INTRODUCTION

Older adults face a number of multifaceted challenges, such as:
- Impaired hearing with 40% of people over the age of 50, and 71% of people over the age of 70 hearing hearing impairment (1).
- Cognitive decline making an average older adult’s cognitive performance similar to that of sleep-deprived younger adults (1).
- Sleep-wake cycle disruption as affecting as many as 50% of them (1).

Unforeseen consequences may arise when such challenges occur together.

RESEARCH QUESTIONS

I. How are wellbeing and the ease and effectiveness of communication affected by factors that may use up or deplete cognitive resources such as sleep deprivation, ageing, and hearing loss, individually and additively?
II. Is that effect mediated by the role of cognitive resources?

METHODS

- 3 experiments will be conducted, isolating the individual and additive effects of sleep quality, age, and hearing on the outcome variables: listening effort, fatigue, discourse comprehension, cognitive resources, and overall wellbeing.
- 3 samples will be selected from younger adults, older adults, and adults with hearing impairment.
- The outcome variables will be measured in each of these three samples and calculated using within-group and between-group analyses.
- The outcome variables will be assessed again after the hearing-impaired sample receives hearing aids.

EXPECTED RESULTS

- Power sleep, older age, and hearing impairment conditions are expected to negatively affect cognitive resources, especially when they are co-occurring.
- A decline in cognitive resources is expected to reflect poorly on listening effort, fatigue, discourse comprehension, and overall wellbeing.
- Adding hearing is expected to free up cognitive resources, and reflect positively on the other outcome variables, and possibly indirectly improve sleep.

IMPLICATIONS

If the additive effects of the coexistence of multiple depleters are observed in the depletion of cognitive resources, which in turn is associated with poor outcomes, then a new model of cognitive resource depletion will be explored and expanded with other potential depleters.

A PILOT STUDY

A total of 72 participants completed the entire experiment. The sample was slightly skewed towards younger, better sleeping and better hearing.

- Vigilance: no significant correlations with independent variables.
- Orienting Attention: no significant correlations either.
- Executive Attention: an approaching significance small correlation with age when controlling for the effect of hearing.
- Alerting Attention: significant correlation with aging and hearing impairment when controlling for the effects of each other.
- Overall RTs: significant correlation with age controlling for hearing.
- MLR of the predictors Age and Hearing on Alerting Attention: significant, explaining 15.91% of the variance in Alerting Network

CONCLUSIONS

- In this sample, the alerting attention is correlated with two of the independent variables, whereas the executive attention is correlated with one, and so is the overall RT.
- The older the age, the significantly longer the RT, and the less effective the cueing, as seen in similar studies.
- The older the age, the significantly longer the time it takes for conflict resolution, indicating a decline in executive control, also seen in other studies.
- Hearing and Age together have a significant moderate effect on the Alerting Network efficiency.

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REFERENCES