducing commonly cited help seeking deterrents.

American Airlines

American Airlines is another aviation/aerospace entity that is actively working to support its employees' physical, financial, and emotional/mental health through the provision of mental health services and programs. According to American Airlines (n.d.), the airline offers its employees free and confidential counseling services through the EAP in addition to on-site counselors at various American airport hubs. A unique offering made by American Airlines is its peer support program referred to as Project Wingman (American Airlines, 2020). This program was created through a joint venture between American Airlines Flight Department and Allied Pilots Association in response to the need of specialized support mechanisms to support airline employees, especially professional pilots. Consequently, the peer-to-peer support program was created as a means to establish a safe, confidential space for employees and in particular, pilots, to speak with fellow pilots candidly and without a fear of repercussion (American Airlines, 2020). The program has over 40 pilot peer assist volunteers who provide socioemotional support and are trained to conduct crisis triage. To become a volunteer, individuals must complete 40 hours of specialized intensive training. Due to the number of volunteers running the program and training they undergo, the program is recognized as the industry's leading peer support program (American Airlines, 2020) and sets the standard for what a peer support program within the industry could be for others seeking to model it. When the unfortunate accident occurred at the Ronald Raegan airport in January 2025, American Airlines offered free counseling to employees and their families across its network (Woodward, 2025), underscoring their commitment to mental health support and operationalizing their peer support program.

Air Line Pilots Association, International (ALPA)

ALPA is the world's largest airline pilot union, representing and advocating for more than 75,000 pilots at 43 airlines within the U.S. and Canada. The organization provides three main services to its members: 1. Airline safety, security, pilot assistance, and jump seat, 2. Representation, and 3. Advocacy (ALPA, n.d.). Mental health support is housed within the airline safety and pilot assistance service category with a prominent resource being a guidance page on their website. The guidance page encourages individuals to utilize the "IMSAFE" checklist, details potential options for support such as FMLA and EAPs, individuals can request or use that are provided by their employer, and lists a slew of external mental health resources for ease of access. Additionally, ALPA has its own peer support program; this program is known as the Pilot Peer Support (PPS) program, which is a confidential peer network members can access for support (Pickett, n.d.). Similar to American Airlines' Project Wingman program, the PPS connects ALPA members with trained pilot peers so they can discuss personal or professional challenges that may be adversely impacting their mental health. The pilot peers in the program offer a safe, confidential, and judgement free environment so individuals feel comfortable seeking help. The creation of the aforementioned resources and peer support programs help convey the importance of mental health within the industry and showcases some of the action prominent aviation/aerospace entities have taken to improve mental health care.

Mental Health in Aviation/Aerospace

The salience of mental health cannot be overstated within the field; however, this importance has not always permeated or been widely embraced within the aviation/aerospace industry. According to Wu et al. (2016) the Germanwings Flight 9525 crash was one prominent accident that highlighted aviation mental health and specifically brought airline pilot mental health to the forefront of the industry as 350 million people suffer from depression globally. This lack of permeation or embrace can be explained by the immense "taboo" that has surrounded mental health within the industry for years (Johnson et al. 2024). While mental health has been interest area within society and the focal point of some studies, particularly within the social sciences (Clarke et al. 2024), the study of mental health within aviation/aerospace has not necessarily follow a similar trend. Despite concerns and challenges surrounding mental health care or treatment being known by those in the industry, it was not until 2021 when it was taken more seriously by industry professionals, industry leadership, and regulatory bodies.

Unfortunately, the impetus of this new embrace of mental health was precipitated by the tragic and untimely passing of two collegiate aviation flight students: one in 2021 and the other in 2024. In 2021, a student at the University of North Dakota (UND) committed suicide via plane crash (University of North Dakota Alumni Association, n.d.). This devastating loss cast a spotlight on mental health within the industry. Specifically, it sparked a movement, led by the student's parents and staunch supporters of mental health, that aimed to spread awareness of mental healthcare issues within aviation/aerospace. The goal was to facilitate real change at the regulatory level and in the months following the UND incident, the first ever aviation mental health symposium was planned and hosted at UND (University of North Dakota, n.d.). The symposium, now an annual event, strived to provide awareness, increase support, and destigmatize mental health in the industry in order to shift the topic from being a taboo. This constituted an excellent first step in redressing what has been a lingering and notably pervasive issue for the industry with a significant amount of reason being conducted in the past decade

(Clarke et al. 2024; Hoffman et al. 2024a; Hoffman et al. 2024b; Johnson, 2024; Winter et al. 2017; Winter & Rice, 2015).

Recent aviation/aerospace scholars have centered their research efforts on collegiate aviation given the aforementioned tragedies. The findings from those studies is paramount and benefits the industry at large since collegiate aviation programs essentially funnel new professionals into the industry (Johnson, 2023). The uptick in mental health-related research has helped promote the conversation about its importance, highlight disparities with medical care, outline barriers individuals experience, elucidate certain challenges individuals from underrepresented demographics experience, and corral support for these groups. There has been one researcher, namely Albelo and his colleagues, who have contributed to the collegiate aviation mental health literature to combat the taboo nature of the topic within the past five years. There are four studies in particular that accomplish this. The first study examined mental health challenges amongst underrepresented collegiate aviation students (Albelo et al. 2023). In this study, Albelo and colleagues detailed the intersectional complexities of mental health in underrepresented communities. Some of these complexities included financial constraints and environmental factors (Albelo et al. 2023). In the same study, the issue of discrimination and its impact on the mental health of underrepresented students was addressed with those belonging to the LGBTQ+ community suffering the most and as a result, were more likely to experience depression and anxiety (Albelo et al. 2023). Furthermore, underrepresented students were more likely to have declining mental health and difficulty obtaining consistent care.

The second study examined the impact of DEI and its integration in aviation classrooms through a unique methodological approach deemed the "4Ts" – Talking, Teaching, Tools, and Taking Care (Albelo et al. 2022). The authors determined the integration of DEI via the 4T method placed aviation faculty in a more advantageous position to help their students cope with and address mental health challenges. The third research endeavor by Albelo and team was predicated upon a previous study they conducted, which sought to understand the perceptions of mental health amongst underrepresented minority students in an undergraduate collegiate aviation/aerospace program (Albelo et al. 2023). In this study, the authors concluded there were several key factors or elements underrepresented students needed to maintain their mental health. These included the promotion of a healthy (learning) environment and encouragement to pursue education, setting realistic goals, and learning about the resources available to manage their mental health (Albelo et al. 2023).

The fourth study aimed to understand the mental health needs of minority aviation students. The authors determined aviation students believed there was a negative stigma surrounding mental health (Albelo and McIntire, 2023), which supports the findings of other scholars exploring similar topics (Johnson et al. 2024; Wu et al. 2016; Pederson, 2023). This stigma prevented the students from seeking help and because of it, they were also more inclined to refrain from disclosing mental health concerns to others. It was noted that social support, psychological distress, and psychological well-being were some of the most profound mental health challenges these aviation students experienced (Albelo & McIntire, 2022). To counteract these challenges the authors recommended collegiate aviation educators create a sense of belonging through DEI practices, supporting earlier studies by Albelo et al. (2022), be intentional with inclusive and culturally competent language (Alang, 2019; Lyra Health, 2023; Johnson et al. 2024), and be more proactive with the promotion of mental health well-being across campus.

