Intelligent Human Systems Integration (IHSI), Vol. 200, 2026, 31–40
https://doi.org/10.54941/ahfe1007062

CRMSON: Co-Designing Adaptive and Ethical AI Systems to Address Mental Health Barriers in Aviation

Kimberly Perkins[1] and Fabio Mattioli[2]

[1]Human Centered Design & Engineering, University of Washington, Seattle, WA, 98195, USA

[2]School of Social and Political Sciences, University of Melbourne, Parkville, VIC 3010, Australia

ABSTRACT

In aviation, the ability to maintain an aeromedical certificate is essential for employment, yet the very system designed to ensure safety often discourages mental health disclosure. Drawing on novel survey data (n = 1,577), this study reveals a striking paradox: while 98% of pilots and air traffic controllers identify mental health as a major industry concern, only 12% report accessing available support services. Barriers are primarily psychological—rooted in stigma, mistrust, and fear of career repercussions—rather than structural. In the United States, mandatory disclosure requirements on aeromedical forms exacerbate this culture of silence, compelling many to conceal symptoms or avoid care altogether. In response, this paper introduces CRMSON, the first AI-powered resilience platform co-designed by pilots, for pilots. Grounded in human-centered design and ethical AI principles, CRMSON delivers discreet, evidence-based microinterventions that cultivate emotional intelligence—a proven predictor of psychological resilience. Through qualitative research, participatory design workshops, and model validation across industry experts, CRMSON integrates affective science with operational realism to provide stigma-free, context-aware support. Rather than replacing professional care, CRMSON functions as scaffolding within constrained systems—reinforcing emotional regulation, self-awareness, and adaptive coping. This work reframes AI not as surveillance or automation but as an ethical architecture of care, restoring agency to aviation professionals navigating the tension between safety and psychological well-being.

Keywords: Aviation mental health, Emotional intelligence, Psychological resilience, Ethical AI, Human factors, Aeromedical policy, Co-design

INTRODUCTION

Can AI technology support mental health in highly-regulated, high-stakes industries like aviation? LLM-based chatbots fail short of providing the therapeutic care that we expect from professional therapists. Indeed, several highly publicized cases demonstrate that treating AI systems as personal therapists can lead to negative, even fatal, consequences. At the same time, recent literature on digital health suggests that, like most other aspects of contemporary life, mental health is also moving to the digital realm.

Received September 18, 2025; Revised November 10, 2025; Accepted November 25, 2025; Available online February 1, 2026

This transformation offers opportunities. For sectors like aviation, where mental health challenges have long been sidestepped, AI-based chatbots offer an opportunity to rethink and, perhaps, address the structural challenges that prevent access to treatment–at least for solutions that have been designed around, by, and for the intended users.

In this paper we suggest that co-designed AI-based solutions can offer a pathway to identify barriers and improve mental health outcomes in regulated sectors like aviation. We take a human-centered design approach, aimed not only at optimizing the interaction between humans and machines, but at empowering professionals in aviation. We describe the methodology used to develop the first human performance platform in aviation and aerospace designed explicitly to support the psychological and emotional resilience of those working inside such systems. By combining ethical artificial intelligence with the principles of human-centered design, the platform seeks to counteract the institutional barriers that have long hindered open dialogue about mental health. Rather than focusing solely on compliance or performance metrics, it prioritizes the individual (pilot, instructor, aviation professional, etc) as a complex human agent navigating an environment shaped by both high responsibility and systemic vulnerability.

The platform's core feature, an AI-driven conversational agent, provides evidence-based tools in emotional intelligence and psychological resilience. It is intentionally discreet, offering a confidential space where pilots can reflect and seek support without fear of professional reprisal. In doing so, it addresses the pervasive culture of fear and self-silencing that has become embedded within the aeromedical system and broader aviation culture surrounding mental health.

Institutional Barriers to Pilot Mental Health: The Culture of Silence in Aviation

An extensive body of scholarly and gray literature (Bor, Field, & Scragg, 2002; Venus et al., 2022; Pitts & Faulconer, 2023; Walden & Thomas, 2025; Flight Safety Foundation, n.d.; Royal Aeronautical Society, 2024) underscores increasing concern regarding the mental health of professional pilots. Empirical findings (Wu et al., 2016) further suggest that airline pilots may experience disproportionately elevated rates of depression compared to the general population. This has been attributed to a constellation of occupational stressors, including high levels of responsibility, continuous professional scrutiny (Bor, Field, & Scragg, 2002), chronic fatigue, and—perhaps most significantly—a cultural expectation of constant competence and composure. As Perkins et al. (2024) notes, this "performative Type-A hero" archetype can cultivate environments where vulnerability is perceived as weakness rather than humanity.

