

A faded background image of two pilots in a cockpit. The pilot on the left is wearing a white shirt and a yellow tie, looking towards the right. The pilot on the right is wearing a white shirt and is looking forward. The cockpit is filled with various instruments and controls.

Evolving Research Related to Airline Pilot Mental Health

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Disclosures and Conflicts of Interest

- No relevant conflicts of interest
- ***Research funding*** from the US Department of Defense



3 Aug 2023

Good evening Dr Hoffman,

I'm in urgent need of some help as I'm dealing with a potential issue with the FAA regarding a medical matter and am having a hard time understanding and receiving advice. It is Neuro related and I had a recent exam that I thought had provided a resolution to my issue. It's becoming clear this may not be resolved and I would really like to speak with someone to try and mitigate that issue.



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24 Oct 2023

even longer. I'm not sure how I'm going to support myself for months without being able to work or how this is going to jeopardize my job. Do you happen to know anyone that might be of use to pull my packet and have it reviewed quicker? All of my exams came

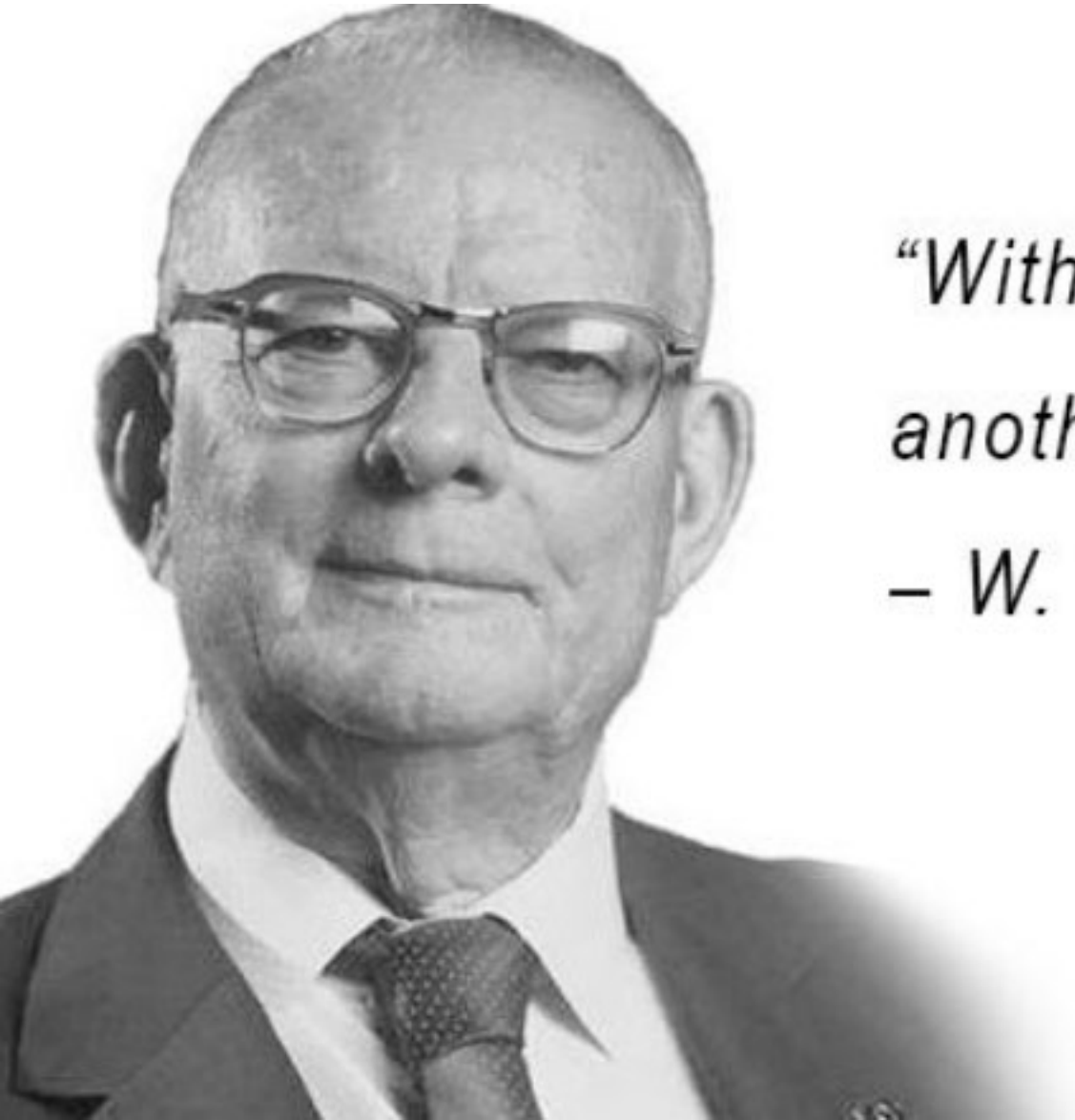


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*“Without data, you’re just
another person with an opinion.”
– W. Edwards Deming*

FLYING

Why Pilots Don't Want To Talk About Mental Health—and Why They Should

Pilots get anxiety and depression just like many other people do, but they seem less likely to seek support and treatment. Why? How can we change it?