While a large concentration of recent mental health research has centered collegiate aviation, which is warranted given the aviation student suicides in 2021 and 2024 (Johnson et al.

2024) and the rise of mental health issues amongst college students post-pandemic (John Wiley and Sons, 2024), there has been contemporary research conducted on the mental health of industry professionals. A study by Johnson et al. (2024) explored the experiences of Black aerospace professionals relative to mental health to understand how they characterized their experiences, what their needs were, and what factors contributed to or impacted their mental health. The study found that most of these professionals characterized their mental health experiences as negative because of several factors such as working in an unsupportive work environment, lacking representative sources of support, and living in a constant state of fear or worry due to the culture of fear imposed by certain regulatory bodies.

Additionally, Johnson and his colleagues asserted these professionals needed three things: 1. To know that their job, specifically those in professional pilot positions, will not be terminated if they opt to seek mental health support or treatment; 2. To know they will not be judged negatively by their peers for discussing their mental health challenges and 3. A safe space in the industry to express and just be themselves (2024). While the research specifically explored the experiences of Black aerospace professionals, it is not far-fetched to believe that some of the aforementioned needs are generalizable and transferable to non-Black industry professionals since mental health is not bound race or gender. In short, mental health in aviation/aerospace, has overwhelmingly been perceived and experienced in a negative manner because of stigma (Wu et al. 2016; Johnson et al. 2024; Pederson, 2023), a fear-mongering culture, steep consequences such as losing a medical certificate (Hubbard, 2016), a lack of access and support (Johnson et al. 2024; Coombs et al. 2021), poor social evaluations from others (Sabik et al. 2019) as suggested by the literature. However, what appears to be certain is that industry and government leadership need to create a more permissive environment where mental health can be less of a taboo topic and be more of an open discussion without social persecution or professional sabotage.

There is a potential for this type of environment to be created with the recommendations put forth by the FAA Mental Health Aviation Rulemaking Committee (ARC) (FAA, 2024). This ARC alongside the momentum, efforts, and support from organizations such as PMHC and OBAP, possess the potential to alter the current, negative perception of mental health amongst the masses to a more positive one and demonstrate what has been known by those researching the topic. That is, when access is not an issue, the work environment is supportive, leadership provides encouragement, and support is available, mental health challenges are addressed effectively, efficiently, and mitigated as contended by Johnson et al. (2024). This opposes the long-standing rhetoric that aviation/aerospace professionals are a liability, flight risk, and/or unfit for duty merely because they experience mental health distress. Such opposition and work is necessary to innovate the antiquated approaches many have taken or hold as it relates to aerospace medicine.

Antiquated Approaches to Aviation/Aerospace Medicine

The antiquated approaches used by U.S. aviation regulators to screen, monitor, track, diagnose, and treat aviation/aerospace professionals possess flaws and have proven to be problematic for those subjected to them as contended by scholars (Hoffman et al. 2024a). The outdated approaches have resulted in unintended consequences, some of which include healthcare avoidance, screening imprecision, and a lack of trust/confidence in the system particularly as it relates to mental health care/treatment (Hoffman et al. 2024a; Johnson et al. 2024). Due to these unintended consequences, researchers assert that an alternative approach should be derived to address the aforementioned factors while still maintaining a high level of

safety. Research by Hoffman et al. (2024a) proposed the simultaneous use of multiple methods to accomplish this; their measured approach minimizes the negative consequences of healthcare avoidance and screening imprecision. This provides a newer, more innovative method to examine aviation professionals. The current approach employed by regulators consists of having commercial airline pilots be evaluated every six or 12 months by a FAA Aviation Medical Examiner (AME). The AME screens for mental health conditions and applies algorithmic medical certification guidance provided by the FAA to make determinations. As stated by Hoffman et al. (2024a), there are two distinct issues with the current approach, namely pilot mental healthcare avoidance and screening inaccuracy. The current approach, particularly as it relates to assessing pilot mental health, utilized by regulators is characterized as the "Legal Model". While regulators should be "promoting good" by encouraging the regulated (e.g., professional pilots) to proactively mitigate risks (e.g., incentivizing participation in a mental wellness program) (Hoffman et al. 2024a), the model centers on controlling the "bad".

The "bad" entail the identification of specific risks or hazards in the system and removing or mitigating them (Hoffman et al. 2024a), which has proven to be a problematic and contentious process for many professional aviators, especially those who have lost their medical certificates. Such a process denotes that an alternate approach be created that can: 1. Identify and control the broad hazard categories (e.g., cognitive dysfunction and risk of harmful acts); 2. Ensure commercial airline pilots with mental health conditions are fit to fly, and 3. Address pilot mental healthcare avoidance and screening inaccuracies. To accomplish this, Hoffman et al. (2024a) suggested the alternative approach, namely a Self-Regulation model, be used in tandem with a Prescriptive model. The duality of this model provides an improved yet measured approach to pilot mental health and aerospace medicine in totality. This model posits that airlines employ a combination of "promote good", meaning encourage mental wellness program participation and advocate for peer support programs, as well as "control bad" via additional training or oversight in conjunction with internal assessment(s) to verify risks are controlled to an acceptable level (Hoffman et al. 2024a). The use of the aforementioned approach strives to lower healthcare avoidance and decrease false positives during screenings. It provides a stark contrast to the Legal Model approach used currently by U.S. regulators, which may result in more unintended negative consequences that outweigh potential benefits, and is rather ineffective at promoting the good while controlling the bad without excessive punitive measures placed on professional pilots. While it is recognized that the proposed model by Hoffman and colleagues is only conceptual, it provides a compelling case for further examination because of its viability as a potential framework within aerospace medicine.

The antiquated approach to aviation/aerospace medicine is compounded by the lack of mental health research priorities extant within the industry (Hoffman et al. 2024b). This signals a greater lack of awareness of the gravitas of the issue by industry leadership, policy makers, and other stakeholders. To counteract this, researchers have conducted studies aimed at generating a list of priorities for the industry as means to focus efforts with intentionality. Specifically, Hoffman et al. (2024b) conducted research to generate a list of aviation Safety Sensitive Personnel (SSPs) mental health priorities. The International Civil Aviation Organization (ICAO) defined SSPs[3] as, "Person who might endanger aviation safety if they perform their duties and functions improperly." (ICAO, 1995). The purpose of their research was to derive a list that

[3] By ICAO's definition, SSPs includes technical air crew, cabin crew, maintenance personnel, air traffic controllers, and security screeners (ICAO, 1995).

would aid aviation stakeholders to optimize and prioritize SSP mental health states, understand the role of various mental health states on performance, and identify and mitigate threats to aviation/aerospace safety.