However, while these cultural and operational factors play a role, the most profound contributor appears to be the institutional structure itself—specifically, aeromedical policies that inadvertently suppress disclosure and delay intervention.

A phenomenological study of airline pilots (Cross et al., 2024) found a pervasive "culture of silence" surrounding mental health disclosure, in which pilots routinely withhold experiences of depression, anxiety, or emotional distress. In this study of the United States-based sample, 81% of airline pilots reported being aware of available mental health resources yet stated they would not use them due to distrust and fear of losing their medical certification or livelihood (pg. 5).

In the United States, pilots are required to complete FAA Form 8500-8 annually (if under 40) or biannually (if over 40) to maintain their aviation medical certificate—a prerequisite for exercising the privileges of their pilot license. The form asks, *"Have you ever in your life been diagnosed with, had, or do you currently have any mental disorder of any sort (e.g., depression, anxiety, etc.)?"* (FAA Form 8500-8). For many pilots, this question represents an institutional disincentive to seek care: a "yes" response may trigger further evaluation, certification delays, or suspension, making honesty a potential career-limiting act.

Importantly, this culture of silence is not confined to the United States. In a global study of 1,577 pilots and air traffic controllers from six continents, an overwhelming majority voiced moderate or greater concern about the state of mental health in aviation (Perkins, Merola & Hasan, in press). Yet only 12% of respondents reported accessing mental health resources. When asked why, psychological barriers—such as stigma, mistrust in confidentiality, and fear of punitive consequences—were cited twice as often as structural barriers (66% vs. 34%, respectively) (pgs. 3–5).

As one pilot stated, *"Report nothing, because it will only hurt you"* (Cross et al., 2024, p. 5). These sentiments echo across numerous studies (Hubbard, 2016; Venus et al., 2022; Minoretti, 2025), highlighting that fear and mistrust remain entrenched features of the aviation safety culture.

Even the Federal Aviation Administration (FAA) has acknowledged these barriers. In its Mental Health ARC Final Report (2024), the FAA identified culture, trust, fear, and stigma as critical systemic challenges to disclosure and early intervention. The report proposed 24 recommendations to address these issues, including reducing stigma, improving trust in disclosure systems, modernizing policies on treatment and medication, strengthening peer support programs, and improving mental health literacy throughout the aviation community.

Taken together, these findings highlight that the central challenge to system resilience in aviation lies not in a lack of awareness or policy intent, but in the structural and cultural constraints that continue to prevent pilots and controllers from safely seeking mental health support.

Applied Response to Institutional Constraints

Recognizing the entrenched institutional barriers—and acknowledging that systemic aeromedical policy reform is best advanced by larger regulatory or advocacy organizations (e.g., *Pilot Mental Health Campaign*)—our objective was to develop an immediate, practical tool that pilots and aviation professionals could use *within* the current system to support well-being and the bolstering of psychological resilience.

Recent research supports the potential of AI-mediated emotional support to bridge this gap. Hu et al. (2025) found that venting to an AI chatbot improved emotional well-being, reduced stress and loneliness, and enhanced perceived social support. Complementary findings by Li et al. (2025) examined AI-assisted cognitive reappraisal—the process of reframing negative emotional experiences—using GPT-4. Across four studies (n = 3,740), GPT-4 generated more effective reappraisals than human responders. However, when participants knew the reappraisal was AI-generated, their evaluations were lower. This suggests that AI systems may, on occasion, outperform humans in emotional reframing, yet persistent biases toward AI may diminish perceived value or acceptance.

Further research has validated AI's capacity to capture and support subjective well-being (Mesquiti et al., 2025) and to play a meaningful role in mental health screening, engagement, and early intervention (Balcombe, 2025). However, a consistent limitation across existing mental health chatbots—such as Wysa, Woebot, and Youper—is the absence of stakeholder co-design, leading to limited contextual alignment with the user's lived experience (Balcombe, 2025).

To address this gap, we developed the first AI-powered psychological resilience coach designed by pilots, for pilots. By embedding domain-specific expertise and lived experience into the design process, our aim was to create a tool that is both psychologically credible and operationally relevant.

