The Effects of Simulated Hearing Loss on Aviator Performance and Cognitive Workload during Simulated Flight

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Army aviators require a level of hearing acuity to communicate in high operational tempos, which includes the use of multiple radios while performing flight operations. Military operations, including rotary-wing aircraft noise, present short-term risks to the communication abilities of Army aircrews and long-term risks to aviator hearing health in the form of hearing loss, which can be temporary or permanent. Hearing loss can render an aviator more susceptible to the adverse effects of degraded communication signal quality and consequently lead to an increased allocation of mental resources to hear, referred to as ‘listening effort.’ Army aviation hearing standards, which are primarily based on pure tone testing and speech recognition scores in quiet, do not necessarily predict the functional impact of hearing loss. Given this, the current study aimed to first determine the scope of hearing loss in Army aviators over the past five years and analyze the impact of current threshold requirements on in-flight performance data from pilots presented with simulated hearing loss.

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Background

Aviators face several challenges when listening to communications during flight. Aircraft are extremely loud environments. Multiple radio and internal communication channels are continually monitored. Understanding the hearing requirements needed in the aircraft can help identify and improve fitness-for-duty standards and guide aircraft communication systems design.

Scope of Hearing Loss in Army Aviators

- Quantify the scope of hearing loss in Army aviators over the past five years
- ADOHRS and AERO databases query and analysis of hearing loss in aviators according to current Army Readiness Standards and Aeromedical Policy Letters.

Results

- Simulated hearing loss decreased all speech scores and increased the fail rate on the Modified Rhyme Test (MRT).

Methods

Participants: 21 Army aviators (age criteria 19-59) with over 200 flight hours
- Audometric thresholds ≤25 dB HL at all frequencies tested in both ears.
- Currently on flight status (20 UH-60 and 1 AH-64).

Conclusions

More could be done to ensure aviators are operationally capable and mission-ready with the hearing loss they have.
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