The rationale underpinning this is that SSP mental health impacts both the individual, their performance, and the safety of the aviation/aerospace system because of its pervasiveness as adduced by Johnson et al. (2024), Panchal et al. (2023), Jamshaid et al. (2023), and Plana-Ripoll et al. (2019). In the study, Hoffman et al. (2024b) identified six research priorities, consisting of the following topical areas: 1. Safety Performance; 2. Mental Health Initiatives, Education, and Peer Support Programs; 3. Clinical Care, Pharmacology, and Return to Duty; 4. Epidemiology and Natural History; 5. Screening, Monitoring, and Emerging Technology, and 6. Special Considerations and Underrepresented Populations. Of note, researchers contended the relationship between mental health, performance, and safety in SSPs is one that should be explored first and intentionally given the tantamount nature of mental health. The importance of mental health initiatives, education, and peer support programs was listed as the second priority as mental health programming (Johnson et al. 2025) and peer support programs (Winter & Rice, 2015; Johnson, 2024; University of North Dakota Alumni Association, n.d.) have been found to be beneficial in managing mental health challenges prior to them evolving into worse issues.

The importance of having intentional and dedicated research priorities makes it easier to identify, mitigate, and deter potential safety threats while conveying a more proactive approach to nuanced safety items such as mental health (Hoffman et al. 2024a; Hoffman et al. 2024b; Johnson et al. 2024). However, it is vital these topics be explored in a manner that does not result in unintended harm to aviation/aerospace SSPs. As such, there is a glaring need to update the approach used to medically screen aviation/aerospace professionals for both their mental and physical health, and to obtain a concurrence on the research priorities for these professionals so the industry can implement holistic, viable safeguards that will protect all vested parties (Hoffman et al. 2024a; Hoffman et al. 2024b). Consequently, aviation/aerospace professionals, especially those in professional pilot positions, may be more inclined and willing to voluntarily report when they are unwell, not “fit to fly”, and seek mental health treatment.

Pilot Reporting of Mental Health

The voluntary reporting by a professional pilot to their organizational leadership or a regulatory body of any status other than “fit to fly” has historically, been the norm within the industry. This is largely because of the taboo, fear or anxiety, and uncertainty surrounding mental health within the industry (Johnson et al. 2024). There have been countless situations where professional pilots who experienced mental health issues shared these challenges with others (e.g., peers/family and mental health professionals) and had their careers truncated (Hubbard, 2016). Due to the culture of fear (Johnson et al. 2024), stigma (Winter and Rice, 2015; Wu et al. 2016; Pederson, 2023; Johnson et al. 2024), and overarching U.S. societal taboo relative to mental health (Fershtman et al. 2009; McLean Hospital, 2024), fewer professional pilots are self-reporting instances of mental health issues because they are fearful of the potential career ramifications. Unfortunately, professional pilots and particularly, those working for commercial airlines, have been conditioned to refrain from sharing any mental health distress or psychological issues because of the innate fear of losing their wings. The literature suggests that the gravity and seriousness of stigma underpinning this conditioning is akin to bullying since pilots are inclined to protect and prioritize their jobs over safety (Hubbard, 2016). This narrative and reporting trends worsen when examining the reporting tendencies of Black aerospace

professionals, specifically pilots. Research by Johnson et al. (2024) found that Black aerospace professionals encapsulated their experience(s) with mental health as largely negative because of a fear of reprisal or termination and unsupportive work environments. Such a mentality directly contradicts the mission of the FAA and that of many aviation/aerospace professionals, but they essentially have no choice due to the antiquated approaches, barriers to care, and other factors that make it difficult to seek genuine mental health support.

The lack of reporting is not limited to just the commercial airline flight deck; it transcends the professional sectors and has been seen amongst/within collegiate aviation environments as propounded by the literature. This was demonstrated in research by (Pitts and Faulconer, 2023) who conducted an anonymous online survey and found that 56.6% of collegiate pilots met the criterion for some degree of depression and 13.8% reported some degree of self-injurious or suicidal ideation within the past two weeks. These statistics alone are concerning, especially when considering 67.7% of this same sample expressed concerns about seeking mental health treatment because of the potential adverse impact on their medical certificate and 29.3% admitted to withholding mental health issues from AMEs for the same reason (Pitts & Faulconer, 2023). This trend was supported by another study conducted by Hoffman et al. (2019) who surveyed participants and found that 78.63% of pilots reported feeling worried about seeking medical care due to concern for their aviation career or hobby. These statistics are significant and alarming. They underscore the reluctance to and lack of reporting at the collegiate level by future professionals, specifically pilots, who will soon be shepherded into the industry through a variety of pipelines. More importantly, the fact collegiate aviators have already learned and are practicing this behavior highlights the adverse sub-culture of non-reporting that exists and accentuates the need to remedy it. It is important to note that this non-reporting culture is not only a U.S. issue; mental health is not geographically limited, and aviation is global. This worldwide intersectionality between aviation/aerospace and mental health was elucidated by Hoffman et al. (2023) who identified that 56% of U.S. pilots report a history of healthcare avoidance behavior compared to 55% of Canadian pilots. This behavior is highly prevalent in pilots from both countries due to a fear of loss of flying status. The reporting culture that exists within the U.S. and internationally, especially amongst those in professional pilot positions, sends a strong message about the overall perception of mental health within the industry.

Perceptions on Mental Health

The literature purports the perception of mental health within aviation/aerospace tends to be more negative and that signals a drastic change is needed to create a more permissive environment (Johnson et al. 2024). A more permissive environment may be key to altering professionals' perception(s) to be more positive. Consequently, improvements in pilot reporting and decreases in healthcare avoidance behaviors, industry professional mental health/wellness, and aviation safety may occur organically. Until then, it is important to ascertain a general baseline of mental health amongst these industry professionals, differences in perceptions between male and female professionals as well as the perception of the general public, and expound upon the reasons why both industry professionals and the general public possess their respective specific perceptions about mental health.

Aviation/Aerospace Professionals

Due to the profound stigma surrounding mental health in aviation/aerospace, there was relatively little known about the mental health of professional airline pilots, especially female

airline pilots, until recently. Such a gap was noted by Wu et al. (2016) and their study aimed to address it while also deriving a general baseline of mental health for airline pilots in totality. Wu et al. (2016) found that in the context of reporting depression, female pilots reported more days with poor mental health and having more diagnosed depression than male pilots. Additionally, the researchers found that the higher prevalence of depression occurred among victims of frequent sexual or verbal harassment, thereby providing further evidence of its existence amongst airline pilots. This prevalence of such a common mental health challenge is concerning and research by Johnson et al. (2024) found that being in an unsupportive work environment amongst other factors negatively impacted the mental health of aerospace professionals. Therefore, there is solid evidence that supports the findings by Wu and colleagues relative to the impact of a negative or toxic work culture ladled with harassment stemming from race and/or gender. Of interest, Wu et al. (2016) found that 75 pilots in their survey reported having thoughts of being better off dead or committing self-harm in the two weeks preceding their survey participation. While this figure was the most current measure of prevalent suicidal thoughts among airline pilots in 2016 and is likely outdated at the time of this manuscript, the fact such a thought was shared by that many professionals warrants concern. It also underscores the fact that there are hundreds of pilots flying currently that are managing mental health conditions and depressive symptoms, and are more than likely doing some with professional treatment because of the negative ramifications on their career (Wu et al. 2016; Johnson et. al 2024; Hoffman et al. 2024a). Due to this, it has been recommended by several scholars (Wu et al. 2016; Hoffman et al. 2024a) that commercial airlines increase support for preventative mental health treatment. Doing so may aid in improving mental health screening, evaluation, and more importantly, encourage these professionals to self-report and willingly seek help rather than suppressing it.