**SCIENTIFIC
AMERICAN®**

MENTAL HEALTH | OPINION

We Need to Change the System That Keeps Pilots from Seeking Mental Health Care

As travel ramps up again, our data show that many pilots refuse to seek health care out of fear they will be pulled from flying

The New York Times

How to Screen Pilots and Protect Passengers

Airport
Technology

Features February 28, 2017

Addressing mental health issues among pilots

Pilot Mental Health, Methodologies, and Findings: A Systematic Review

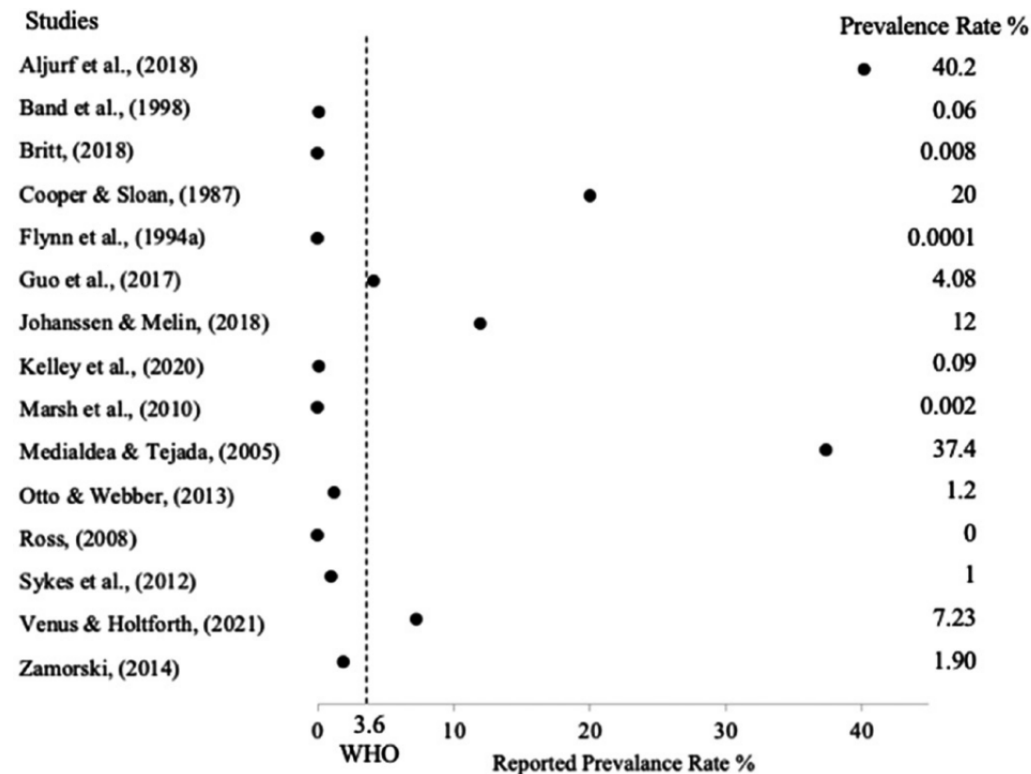
Corrie A. Ackland; Brett R. C. Molesworth; Jessica R. Grisham; Peter F. Lovibond