METHOD

This research employed a four-tier, mixed qualitative and computational design to ensure both ethical integrity and operational relevance. The first tier involved semi-structured interviews with airline pilots and aviation professionals to capture lived experiences and form the foundation of CRMSON's dataset. The second tier was an intensive three-day co-design workshop, where participants refined the system's tone, usability, and trust architecture. The third tier focused on model fine-tuning, aligning emotional intelligence constructs with the global pilot competency framework to embed human factors principles into AI reasoning. The fourth tier conducted industry validation, benchmarking CRMSON against leading large language models through hands-on evaluation with aviation professionals. Together, these stages created a rigorously co-designed, domain-specific framework for integrating ethical AI into aviation safety and human performance systems.

Semi-Structured Interviews and Data Foundation

Recognizing that co-design was essential to ensuring the system's relevance and legitimacy among end users, we adopted a qualitative, human-centered design methodology that embedded user perspectives throughout all stages of CRMSON's development. With Institutional Review Board (IRB) approval from the University of Melbourne, our research team conducted over 50 hours of semi-structured interviews with airline pilots and aviation professionals representing diverse operational backgrounds, aircraft types, and organizational cultures. The objective was to elicit detailed

narratives illustrating both effective and ineffective teamwork dynamics within the flight deck, including examples of communication breakdowns, leadership challenges, and conflict resolution strategies. These accounts were transcribed, thematically coded, and augmented into a corpus of several thousand validated exemplars of high- and low-performing team interactions. These were then supported by the analysis of 1,800 NASA Aviation Safety Reporting System (ASRS) incident reports focused on communication and coordination breakdowns. Together, these data formed the first by-pilots, for-pilots dataset explicitly designed for AI-based Crew Resource Management (CRM) applications, serving as the foundational training material for our prototype and anchoring the model's reasoning in authentic, domain-specific experiences rather than synthetic or generic conversational data.

To complement this qualitative foundation, we developed microinterventions (short, context-aware learning) and behavioral nudges integrated into CRMSON's architecture. These were intentionally designed to strengthen cognitive and emotional regulation in operational settings, drawing from a robust body of academic literature (Armstrong, Galligan, & Critchley, 2011; Gey et al., 2025; Joyce et al., 2018; Kartol et al., 2024; Schneider, 2013) that identifies emotional intelligence (EI) as a key predictor of psychological resilience.

In this context, emotional intelligence refers to the capacity to accurately perceive, understand, and manage one's own emotions and those of others to facilitate effective thought and action under pressure (Mayer, Salovey & Caruso, 2004). Psychological resilience, meanwhile, refers to adaptability in the face of adversity, stress, or strain, which is characterized by the capacity to maintain or regain well-being through cognitive, emotional, and behavioral flexibility (Fletcher & Sarkar, 2013; Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). Integrating these constructs into CRMSON's learning framework allowed us to embed scientifically grounded mechanisms that support both immediate situational effectiveness and long-term wellbeing—bridging the gap between theory and lived flight-deck experience.

The qualitative corpus was subsequently coded, anonymized, and transformed into a structured vector dataset, forming the contextual foundation for the CRMSON prototype and its retrieval-augmented generation (RAG) architecture. This iterative, ethically grounded process positioned the study not only as a data collection effort, but as a methodological intervention—one that sought to integrate ethnographic insight, co-design principles, and AI system development into a unified, care-centered research framework.

Intensive Three-Day Co-Design Workshop

To further advance the co-design process, a three-day in-person co-design intensive workshop was held in 2025, bringing together aviation subject-matter experts, human factors researchers, and airline pilots. Participants interacted directly with early CRMSON prototypes, exploring usability, linguistic framing, and ethical decision boundaries through simulated interpersonal challenges. The workshop emphasized ethnographic care and participant agency, creating a collaborative space where pilots shaped the

system's tone, relevance, and trust architecture. This setting also enabled the collection of fine-grained feedback on AI responsiveness, including sensitivity to emotional nuance, perceived empathy, and the balance between authority and support in AI-generated responses.

Fine-Tuning Our Prompt Architecture and Iterative Prototyping

To ensure CRMSON's reasoning engine reflected authentic human dynamics rather than generic AI outputs, we fine-tuned its prompt architecture through iterative, domain-specific prototyping. Insights from the interviews and workshop informed a multi-tiered model training strategy. The third tier of development mapped Goleman's five facets of Emotional Intelligence (self-awareness, self-regulation, motivation, empathy, and social skills) (Goleman, 1995) to the international pilot competency framework and their accompanying 73 observable behaviors (International Air Transport Association, 2025). This mapping enabled the model to align affective competencies with regulatory and operational standards, integrating socio-emotional intelligence directly into CRM reasoning pathways. Subsequent iterations incorporated iterative feedback loops from aviation professionals using low-code prototyping environments (n8n, WhatsApp, and AWS-based back-end systems). This process allowed rapid calibration of system tone, accuracy, and inclusivity while maintaining traceability between design decisions and user-derived insights.