Several scholars examining aviation/aerospace mental health and akin fields have posited professional pilots have tendencies to engage in healthcare avoidance behavior(s) (Raus, 2023; Hoffman et al. 2023). This signifies a negative perception of mental health in general. Given what is known from studies that have obtained a baseline of pilot mental health, this type of behavior is not surprising and could be considered a byproduct of the non-permissive culture. An interesting definition related to healthcare avoidance in the literature is “Healthcare hesitance”, which is defined as, “A delay or refusal to seek needed healthcare services” (Raus, 2023). Any aviation/aerospace industry professional can engage in healthcare hesitation, but it appears to be more common amongst professional pilots, which eventually evolves into healthcare avoidance. Aside from jeopardizing their employment, there are several reasons why professional pilots may engage in healthcare avoidance. These include personality, financial considerations, and mistrust of regulatory bodies. Research by Raus (2023) delves into each of these elements and their impact on professionals. Professional pilots tend to possess a resilient and confident mindset; this contributes to an inflated ego and pride may prevent them from seeking healthcare. Due to flying being a prominent part of their identity, losing the ability to fly combined with the egotistical mindset are both factors that make them inclined to avoid healthcare (Raus, 2023).

The cost of healthcare and insurance within the U.S. is a commonly cited reasons as to why aviation/aerospace professionals do not seek mental health treatment (Johnson et al. 2024; Hoffman et al. 2024a; Raus, 2023). Even though these professionals tend to make a modest amount of money, overcoming the typical financial facet of the access issue, the cost of evaluations and treatment that is required for disqualifying conditions coupled with the possibility of lost wages serve as additional deterrents for seeking healthcare (Raus, 2023). The lack of trust and confidence in the medical process as well as U.S. regulatory bodies are

additional factors contributing to avoidance behaviors. It is known that professional pilots must disclose medical visits, but it is not clear which mental health services qualify as "treatment" and thereby, should be reported. This ambiguity is problematic in and of itself, and with professionals already possessing a negative perception about mental health services, they tend to avoid them altogether as a means to not report them (Raus, 2023). What is compelling however, is that professional pilots shared they would willingly seek mental healthcare if it were provided in alternative ways and there were less punitive measures. Specifically, 75% of pilots who reported at least one avoidance behavior stated they would utilize sanctioned intervention if available (Hoffman, 2021) and up to 60% reported they were open to using an anonymous hotline to obtain mental health assistance (Daku, 2021). The aforementioned underscores the want that these professionals have to get help and manage their mental health if viable options were available. However, little to no options similar to the proposed alternatives exist or are FAA-approved, placing these professionals in a precarious position to protect themselves and their certificates. Such a position has the potential to bear negative implications for those reliant on these professionals for travel, namely the general public.

General Public

The perception of mental health from the perspective of aviation/aerospace professionals, specifically those in professional pilots, is well-known. What is lesser known is the general public's perception on aviation mental health as it relates to how they view or perceive the mental and emotional health of these professionals. A study by Winter and Rice (2015) explores this perspective to determine how the level of pilot sociability would influence their views toward the mental health of their pilot. In the study they found that when a pilot was presented as being unsociable, participants rated the pilot as being more likely to have a mental illness than when a pilot was presented as sociable. Based on this, Winter and Rice stated that a reason participants may deem their pilot unsociable v. sociable stems from the stigma surrounding mental health. According to Winter and Rice (2015), stigmas can have strongly influence one's opinions formed on particular topics, especially when portrayed in the media, and it is likely this may have influenced some of the participants in the study to deem pilots as unsociable and being afflicted with mental health when in actuality, they may have not been. When this study was conducted in 2015, there was a spike in media attention surrounding medical qualifications and lack of mental health screenings for professional pilots.

This increase in media coverage likely stemmed from the Germanwings Flight 9525 accident, in which it was concluded that the First Officer intentionally crashed the airplane after locking the captain out of the cockpit when he went to the restroom (Wu et al. 2016). Although this unfortunate accident occurred in France, the news shook the general public and information shared from the investigation presumably, diminished their confidence and trust in those piloting the aircraft. The accident also shifted their perception of aviation mental health and of aviation/aerospace professionals who may be dealing with such issues. Being a pilot has always been associated with a level of prestige and high social status due to the great responsibility they hold as flight commanders (Winter & Rice, 2015). As such, it is not farfetched to understand why the general public's perception of individuals in these positions may shift in light of such traumatic and devastating news, potentially impacting their willingness to fly commercially long-term. This shift in mentality was found in research by Winter et al. (2017) who conducted a longitudinal study in the weeks following the aforementioned accident on participants willingness to fly when their pilot was taking various medications, namely fluoxetine, loratadine,

ibuprofen, or clonidine. Winter and colleagues reported there was a notable decrease in participants' willingness to fly if their pilot was taking fluoxetine (an antidepressant) immediately after the accident whereas there was no change in willingness of other medications.

Given the traumatic and unfortunate tragedy of the Germanwings accident in 2016, skepticism and skewed perception of aviation mental health, specifically negative views towards commercial airline pilots that are afflicted by mental health issues, by the general public is expected. The negative views held by the general public towards pilots appeared to have been only temporary according to Winter et al. (2017) wo found that negative perceptions spiked three weeks after the aviation incident and 12-weeks post-accident, from which thereafter public perceptions returned to pre-accident levels. This timeline could have been shortened as suggested by Winter et al. (2017) if proper outreach was conducted by a regulatory body such as the FAA to the general public to ease the angst, address the accident, hear their concerns, and field questions via town hall or press conference. Further, some may argue that it was an opportune platform for regulatory bodies to elucidate the safety benefits of treating pilot depression and market them correctly, potentially reducing some of the initial shock and negative reactions stemming from the accident. The waning negative public perception in the weeks after the Germanwings accident is an interesting finding (Winter et al. 2017) and points to a silver lining with respect to the ability to regain the public's confidence in commercial air travel in addition to their confidence and comfortability with professional pilots who possess mental health disorders.

While much of the public's adverse perception about individuals impacted by mental health issue has been underpinned by the overwhelming stigma surrounding it (Lyra Health, 2023; Johnson et al. 2024; Winter and Rice, 2015), recent trends indicate that perception of the public has improved relative to the embrace of mental health. According to Pescosolido et al. (2021) the current trends in statistical data around mental health disorders such as depression and anxiety, continue to decline substantially. Between 1996 and 2018, public willingness to work closely with a coworker who had depression declined from 46% to 29% (Pescosolido et al. 2021). The improvement in the public's perception about mental health, specifically after the Germanwings incident circa 2015, may be most evident and telling through social media.