Rates of Pilot Anxiety

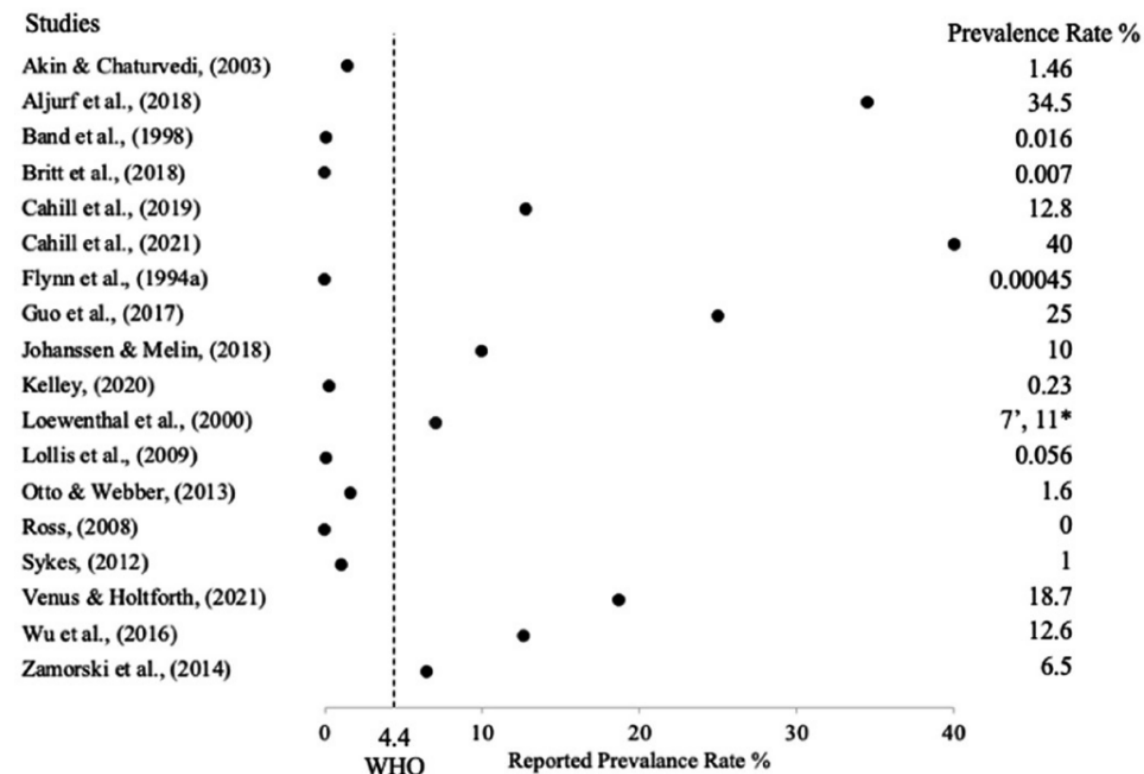
Rates of Pilot Depression

Pilot Mental Health, Methodologies, and Findings: A Systematic Review

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Rates of Pilot Anxiety



Rates of Pilot Depression



Breaking the Pilot Healthcare Barrier

William Hoffman; Elizabeth Bjerke; Anthony Tvaryanas

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Pilot healthcare barriers **are factors that impede healthcare seeking behavior** by individuals who hold a pilot certificate. These barriers include **perceptions about potentially negative consequences of new health information on future ability to perform piloting duties.**

➤ [Occup Med \(Lond\)](#). 2023 Sep 2;kqad091. doi: 10.1093/occmed/kqad091. Online ahead of print.

Multinational comparison study of aircraft pilot healthcare avoidance behaviour

W R Hoffman^{1 2}, P K Patel³, J Aden⁴, A Willis¹, J P Acker^{5 6}, E Bjerke², E Miranda¹, J Luster¹,
A Tvaryanas⁷

Affiliations [+ expand](#)

PMID: 37658781 DOI: [10.1093/occmed/kqad091](#)