Industry Validation and Comparative Evaluation

The fourth methodological tier involved comparative model validation against four publicly available large language models (LLMs). This phase culminated in an interactive evaluation workshop held at an international aviation psychology conference, where over 50 aviation professionals including pilots, safety managers, and human factors specialists tested CRMSON alongside comparator models in realistic, scenario-based interactions. Participants provided quantitative performance assessments (accuracy, contextual fit, tone appropriateness) and qualitative usability feedback, which informed further model refinement. This phase validated CRMSON's relative strength in emotional intelligence alignment and contextual accuracy, affirming its role as a co-designed, domain-specific sociotechnical system intentionally crafted to advance safety and resilience in aviation.

RESULTS

Preliminary findings demonstrate strong validation for CRMSON as both a technical and socio-cognitive innovation in the domain of aviation human factors. In a comparative evaluation involving over 50 aviation professionals, 82% of participants expressed a clear preference for CRMSON over other leading AI models tested in parallel. Participants emphasized CRMSON's aviation-specific contextual accuracy, emotionally intelligent tone, and its ability to authentically reflect the lived realities of flight deck operations. As

one captain observed, "*This will fundamentally improve our industry as a whole.*"

Thematic feedback reinforced CRMSON's dual role as both an operational support tool and a resource for psychological resilience. One pilot reflected, "*I like the coaching feature that helps build my emotional intelligence through more reading. Well done!*" Another added, "*People need to rant and feel heard. This is the perfect avenue to do this.*" Such comments illustrate how CRMSON extends beyond procedural optimization to foster human-centered reflection, emotional regulation, and adaptive teamwork—elements essential to resilient performance in high-stakes environments.

A major outcome of this research was the creation of the first-ever "by-pilots, for-pilots" knowledge graph, a neuro-symbolic framework that hardcodes ethical AI practices into CRMSON's architecture. This hybrid system combines the statistical adaptability of modern large language models with the reasoning precision of symbolic AI, enabling structured inference around human performance, mental health, and interpersonal dynamics. The result is a domain-specific knowledge graph capable of mapping and reasoning through constructs such as psychological safety, emotional intelligence, and resilience in the flight deck. This approach ensures that CRMSON's outputs remain both contextually grounded and ethically auditable, setting a new precedent for responsible AI in safety-critical domains.

Framework for Discreet, Resilience-Aligned Support: CRMSON introduces an evidence-based framework for discreet, stigma-free psychological support that complements existing training and safety systems while promoting emotional resilience across the aviation workforce.

Ethical and Complementary AI Design: The system positions AI as a complementary tool—one that amplifies systemic reform and professional mental health care rather than replacing them. This ensures that AI operates not as a substitute for human connection, but as an enabler of human understanding.

In essence, CRMSON reframes the role of AI in aviation: from automation to augmentation, from prediction to empathy, and from efficiency to ethical care. Built on the lived experiences of pilots and structured through principles of psychological safety, it reminds us that the true measure of intelligent systems is not how human they sound, but how humanely they serve.

CONSOLIDATED LESSONS LEARNED

Three central lessons emerged from the co-design and evaluation of CRMSON.

1. First, trust cannot be engineered—it must be cultivated. Pilots engaged most deeply when they recognized their own voices and experiences

reflected in the system's responses. Co-design transformed participants from subjects into collaborators, validating that inclusion is a design methodology, not a communication strategy.
2. Second, contextual intelligence outweighs computational power. CRMSON's advantage over larger, general-purpose LLMs stemmed not from scale but from relevance—its capacity to interpret and respond through the lens of aviation culture, operational nuance, and emotional reality. Even the world's largest models, with vast budgets and data pipelines, cannot replicate the depth of understanding that emerges through co-design, lived experience, and academic rigor. This finding underscores that the effectiveness of AI in high-stakes domains depends as much on sociotechnical alignment as on algorithmic sophistication.
3. Third, ethical AI requires infrastructure, not ideology. The construction of a by-pilots, for-pilots knowledge graph demonstrated that ethical safeguards can be embedded into architecture—through transparent reasoning structures, traceable data provenance, and neuro-symbolic logic that constrains behavior in line with human-centered principles. In other words, ethical AI must be built, not merely declared.