A study by Domingo-Espiñeira et al. (2024) examined X (formerly known as Twitter), which is a popular social media platform, for open discussions on mental health. The platform provides users with an avenue to share, scrutinize, and discuss public perspectives relative to mental health including, but not limited to psychiatry, psychology, and mental health professionals. Through an analysis of over 400,000 tweets (in both English and Spanish) researchers found tweets about mental health, mental health professionals, and akin disciplines showed a consistent volume between 2011 and 2016 (pre-Germanwings), followed by a gradual increase between 2016 and 2022 (post-Germanwings) (Domingo-Espiñeira et al. (2024)). Specifically, tweets in Spanish about the topic increased from 20% to 67% while tweets in English increased from 15% to 45% with users utilizing the platform to inquire about recommendations for therapy, self-help resources and strategies, and suicide prevention (Domingo-Espiñeira et al. 2024). The notable increase amongst a diverse population of users, as denoted by the two languages analyzed, on such a public platform is a clear indicator in the decline of the negative perception(s) held by the public about mental health. Part of this decline can be attributed to the increase in social media awareness of mental health issues, treatment, and support (Domingo-Espiñeira et al. 2024) and indicates a more positive perception about mental health domestically and abroad since numerous individuals were willing to be vulnerable on such a public platform in order to obtain help.

The improving perception surrounding mental health amongst the general public is also evidenced through the use of Artificial Intelligence (AI) Chatbots to help deal with mental health issue. Although the concept of AI was birthed in 1956 (Lawrence Livermore National Library, 2021), there has been a recent uptick in its awareness, utilization, integration, and incorporation of it in many facets of human life personally, academically, and professionally. Despite this uptick in usage of AI in automation, analytics, and life, many individuals are still reluctant to use AI in their daily activities because they possess a pessimistic view of it, do not understand it, and/or believe it is too opaque (De Freitas, 2025). This same reluctance to embrace AI transcends one's personal daily activities (e.g., creating a to-do list) and permeates into more sensitive areas of their lives such as their health. Research by Wang et al. (2022) examined people's perception and attitudes about the use of medical AI and found that the attitudes towards medical AI varied, but overall, many held a negative attitude toward medical AI regardless of their knowledge level.

This context about the acceptance and embrace of AI is necessary because the public's perception about mental health chatbots varies differently from their perception of medical AI usage in general. While chatbots have been used over the past 10 years to improve access to mental health care services (Abd-Alrazaq et al. 2021) the perception about mental health and AI use have not always been viewed positively as independent subjects, let alone together. However, results from research by Abd-Alrazaq et al. (2021) and Sweeney et al. (2021) found the use of chatbots for mental health have been an effective tool in treating mental health issues and users demonstrated an overall positive perception when using them. Although researchers still need to find ways to improve the AI chatbots, so they are more aligned with individual treatment recommendations, the fact people are willing to use them, despite a strong reluctance towards AI in general, to help manage their mental health with relative success indicates the public's perception of mental health, internal and external to aviation/aerospace, has changed for the better. While stigma still exists, societal trends suggest that mental health is becoming more accepted by the general public and the traveling public is more willing to be flown by crew members who may be impacted by these conditions. Although the public's perceptions of mental health has improved significantly over time after the Germanwings accident due to the passing of time, social media awareness campaigns, and the improvement of treatment options, the recent update to the FAA's approved list of medications professional pilots can take in March 2025 was a major development. Even though the list is still somewhat restrictive, one of the best medications for treating or managing mental health that is FAA-sanctioned with hardly any negative side effects is peer support (groups).

Proof in the Pudding – Peer Support as a Plausible Safeguard

The notion of peer support has been posited by scholars as a safe, effective, and efficient method to help aviation/aerospace professionals treat and manage mental health issues or challenges in a healthy way. These peer support programs constitute some of the sanctioned interventions (Hoffman, 2021) or alternative means (Daku, 2021) professional pilots shared, anonymously, that they would leverage if offered to manage their mental health. While aviation/aerospace professionals are sharing this, their insights have yet to be widely adopted by industry leaders and stakeholders. The same, however, cannot be said for collegiate aviation programs and their leadership as some have taken steps to implement aviation student-centric mental health programs. One such program is known as "Uplift" at the John D. Odegard School

of Aerospace Science located at UND. Uplift is a peer-to-peer support program for students in aviation and health sciences (Vonasek, 2023).

What makes this program unique is that it is run by students who possess an innate inclination to support their peers who may be struggling within the aviation/aerospace curriculum (Johnson et al. 2024). The purpose of the program is to train and equip students with the knowledge, skills, and abilities (KSAs) necessary to be able to assist others who may seek mental health support. In short, the Uplift program provides its beneficiaries with a sense of social or socio-emotional support (Johnson, 2024) that is rendered by their peers. Research by Winter and Rice (2015) states that strong social support may help act as a buffer against stress in the workplace, which can also mean the classroom or collegiate environment, the flight deck, the airport, etc. The positive impact of social support is accentuated by Johnson et al. (2024) who found that participants who had access to support programs and/or people they could confide in during times of adversity was commonly cited as positively impacting their mental health. The primary sources of support these participants referenced were peers and family. The important role peer support played in their mental health was further supported and accentuated in research by Johnson (2024) and Johnson (2023) who reported support from peers was instrumental in overcoming academic challenges, progressing in college, and just navigating the nuances of life as a young adult. Much of this peer support was provided through participation in an aviation-centric Registered Student Organization (RSO) (Johnson, 2024; Johnson, 2023), providing them access to knowledge, resources, people, and events they would not have had otherwise.

The measured approach and relative success of peer support programs (Vonasek, 2023; University of North Dakota Alumni Association, n.d.; Johnson et al. 2024), most notably at the collegiate level, and at some commercial operators (e.g., American Airlines – Project Wingman), can significantly help normalize mental health within aviation/aerospace. The goal is that this normalization will lead to topical de-stigmatization, improvements to safety, and increased lives saved. Although mental health is purported to be a relevant and tantamount topic in aviation/aerospace, the discourse surrounding mental health has been lacking (Johnson et al. 2024; Hoffman et al. 2024a; Hoffman et al. 2024b). Even with the increase in scholarship, the salience of peer support programs has not been fully embraced as a viable safeguard by many in the industry despite its benefits, cost-effectiveness, and success. This is adduced by Hoffman et al. (2024b) who placed peer support programs as the second research priority that warranted further exploration. Specific assertions to optimize and maintain aircrew mental health as well as to define factor in peer support programs that can result in optimal mental health states for aviation/aerospace professionals were outlined. Furthermore, the lack of peer support programs could be perceived as a barrier to mental health support and compound the other, more notable barriers, since peer support is often considered the first layer of support or step to seeking help.

Barriers to Mental Health Treatment and Support

The literature posits there are numerous barriers aviation/aerospace professionals experience that prevent them or make them less inclined to seek mental health treatment and support, some of which have been detailed in previous sections of this manuscript. While not an exhaustive list, the following comprise the primary and most profound barriers aviation/aerospace professionals experience in relation to their mental health: 1. A lack of access such as not having health insurance, and physical barriers, 2. Stigma, 3. Cultural mistrust and incompetence, 4. Shift-work (i.e., long and continuous hours), and 5. Increased social withdrawal

(Wu et al. 2016; Johnson et al. 2024). For the purposes of this section, only the broad categorical barriers of lack of access, stigma, and cultural mistrust will be discussed.