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Occupational Medicine



Healthcare avoidance behavior

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Occupational Medicine



Healthcare avoidance behavior

n = 5,170 pilots

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Occupational Medicine



Healthcare avoidance behavior

US Pilots

56%

Canadian Pilots

55%

n = 5,170 pilots

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Occupational Medicine



Healthcare avoidance behavior

US Pilots

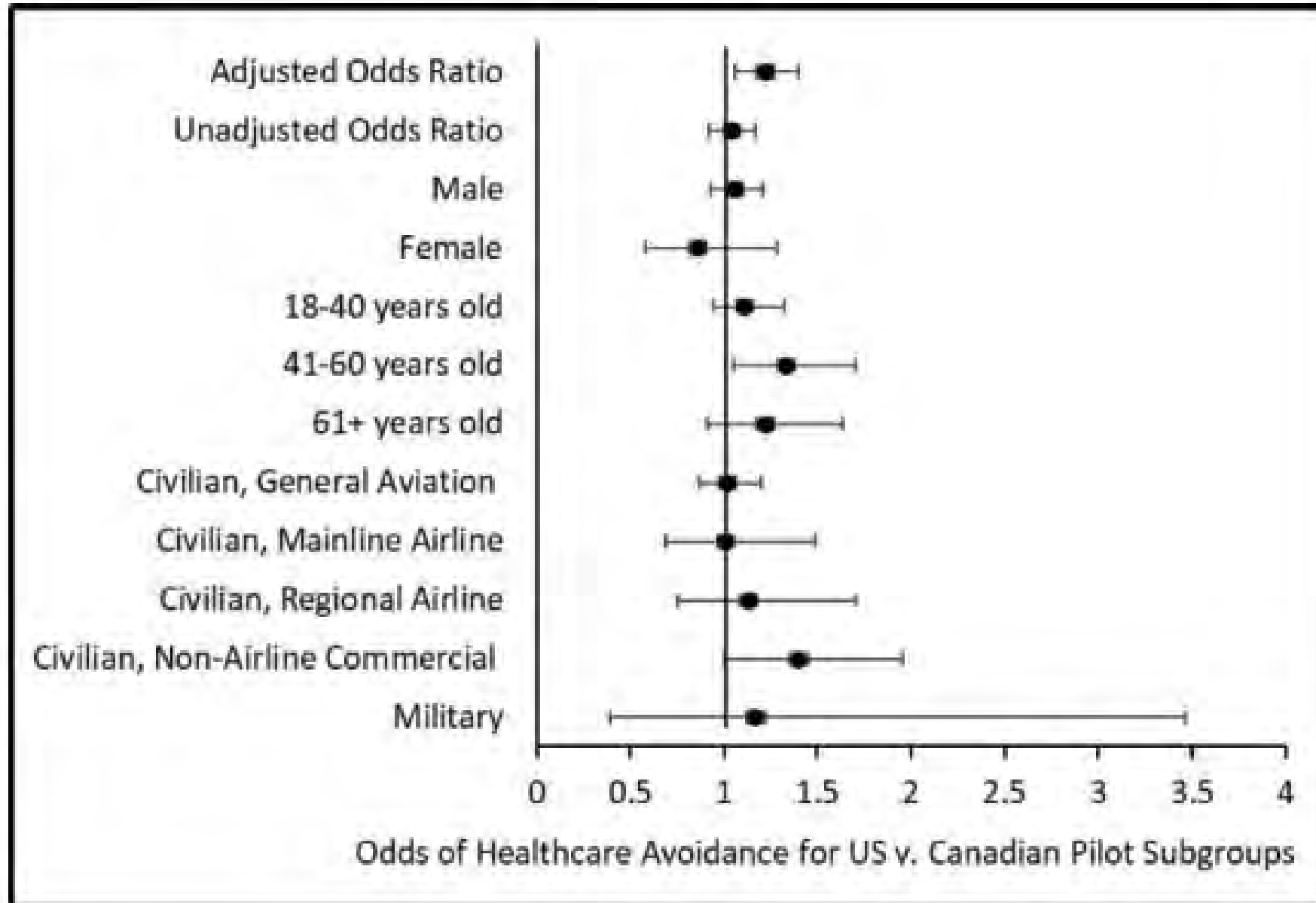
56%

Canadian Pilots

55%

n = 5,170 pilots

p = 0.58



➤ [J Occup Environ Med.](#) 2022 Apr 1;64(4):e245-e248. doi: 10.1097/JOM.0000000000002519.
Epub 2022 Feb 15.

Healthcare Avoidance in Aircraft Pilots Due to Concern for Aeromedical Certificate Loss: A Survey of 3765 Pilots

William R Hoffman ¹, James Aden, R Daniel Barbera, Ryan Mayes, Adam Willis, Parth Patel, Anthony Tvaryanas

➤ [Mil Med.](#) 2023 Mar 20;188(3-4):e446-e450. doi: 10.1093/milmed/usac311.

Self-Reported Health Care Avoidance Behavior in U.S. Military Pilots Related to Fear for Loss of Flying Status

William R Hoffman ¹, James K Aden ², Daniel Barbera ³, Anthony Tvaryanas ⁴

Affiliations + expand

PMID: 36242520 DOI: [10.1093/milmed/usac311](#)

➤ [Aerosp Med Hum Perform.](#) 2022 Aug 1;93(8):649-650. doi: 10.3357/AMHP.6063.2022.

Breaking the Pilot Healthcare Barrier

William Hoffman, Elizabeth Bjerke, Anthony Tvaryanas

PMID: 36050857 DOI: [10.3357/AMHP.6063.2022](#)

➤ [J Occup Environ Med.](#) 2023 Jun 1;65(6):e413-e417. doi: 10.1097/JOM.0000000000002838.
Epub 2023 Mar 14.

Health Care Avoidance Among Canadian Pilots Due to Fear of Medical Certificate Loss: A National Cross-Sectional Survey Study

Parth K Patel ¹, William R Hoffman, James Aden, Jason P Acker

Affiliations + expand

PMID: 36914380 DOI: [10.1097/JOM.0000000000002838](#)

➤ [J Occup Environ Med.](#) 2019 Sep;61(9):e401-e405. doi: 10.1097/JOM.0000000000001662.