CONCLUSION

At its core, CRMSON represents a reimagining of what technology can do for human systems under strain. It does not promise to heal trauma, rewrite policy, or replace human care. Rather, it listens—to the stories of fatigue, courage, and silence that sometimes define the flight deck—and transforms them into scaffolding for resilience. In doing so, it challenges a long-standing paradox: that the systems designed to protect pilots have also taught them to hide their pain.

By bridging the precision of symbolic reasoning with the empathy of human-centered design, CRMSON models a future where AI does not compete with humanity but restores its complexity. It reminds us that technology, when informed by care and constraint, can illuminate the very qualities that make people irreplaceable: awareness, reflection, and connection.

In the end, the promise of ethical AI is not perfection—it is presence. It is the quiet assurance that, even in the most regulated and surveilled of professions, there remains space for what is deeply human: to be seen, to be heard, and to be understood.

CRMSON redefines disruption as an ethical act: using intelligence not to automate the human away, but to bring humanity back into intelligent systems.

ACKNOWLEDGMENT

We extend our deepest gratitude to the pilots, aviation professionals, volunteers, and students who gave not only their time, but their insight, courage, and emotional labor to this project. To those who crossed oceans to join us in person, and to those who shared their stories from afar—you

transformed research into relationship and data into meaning. This work exists because you believed in the possibility of something better for our industry. For your trust, your candor, and your steadfast hope—thank you.

REFERENCES

Armstrong, A.R., Galligan, R.F. and Critchley, C.R., 2011. *Emotional intelligence and psychological resilience to negative life events. Personality and Individual Differences*, 51(3), pp.331–336. https://doi.org/10.1016/j.paid.2011.04.028

Balcombe, L., 2025. *AI chatbots in mental health care: Integrative review of challenges and solutions* [Preprint]. *Preprints.org*, 23 September. https://doi.org/10.20944/preprints202509.1893.v1

Bor, R., Field, G. and Scragg, P., 2002. *The mental health of pilots: An overview. Counselling Psychology Quarterly*, 15(3), pp. 239–256. https://doi.org/10.1080/09515070210143471

Cross, D.S., Wallace, R., Cross, J. and Mendonca, F.C., 2024. *Understanding pilots' perceptions of mental health issues: A qualitative phenomenological investigation among airline pilots in the United States. Cureus*, 16(8), e66277. https://doi.org/10.7759/cureus.66277

Federal Aviation Administration, 2024. *Application for airman medical certificate (Form 8500-8)*. U.S. Department of Transportation. Available at: https://www.faa.gov/forms/index.cfm/go/document.information/documentid/185491 [Accessed 21 Oct. 2025].

Federal Aviation Administration, 2024. *Mental health and aviation medical clearances aviation rulemaking committee: Final report (Release)*. 1 April. Available at: https://www.faa.gov/sites/faa.gov/files/Mental_Health_ARC_Final_Report_RELEASED.pdf [Accessed 21 Oct. 2025].

Fletcher, D. and Sarkar, M., 2013. *Psychological resilience: A review and critique of definitions, concepts, and theory. European Psychologist*, 18(1), pp. 12–23. https://doi.org/10.1027/1016-9040/a000124

Flight Safety Foundation, n.d. *Mental health and wellness*. Available at: https://flightsafety.org/toolkits-resources/mental-health-and-wellness [Accessed 21 Oct. 2025].

Gey, J.W., Yap, C.K., Leow, K. and Lo, Y.Y., 2025. *Resilience as a mediator between emotional intelligence (EI) and perceived stress among young adults in Malaysia. Discover Mental Health*, 5(1), 37. https://doi.org/10.1007/s44192-025-00166-w

Goleman, D., 1995. *Emotional intelligence: Why it can matter more than IQ*. New York: Bantam Books.

Hu, M., Ho, J.Q.H., Ng, C., Wong, S.S.M. and Hartanto, A., 2025. *Emotional support through AI: Venting to artificial intelligence or a human may offer comparable emotional well-being benefits* [Preprint]. *OSF*. https://doi.org/10.31234/osf.io/vf4wu_v1

Hubbard, T.P., 2016. *Stigma and pilots with mental health issues. International Journal of Aviation Sciences*, 1(2), pp. 1–12. Available at: https://repository.fit.edu/cgi/viewcontent.cgi?article=1014&context=ijas [Accessed 21 Oct. 2025].