Lack of Access

The lack of access to mental health support and/or resources is a commonly cited barrier amongst many Americans and one of the most insurmountable obstacles they face. According to research by Coombs et al. (2021) out of 50,000 individuals, approximately 47,500 (or 95%) reported they experienced at least one barrier to mental health access. This difficulty accessing resources can be broken into two main categories: 1. Not knowing where or how to access the necessary support or resources and 2. Not possessing the financial means to secure the necessary support or resources. The first category, not knowing where or how to access the resources, can be linked to a lack of social acceptance and/or awareness of mental health in the upbringing of individuals (Johnson et al. 2024). This particular phenomenon is more commonly seen within the BIPOC community and very prevalent within Black American households. Since mental health conversations were essentially forbidden as children or adolescents in the homes of an already restrictive society that believed the topic should be taboo (Panchal et al. 2023; Nealon, 2021), many Americans grew up being forced to bottle their emotions (Johnson et al. 2024). Consequently, their mental health was negatively impacted and as they matured into adults who now possessed the autonomy to obtain mental health support, they did not necessarily know where or how to do so because of the lack of acceptance, embrace, and discussion about it.

The second category, inadequate financial means to secure the support or resources may sound like a minute barrier, but has and continues to pose a significant challenge for many due to the increasing cost for mental healthcare (Rowan et al. 2013). What makes this a challenge for many Americans, especially those identifying as BIPOC, is that they do not possess healthcare or insurance (Lyra Health, 2023). For instance, 10.9% and 10.8% of Black and Native Hawaiian (and other Pacific Islanders) are uninsured, respectively, (Lyra Health, 2023; Charlie Health Editorial Health Team, 2022). These numbers essentially double when examining Hispanic and American Indian and Alaskan Native people who are uninsured at 19% and 21.2%, respectively, (Lyra Health, 2023) compared to only 7.2% of White Americans who are uninsured. Even if these individuals are insured, their particular medical coverage may not cover mental health care or if it is covered, it may still be too expensive. For context, the average cost of psychotherapy in the U.S. is listed at $100 to $200 per session; treatment requiring hospitalization skyrockets into the thousands, making treatment that much more inaccessible for many. The financial inaccessibility of mental healthcare is notable for countless Americans with 42% of untreated U.S. citizens expressing cost as a barrier to them obtaining help (Lasswell, 2022). For those who work at organizations with EAPs, they may not be utilized because they are unaware of their existence or may not be structured to support mental health afflictions of employees (Johnson et al. 2024), which poses a different problem for those seeking help, but are unable to get it.

Stigma

The stigma surrounding mental health has been mentioned numerous times at various points of this manuscript because of its notable impact on individuals and their willingness to seek help, treatment, and/or resources for their mental health challenges. While mentioned several times, it has yet to be defined; stigma can be defined, “As prejudices held towards individuals that are either part of, or perceived to be part of, certain groups” (Winter & Rice, 2015). The issue with stigma(s) is that they may heavily influence a person’s perspective towards

others and typically, result in a diminishing effect of the person in the eyes of others. In other words, stigmas can cause individuals who may want or need help to avoid obtaining it due to a fear of poor social evaluations from others, such as their peers/colleagues and family (Johnson et al. 2024). One such stigma that prevents individuals, especially those within the BIPOC community, from seeking help is the illogical belief that doing so is a sign of personal weakness (National Alliance on Mental Illness, 2020; Johnson et al. 2024). Research by Lyra Health (2023) 63% of Black Americans expressed that having a mental health condition was a sign of personal weakness. A similar belief is shared amongst other cultural communities, specifically within Asian and Hispanic/Latinx cultures (Lyra Health, 2023).

This same stigma, unfortunately, exists within the aviation/aerospace context and tends to manifest itself with pilot reporting. Specifically, industry professionals believe they are or may be viewed as "less than" by others and have a perceived fear of consequences if they report mental health issues (Winter and Rice, 2015), underscoring some of the issues outlined earlier in the *Pilot Reporting of Mental Health* section. Therefore, stigmatization can be harmful because it deters individuals who need care from seeking treatment. This is compounded by the notion that those who are perceived to have mental health issues may also experience difficulty finding employment, developing social networks, and remaining independent (Winter & Rice, 2015). Further exacerbating this stigma of personal weakness is the fact that those in aviation/aerospace, particularly those in professional pilot and crew member positions, hold high responsibility positions. Such a position heightens or intensifies the duty to execute at a high level of safety, which often means suppressing mental health ailments that would impact the ability to perform their duties (Winter & Rice, 2015; Winter et al. 2017). Consequently, giving in or succumbing to the maxim of personal weakness was not something industry professionals believe they could afford to do as there is little room for error within the field. Although stigma poses as barrier to industry professionals when seeking mental health treatment, cultural mistrust, incompetence, and sensitivity have also been conveyed as significant barriers.

Cultural Mistrust

The lack of representation, specifically racial/ethnic, gender, and cultural has been contended as a long-standing barrier for Americans, especially those within the BIPOC community, in their quest to seek general and mental healthcare. This lackluster representation contributes to cultural mistrust because BIPOC and minoritized individuals have a checkered past with White and non-BIPOC medical providers. A historical example of this can be seen with Black Americans and their unethical treatment during the Tuskegee Syphilis study (Vance, 2019). Furthering this mistrust amongst Black and BIPOC individuals is a pattern of being misdiagnosed, mistreated, and misunderstood by non-BIPOC medical providers (Lyra Health, 2023). As a result, there is an extreme reluctance to fully trust, confide in, and/or seek treatment from medical professionals who are not representative because of the historic abuse and potential for harm or discrimination. Such fear of harm and discrimination is significantly heightened when the medical provider is White. With respect to mental health specifically, 84% of U.S. psychologists identify as White (Lyra Health, 2023), underscoring the reality many face relative to lacking representation in healthcare. This is further accentuated by Johnson et al. (2024) who reported that 53% of participants shared lackluster representation negatively impacted their mental health and that providers who did not look like them could not understand the underpinning of their mental health challenges. The aforementioned helps elucidate why/how cultural mistrust is a profound barrier for many in the U.S. and particularly for those in BIPOC

and minoritized communities. It also serves as a signal for the work that must be done to help redress this representation imbalance that has existed in the medical field as well as the aviation/aerospace industry, for years. In short, underrepresentation has been an area of concern for many STEM-fields and the impact of having representation as well as the need to increase it constitute just one focus area for future research and suggested actions, respectively.

Explanation of Gaps

Based on an analysis of the literature, there are several gaps identified in the current aviation/aerospace mental health scholarship that warrants further exploration. These gaps are detailed below in Table 1.