Pilots' Healthcare Seeking Anxiety When Experiencing Chest Pain

William Hoffman ¹, Nikhil Chervu, Xue Geng, Aykut Üren

Affiliations + expand

PMID: 31306268 DOI: [10.1097/JOM.0000000000001662](#)

➤ [Arch Environ Occup Health.](#) 2022;77(3):234-242. doi: 10.1080/19338244.2021.1873093.
Epub 2021 Feb 3.

Healthcare related aversion and care seeking patterns of female aviators in the United States

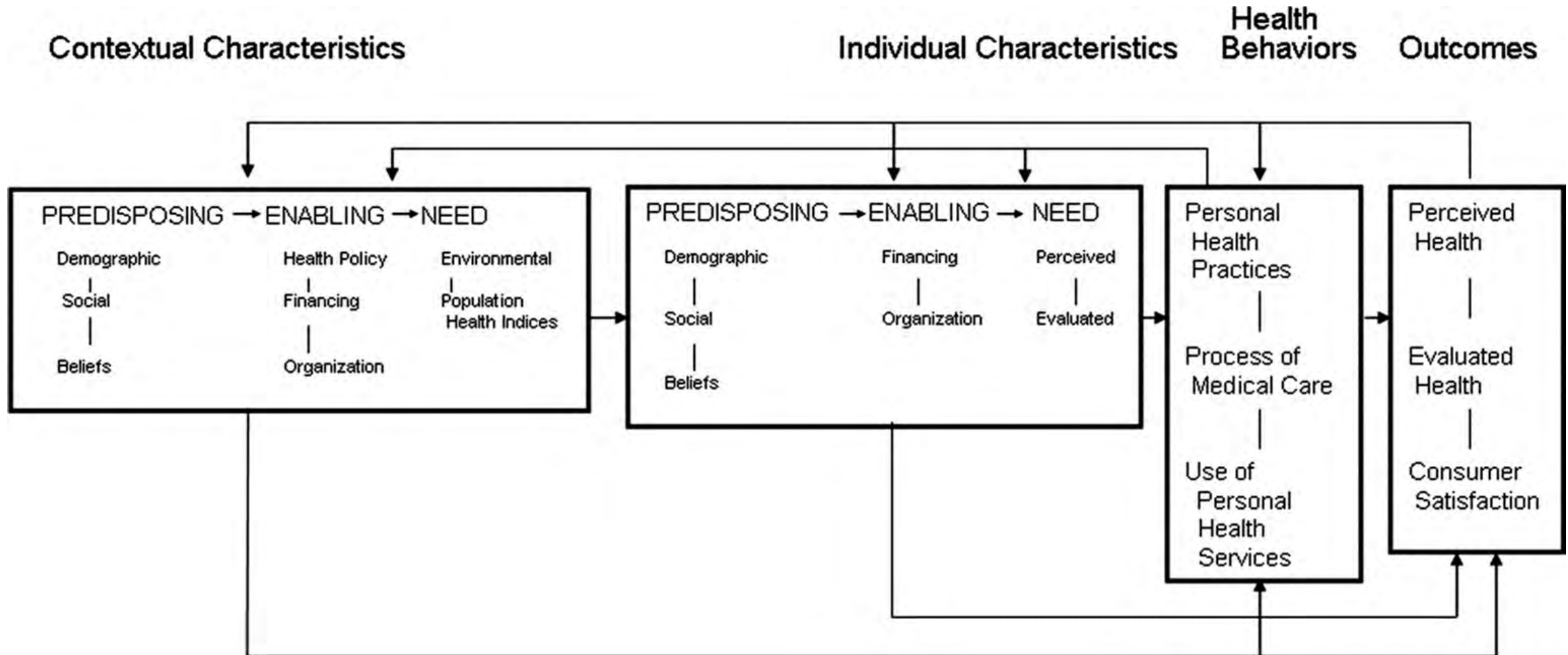
William R Hoffman ¹, R Daniel Barbera ², James Aden ³, Matthew Bezzant ¹, Aykut Uren ⁴

Affiliations + expand

PMID: 33533702 DOI: [10.1080/19338244.2021.1873093](#)

What are the **factors** that **influence**
healthcare **utilization** and health
information **disclosure** in pilots?

Andersen Healthcare Utilization Model



Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav. 1995; 35(1):1-10.