International Air Transport Association, 2025. *Competency assessment and evaluation for pilots, instructors and evaluators: Guidance material* (4th ed.) [Guidance document]. Available at: https://www.iata.org/contentassets/c0f61fc821dc4f62bb6441d7abedb076/competency-assessment-and-evaluation-for-pilots-instructors-and-evaluators-gm.pdf [Accessed 21 Oct. 2025].

Joyce, S., Shand, F., Tighe, J., Laurent, S.J., Bryant, R.A. and Harvey, S.B., 2018. *Road to resilience: A systematic review and meta-analysis of resilience training programmes and interventions. BMJ Open*, 8(6), e017858. https://doi.org/10.1136/bmjopen-2017-017858

Kartol, A., Üztemur, S., Griffiths, M.D. and Şahin, D., 2024. *Exploring the interplay of emotional intelligence, psychological resilience, perceived stress, and life satisfaction: A cross-sectional study in the Turkish context. BMC Psychology*, 12, Article 362. https://doi.org/10.1186/s40359-024-01860-0

Mayer, J.D., Salovey, P. and Caruso, D.R., 2004. *Emotional intelligence: Theory, findings, and implications. Psychological Inquiry*, 15(3), pp. 197–215. https://doi.org/10.1207/s15327965pli1503_02

Minoretti, P., 2025. *Barriers and facilitators to mental health support among airline pilots: A narrative review. Cureus*, 17, e91340. https://doi.org/10.7759/cureus.91340

Perkins, K., Merola, R.H., Ghosh, S. and Aragon, C., 2024. '*I'm a pilot first, female second': Why flight deck gender imbalance persists and the case for allyship. Journal of Aviation/Aerospace Education & Research*, 33(2). https://doi.org/10.58940/2329-258X.2025

Perkins, K., Merola, R.H. and Hasan, T., in press. *From awareness to action: Mapping emotional intelligence to pilot performance and policy reform in aviation mental health. Human Factors in Design, Engineering, and Computing: AHFE 2025 International Conference*. AHFE Open Access.

Pitts, L. and Faulconer, E., 2023. *Flying under the radar: A survey of collegiate pilots' mental health to identify aeromedical nondisclosure and healthcare-seeking behaviors. Collegiate Aviation Review International*, 41(1), pp. 115–133. https://doi.org/10.22488/okstate.23.100233

Royal Aeronautical Society, 2024. *Psychosocial risk management and mental health: The mental health challenge to civil aviation safety in the 21st century* (Briefing Paper, RAeS Human Factors Specialist Group). London: Royal Aeronautical Society. Available at: https://www.aerosociety.com/media/23684/mental-health-and-wellbeing-raes-paper-updated-version.pdf [Accessed 21 Oct. 2025].

Schneider, T.R., 2013. *Emotional intelligence and resilience. Personality and Individual Differences*, 55(8), pp. 909–914. https://doi.org/10.1016/j.paid.2013.06.002

Southwick, S.M., Bonanno, G.A., Masten, A.S., Panter-Brick, C. and Yehuda, R., 2014. *Resilience definitions, theory, and challenges: Interdisciplinary perspectives. European Journal of Psychotraumatology*, 5(1), 25338. https://doi.org/10.3402/ejpt.v5.25338

Venus, M., Greder, D. and Grosse Holtforth, M., 2022. *How professional pilots perceive interactions of working conditions, rosters, stress, sleep problems, fatigue and mental health: A qualitative content analysis. Revue Européenne de Psychologie Appliquée*, 72(3), Article 100762. https://doi.org/10.1016/j.erap.2022.100762

Walden, A. and Thomas, J., 2025. *Unveiling the narrative around pilot mental health and aviation: A content analysis of FAA and mental health-related social media content. Collegiate Aviation Review International*, 43(1), pp. 19–35. Available at: https://ojs.library.okstate.edu/osu/index.php/CARI/article/view/9997/8944 [Accessed 21 Oct. 2025].

Wu, A.C., Donnelly-McLay, D., Weisskopf, M.G., McNeely, E., Betancourt, T.S. and Allen, J.G., 2016. *Airplane pilot mental health and suicidal thoughts: A cross-sectional descriptive study via anonymous web-based survey. Environmental Health*, 15(1), 121. https://doi.org/10.1186/s12940-016-0200-6