Table 1 – Explanation of Gaps

Description of Gap	Type of Gap	Associated Citation/Reference
Lack of tracking/measurement of suicide rates within aviation/aerospace, specifically for pilots and Air Traffic Controllers.	Empirical	Wu et al. 2016 Raus, 2023 Hoffman et al. 2024a Hoffman et al. 2024b
Lack of information on current FAA policies, specifically relative to mental health, and how these policies have changed over time and impacted flight incidents/accidents.	Temporal	Hoffman et al. 2024a Hoffman et al. 2023 Hoffman et al. 2019 Johnson et al. 2024
Lack of studies that examine the changes to mental health policies aviation/aerospace professionals want/request.	Temporal Methodological	Johnson et al. 2024
Lack of research on the mental health of BIPOC individuals and in particular, BIPOC aviation students and professionals.	Empirical Temporal Spatial	Johnson et al. 2024 Hoffman et al. 2024a Albelo et al. 2023 Albelo & McIntire, 2022 Albelo et al. 2022
Lack of exploration of the specific aspects of aviation/aerospace occupations that negatively impact mental health and how they can be addressed.	Theoretical	Johnson et al. 2024 Hoffman et al. 2024a Hoffman et al. 2024b Wu et al. 2016
Lack of research to identify how to optimize and screen mental health across aviation SSP, but no consensus exists on the research priorities that need to be met.	Empirical Conceptual	Hoffman et al. 2024a

Lack of exploration between the relationship between mental health symptoms, performance, and safety.	Theoretical	Hoffman et al. 2024b

Expected Contributions

There are four expected contributions of this literature review to the aviation/aerospace field: two theoretical and two practical. The first theoretical contribution is that it provides a relatively comprehensive review of extant mental health literature that examines several areas of interest for convenient access to those committed to advancing mental health discussions given the relevance and timeliness of mental health in the U.S. This is a paramount contribution because of the synthesis and organization of existing knowledge for easier access and deeper understanding of a nuanced and borderline contentious topic. The second theoretical contribution is the clear outline of where the gaps exist in mental health scholarship particularly as it relates to aviation/aerospace research. This contributes to the academy by identifying areas needing further research, serving as a guide for scholars who plan to conduct future studies. Consequently, they can investigate mental health with intentionality to address the gaps and advance the topic across several fields/disciplines such as aviation/aerospace, STEM, and the social sciences.

The first practical contribution is that it serves as a launch point for OBAP, and similar organizations interested in prioritizing and supporting the mental health of their members by furnishing them with a starting point. The second practical contribution, which is complementary to the first, is that it provides a pointed set of recommendations or suggested actions for practitioners and those in leadership positions who are unsure of how or where to start regarding mental health. This essentially gives organizational leadership a concise guide of action items to take so they may begin centering mental health in their organization. While this manuscript aims to provide a deep review of the literature relative to aviation/aerospace mental health, composing its overarching contribution, it reiterates (almost at nauseum) what is already known by many. This being that although mental health challenges can be difficult to navigate, they are and should not be automatic disqualifiers to a career in aviation/aerospace and when access to treatment is possible, those impacted by mental health can perform their duties at a high level in a safe, efficient, and effective manner despite what the media, pundits, and others may say.

Recommendations for Future Research and Calls-to-Action

Through a comprehensive analysis of the literature, numerous recommendations for future research and calls-to-action have been identified. These recommendations and calls are detailed below and have been centered around theory, policy, and practice.

Future Research

The first area of future research should be focused on, as posited by scholars, is further refining the definition of certain mental health terms and disorders as it relates to aviation/aerospace, especially since some terms from the medical field are not directly transferable or applicable to aerospace medicine, and conducting a systematic gap analysis on aviation mental health scholarship (Hoffman et al. 2024b). This manuscript, in part, aims to accomplish such a gap analysis while providing a contemporary document that will help guide actions by researchers, industry leaders, congressional leadership, and stakeholders to be intentional in bridging the gaps that exist.

The second area of research that should be explored is the effectiveness of mental health services sought from various sources such as EAPs, their communities of support (e.g., friends and family), and/or peer support programs. This also includes examining the impact of alternative forms of mental health care that does not require direct engagement with medical professionals such as mindfulness training, breathing techniques and meditation, and internet-based cognitive behavioral therapy (Raus, 2023; Johnson et al. 2024).

The third area of future research should center on specific occupations or sectors of Black aerospace professionals to ascertain if there are any parallels or differences between the mental health experiences, factors, and/or needs across these occupations or sectors. This also includes conducting a comparative analysis between Black aerospace professionals and other BIPOC groups within the industry (Johnson et al. 2024). Doing so allows for minoritized or underrepresented groups operating within the industry to be examined as means to understand their mental health needs, wants, and experiences and potentially compare/contrast them to other racial/ethnic groups. This particular recommendation for future research would not only benefit Black aviation/aerospace professionals, but also BIPOC and other minoritized professionals.

The fourth area of research that should be explored in the future are longitudinal studies within aviation/aerospace to track the mental health outcomes of aviation/aerospace professionals over time, beginning with Black and BIPOC professionals. This particular recommendation for future research would not only benefit Black and BIPOC aviation/aerospace professionals, but also other minoritized professionals.

Calls-to-Action

Based upon the review of the literature, the following calls-to-action, which are centered around theory, policy, and practice, should be considered:

Theory

1. Given the lack of research that exists about the mental health of those working within aviation/aerospace occupations, scholars/researchers should explore specific elements of these occupations to understand what aspects or facets of the job impact their mental health as well as deriving how the adverse impacts can be addressed and/or mitigated.
2. Since mental health is slowly becoming a more embraced topic within society and the U.S. aviation/aerospace industry, exploration of the relationship between mental health symptoms, performance, and safety is an area that warrants attention, especially considering the FAA's recent modifications to the medical certification process as it relates to mental health diagnoses and medications.

Policy

1. Call-to-Congress: Make the current Mental Health Aviation Rulemaking Committee a permanent body of the Federal Aviation Administration.
2. Call-to-Congress: Enhance the accessibility to mental health resources for professionals seeking help to streamline the process and lessen financial obstacles that impede mental health service(s) retention.
3. Call-to-Congress: Mandate employers to offer health insurance coverages that include mental health and substance use disorders to enhance the affordability of and access to mental support services. Such a recommendation is timely and necessary since only 43%

of U.S. employees reported that their employer offered such health insurance coverage (American Psychological Association [APA], 2023).[4]

Practice

1. Create explicit mental health policies (e.g., allowance of mental health days) employees can utilize when experiencing mental health challenges rather than relying on an all-encompassing fatigue policy.
2. Implement mental health "safety stand-downs" to add a source of support for employees, demonstrate mental health prioritization within the organization, and to clarify any mixed messaging occurring between various leadership levels.
3. Aviation/aerospace employers should adopt mandatory mental health training for managers at all levels (including those in the C-Suite) to mitigate mixed messaging and complement the recommendation pertaining to safety stand-downs. More importantly, this recommendation adds another level of safety to the organization and support for employees by equipping managerial personnel with the knowledge and tools necessary to be able to assist others experiencing mental health challenges.
4. Aviation/aerospace employers should implement anonymous mental health reporting systems to improve organizational transparency and cognizance of mental health challenges. Such a system could also facilitate "temperature checks" within the organization, especially around certain social, political, economic, and/or environmental issues that may arise and impact employees. A good first step to accomplish this may be implementing an anonymous safety reporting system within the organization that can be used to receive general safety items, but include specific questions or a section relative to employee mental health and/or well-being.
5. Include and fund updated BIPOC data collection and culturally responsive screenings.
6. Fund and create continuous culturally responsive education and training for mental health practitioners.
7. Fund and implement diverse recruitment and retention of BIPOC practitioners and volunteers for mental health care settings.