Pilot Mental Healthcare Avoidance and Information Non-Disclosure within the Safety Management System

**William R. Hoffman, MD¹; Rachael N. Martinez, PhD²; Nicole Devlin, MS³;
Tanya M. Goodman, MS³; TSgt Christopher Thompson²; Anthony Tvaryanas,
MD, PhD, MPH&TM⁴**

¹Department of Neurology, Brooke Army Medical Center, TX; ²Aeromedical Operational and Clinical Psychology, U.S. Air Force School of Aerospace Medicine, Wright-Patterson AFB, OH; ³NeuroStat Analytical Solutions, LLC, Great Falls, VA;

⁴Civil Aerospace Medical Institute, Federal Aviation Administration, Oklahoma City, OK

Key Takeaways from this study

1) **Key Factors** influencing subpopulations



Key Takeaways from this study

- 1) **Key Factors** influencing subpopulations
- 2) **Peer Support** as the **Glue**



Key Takeaways from this study

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- 3) **Who Owns What?**



Methods

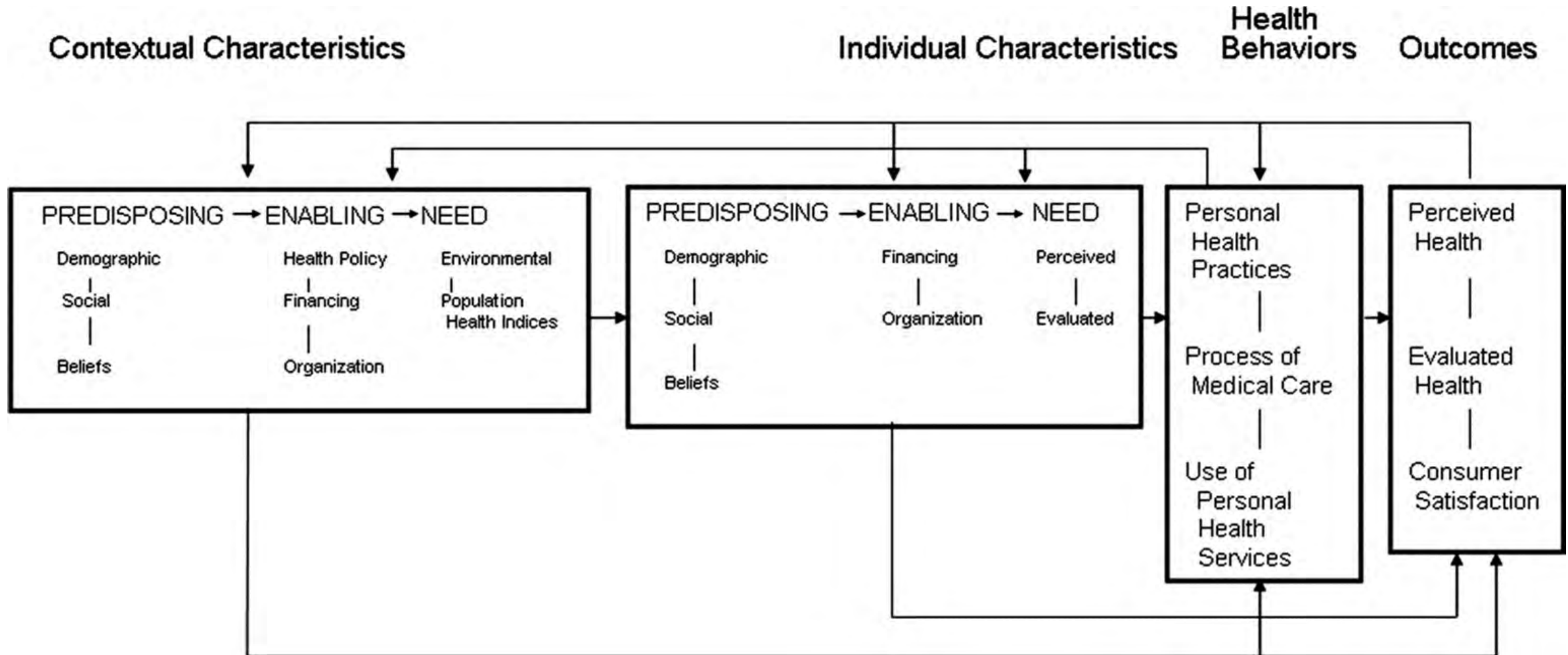


- **Sample:** N = 36 commercial pilots
- Semi-structured interviews lasting 30-35



Interviews were audio-recorded and transcribed, resulting in **268 pages** of transcripts.

Andersen Healthcare Utilization Model



Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav. 1995; 35(1):1-10.

Methods: Semi-Structured Interview Questions



What factors might influence a pilot's decision on whether to disclose a new mental health or physical symptom/condition during aeromedical screening?



What factors do you think influence the decision of a pilot to use or not use mental healthcare services and physical healthcare services?



How might pilots navigate a situation where they are experiencing a 1) new mental health symptom or condition or 2) new physical health symptom or condition?



What factors are modifiable in the current aeromedical system that could encourage pilot healthcare utilization and disclosure?