Note: The recommendations for practice numbered five through seven would not only benefit BIPOC aviation/aerospace professionals, but also other minoritized professionals (e.g., Asians, Hispanic, LGBTQIA+, etc.).

Conclusion

This literature review identified key mental health challenges faced by aviation/aerospace professionals, particularly those from minoritized backgrounds. Mental health challenges and disorders have risen across groups in the U.S. and a vast majority of Americans believe we are experiencing a mental health crisis. There is a lack of resources available and the resources that are available tend to be inaccessible for individuals within certain demographics or populations. This reveals a sad truth and presents somewhat of a "Catch 22" situation in that as mental health

[4] The first three policy calls-to-action, which are the Calls-to-Congress, are stated (either directly or indirectly) in H.R.2591 – Mental Health in Aviation Act of 2025 (H.R. 2591, 2025). This bill was introduced in the U.S. House of Representatives Transportation & Infrastructure Committee in April 2025 and is currently awaiting further action.

trends towards a more embraced topic and individuals become more inclined to seek help, there are not enough resources available for all who need treatment to receive it. Such a phenomenon is especially concerning for BIPOC individuals who face additional hardships that lead to worse mental health outcomes because their access to mental health care is often limited largely by cultural stigmas and unaffordability. Black Americans are less likely to seek mental health care due to a lack of trust in the U.S. healthcare system that has abused them and a lack of social acceptance regarding mental health discussions. Aviation/aerospace professionals explicitly name a lack of access, stigma, and cultural mistrust as barriers to receiving treatment and yearn for sanctioned alternatives to address their mental health. In addition to personal wellbeing, addressing mental wellness is critically important in improving an individual's performance and safety in the workplace.

In aviation/aerospace specifically, pilots' mental health is of utmost importance as low psychological stress has been linked to fewer workplace incidents and accidents. This issue has proven difficult to address because discussing mental health concerns is heavily stigmatized and can potentially result in the loss of a medical certificate. Whether the pilot flies as a hobby or for their livelihood, most are not willing to risk losing their privilege to fly by self-reporting mental health concerns such as depression. There is also a lack of clarity on which mental health services or treatments must be reported to the regulators. Consequently, pilot underreporting and misrepresenting has become prevalent in the U.S. and abroad as evidenced by Canadian pilots.

Historically, there has been a negative perception of pilots seeking mental health, but as a result of tragic accidents that were linked to mental health concerns, regulators have begun taking a different approach. The FAA Mental Health ARC has worked towards creating a culture where mental health can be discussed more openly and making mental health resources more readily available. Additionally, nonprofits like PMHC have made it their mission to promote pilot mental health and reform government regulations regarding mental health. OBAP has also championed pilot mental health by creating the MHTF to advance the mental health, fitness, and well-being of aviation/aerospace professionals with a focus on those from minoritized backgrounds, by fostering collaboration, innovation, advocacy, and establishing resources.

While the FAA still largely limits which medications are approved to treat mental health conditions, peer support seems to be a promising route. Collegiate programs have been leaders in creating peer-to-peer support systems and although commercial airlines have started to adopt similar programs, many in the industry have not fully embraced such programs yet. However, professional pilots have indicated they would participate in such programs if made available. The support of peers helps mitigate stress and depression during times of adversity. This allows for more open communication about mental health and seems to be key to addressing challenges and destigmatizing mental health.

Recommended areas of future research include refining the definitions of mental health terms in a way that is more applicable to the aviation/aerospace community. Further, alternative forms of mental health care such as mindfulness training and cognitive behavioral therapy should be explored, especially those that do not require reporting to the FAA as pilots are more likely to engage with those practices. Most research on aviation/aerospace professionals focuses on those in pilot positions. As such, it would be beneficial to conduct studies that elucidate whether there are similarities or differences in mental health for Black and BIPOC professionals in different occupations within the industry. Finally, conducting longitudinal studies would provide crucial data on mental health trends in the field. This would be especially beneficial in determining if some of the newer approaches to mental health have had an impact.

Based on the research that has already been conducted and reviewed here, theoretical, policy, and practical calls-to-action have been identified. Theoretically, scholars should focus their research efforts on exploring the pervasive relationship between occupational demands in aviation/aerospace and the mental health outcomes of industry professionals as well as the relationship(s) that exists between mental health, safety, and performance. In regard to policy, Calls-to-Congress include making the current Mental Health ARC a permanent body of the FAA, making mental health resources more accessible and affordable, and mandating that employers offer health insurance that covers mental support services. Some of the changes that can happen in practice to improve mental health outcomes include creating mental health policies that allow employees to take time off, incorporating mental health "safety stand-downs," implementing mandatory mental health training, and creating anonymous mental health reporting systems. It is important these changes also be culturally relevant. Practical changes in that regard include focusing on BIPOC data collection, creating culturally responsive screenings, creating culturally responsive education and training for mental health practitioners, and funding diverse recruitment/retention of BIPOC practitioners and volunteers for mental health care settings. It is critically important that the approach to aerospace professionals' mental health be modernized and access to resources be improved so they can function safely and at the highest level in jobs that demand focus, attention, and a sense of calm.

As a reminder, the impetus of this literature review stemmed from the MHTF enacted by OBAP in response to the need to research and ascertain the history of mental health in the industry as well as the needs, challenges, and barriers professionals face when seeking treatment. That said, the MHTF had three objectives to guide its actions, which doubled as goals for this manuscript. Those objectives were to 1. Identify key mental health challenges faced by aviation/aerospace professionals, particularly those from minoritized backgrounds, 2. Identify what aviation/aerospace professionals, especially pilots, need to improve their mental health, and 3. Conduct research and gather knowledge on Black aviation/aerospace professionals relative to mental health. All three of these objectives have been thoroughly accomplished through the various sections of this manuscript, providing a rather extensive review of past and present scholarship with some ideas proffered for the future. While this manuscript is not all-encompassing, it does provide those interested in making mental health a more permissive and comfortable topic in aviation/aerospace with a solid starting point to act given the compilation of historic and contemporary literature reviewed. The hope is that this review can be used to continue to move the needle in the positive direction relative to aviation/aerospace mental health and more importantly, that the knowledge shared here can help prevent a mental health condition from worsening, provide someone with a place to start the treatment journey, guide someone to resources, and/or save a life.

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industry, having the courage to participate in the numerous studies referenced in this manuscript despite their fear of consequences, change cannot and would not occur. To those currently battling mental health challenges, we see you, we appreciate you, we support, and we stand with you. To those who unfortunately, lost their lives fighting such battles, your legacy lives on and we hope this manuscript continues to be the torch that lights the way towards a brighter future where mental health support is the norm and not the exception.

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