Results: Top Factors that Discourage Disclosure & Utilization

Medical revocation	Extent to which pilots fear reporting a condition to the FAA or their doctor and potentially losing their license/medical certificate (temporarily or permanently).
Policy misinformation and lack of education	Extent to which pilot's knowledge is based on their own perception of legalese in FAA policies and/or other pilots' interpretations of FAA policies.
Stigma	Extent to which pilots fear the social and occupational impact that seeking MH care has on them as individuals (e.g., embarrassment).
FAA processing timeframe	Extent to which pilots are concerned about being grounded during the timeframe for the FAA to process paperwork and determine if/when they will approve their medical certificate or special issuance.
Healthcare-related costs	Extent to which the pilot's company insurance does not cover expenses related to seeking healthcare services (e.g., out of pocket costs).

Results: Top Factors that Encourage Disclosure & Utilization

	Definition
Peer support services	Extent to which pilots may be more likely to share their personal problems with pilots by utilizing the organization's peer support platform.
Company support	Extent to which pilot's company supports using healthcare providers and insurance.
Union embedded medical resources	Extent to which pilots value having access to a union-sponsored medical office in house because the AME understands the FAA requirements and processing (e.g., know what the FAA packet is supposed to look like) and maintains confidentiality.


Recommendations from Commercial Pilots (most reported to least reported)

Normalization of care-seeking behaviors
Education about FAA guidelines
Expedite FAA processing timeframe
Update FAA administrative processes
Expanded FAA list of medications
Improve aeromedical screening
Offer wellness checks
AME quality assurance
Health-awareness resources
Expand peer support services
Increase awareness on non-cisgender needs

Optimize schedules
Modernize long-term disability policies
Expand maternity and lactation policies
Company incentivize wellness
Adjust disability policy
Women's health related to certification
Consistency in certification decisions
Medical advice from aeromedical physician
Transitional return to flight status
Adjust company time-off policy


How Can the Regulator Address Pilot Mental Healthcare Avoidance?

An Action-Focused Summary

	IDENTIFIED GAP	PROPOSED CONTROL MEASURE	STUDY PARTICIPANT QUOTE
	<p>Policy Confusion</p> <p><i>“Pilots don’t understand the medical standards rules.”</i></p>	<p>Clear aeromedical certification and policy information made accessible to pilots. Potential methods include phone-based apps, website, podcast, etc.</p>	<p><i>“Sometimes it is unknown what types of treatments or issues may raise alarms for the FAA, so sometimes people will rather not seek care if it means they can’t fly.”</i></p>

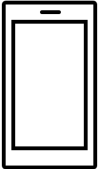
How Can the Regulator Address Pilot Mental Healthcare Avoidance?

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	<p>Uncertainty Navigating Certification</p> <p><i>“Pilots don’t understand how to apply for Special Issuance.”</i></p>	<p>FAA publishes best practices for organizations to aid pilot members navigating aeromedical certification (i.e., embedded AME or related role).</p>	<p><i>“As a union member, I can reach out to [the union AME] and they answer medical questions. If you fill something out incorrectly, there’s the fear that they might take your medical or think that you’re trying to hide something from them.”</i></p>


How Can the Regulator Address Pilot Mental Healthcare Avoidance?

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	IDENTIFIED GAP	PROPOSED CONTROL MEASURE	STUDY PARTICIPANT QUOTE
	FAA Processes, Communication, and Timing <i>"It all comes back to medical revocation and control."</i>	Clear messaging about the steps and timing of application process; interactive portal with application status updates; transparency between AME and pilot; disposition consistency.	<i>"I think modernizing how things are reported would be a big help, not having to every year say I had seasonal allergies previously reported, no changes."</i>


How Can the Regulator Address Pilot Mental Healthcare Avoidance?

An Action-Focused Summary

	IDENTIFIED GAP	PROPOSED CONTROL MEASURE	STUDY PARTICIPANT QUOTE
	<p>Mental Health Culture, Literacy, and Safety</p> <p><i>"Pilots are afraid to seek help."</i></p>	<p>FAA publishes best practices for mental wellness programs and policies within pilot organizations, best practices for peer support programs.</p>	<p><i>"[The peer support program] shows them where to get mental health through the EAP program that will give them 6 or 8 sessions free...we just make sure they know how to access the resources that they have."</i></p>

How Can the Regulator Address Pilot Mental Healthcare Avoidance?

An Action-Focused Summary

	IDENTIFIED GAP	PROPOSED CONTROL MEASURE	STUDY PARTICIPANT QUOTE
	Concerns about Financial Loss <i>"If I can't fly, how will I pay my mortgage?"</i>	FAA publishes best practices for pilot organization disability programs and related medical leave programs.	<i>"I'll speak from personal experience. I've spent close to almost \$15,000 to get my medical back, whether that be with psych assessments or therapy just to figure out general things."</i>

Key Takeaways from this study

1) **Key Factors** influencing subpopulations



Self-Reported Health Care Avoidance Behavior in U.S. Military Pilots Related to Fear for Loss of Flying Status

*Capt William R. Hoffman, MD, AME, USAF, MC *; James K. Aden, PhD†; Capt Daniel Barbera, MD, USAF, MC‡; Anthony Tvaryanas, MD, PhD, MPH, TM§*

ABSTRACT

Introduction:

U.S. military pilots are required to meet certain medical standards in order to maintain an active flying status. Military pilots face potential temporary or permanent loss of flying privileges in the setting of a new condition or symptom that does not meet required standards, which could result in negative social and occupational repercussions for the pilot. For this reason, it has been proposed that U.S. military pilots participate in health care avoidance behavior, but little evidence exists to characterize such a trend in this population.

Materials and Methods:

We conducted a non-probabilistic Internet survey of the general population of U.S. pilots from November 1, 2019 through August 1, 2021. The current study is a sub-analysis of military pilots.

Results:

A total of 4,320 pilots answered the informed consent question, and 264 selected one military pilot type and were included in this sub-analysis. There were 72% of military pilots who reported a history of health care avoidance behavior ($n = 190$), and no statistical difference was found between age groups, gender, and military pilot types. There were 55.5% of pilots who reported a history of seeking informal medical care ($n = 147$), 33.7% of pilots who have flown despite a new symptom they felt required medical evaluation, 42.5% of pilots who reported withholding information on aeromedical screening ($n = 111$), and 11.4% of pilots who reported a history of undisclosed prescription medication use ($n = 30$).

Conclusions:

U.S. military pilots may participate in health care avoidance behavior because of fear for loss of flying status.





Self-Reported Health Care Avoidance Behavior in U.S. Military Pilots Related to Fear for Loss of Flying Status

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U.S. military pilots may participate in health care avoidance behavior because of fear for loss of flying status.

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Recommendations and Next Steps

1. Establish a multidisciplinary working group **inclusive of potential control owners/implementers** to determine initial (uncontrolled risk), residual (controlled) risk, associated cost, and **best practices and next steps**.



Working group

Recommendations and Next Steps

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 - a. How might we **modify factors** identified in this study **to lower barriers to care and increase health information disclosure?**



Working group

Recommendations and Next Steps

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Working group



Recommendations and Next Steps

2. **Publications of pilot success stories** navigating the aeromedical screening system



USAF photo by SSgt Betty Chevalier

Recommendations and Next Steps

3. **Educational initiatives related to mental health policies** directed to relevant stakeholders (i.e., AMEs, pilots, pilot organizations, etc.)



What are the data need to address barriers, guide peer support and build mental wellness efforts...



...into the aerospace system of the future?



HULTONGETTY



Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomised controlled trials



Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials

Gordon C S Smith, Jill P Pell

Abstract

Objectives To determine whether parachutes are effective in preventing major trauma related to gravitational challenge.

Design Systematic review of randomised controlled trials.

Data sources: Medline, Web of Science, Embase, and the Cochrane Library databases; appropriate internet sites and citation lists.

Study selection: Studies showing the effects of using a parachute during free fall.

Main outcome measure Death or major trauma,

accepted intervention was a fabric device, secured by strings to a harness worn by the participant and released (either automatically or manually) during free fall with the purpose of limiting the rate of descent. We excluded studies that had no control group.

Definition of outcomes

The major outcomes studied were death or major trauma, defined as an injury severity score greater than 15.⁶

Meta-analysis

Our statistical approach was to assess outcomes in para-

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Jill P Pell
consultant

A call to (broken) arms

Only two options exist. The first is that we accept that, under exceptional circumstances, common sense might be applied when considering the potential risks and benefits of interventions. The second is that we continue our quest for the holy grail of exclusively evidence based interventions and preclude parachute use outside the context of a properly conducted trial. The dependency we have created in our population may make recruitment of the unenlightened masses to such a trial difficult. If so, we feel assured that those who advocate evidence based medicine and criticise use of interventions that lack an evidence base will not hesitate to demonstrate their commitment by volunteering for a double blind, randomised, placebo controlled, crossover trial.

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What are the data need to address barriers, guide peer support and build mental wellness efforts...



...into the aerospace system of the future?

Recommendations and Next Steps

Aerospace Medical Association Mental Health (AsMA) Research Working Subgroup



- 50+ Members
- 7 ICAO Countries Represented

