12-2021

Improving Senior Fitness Programs & Dementia Care (Canadian Centre for Activity & Aging)

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Canadian Centre for Activity and Aging CEL Project

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Introduction

- Dementia is a group of neurodegenerative diseases that impair cognitive functioning such as memory, thinking and social abilities. Some risk factors cannot be changed such as age and family history. However, risk factors such as diet and exercise can be modified.
- With Canada's aging population, the prevalence of dementia is rising, as dementia is a disease of old age. The rates of dementia are also increasing as dementia risk factors such as obesity, diabetes, and a generally sedentary lifestyle in the elderly population are becoming more common in society.
- Exercise has been shown to improve the cognitive function and memory of dementia patients and can reduce the risk of dementia. Physical activity, especially aerobic exercise, increases the blood flow to the brain thereby stimulating both brain cell growth and survival (Ahlskog et al., 2011).
- As there are no current cures for dementia, there is a need for research on measures that prevent the development or slow the progression of dementia in seniors.

Project Aims

Our project had three goals that each corresponded to one of our deliverables. Our aims were:

1. Determine the modifiable risk factors of dementia and creatively present them in a visual image
2. Provide feedback for the weekly senior fitness classes
3. Assist with and provide feedback for the functional fitness assessment

Methods

1. Review literature to determine the modifiable risk factors of dementia and their relative significance
   - Represent these using a visual image generator
2. Observe and assist with weekly senior fitness classes
3. Conduct the functional fitness assessments for 34 seniors:

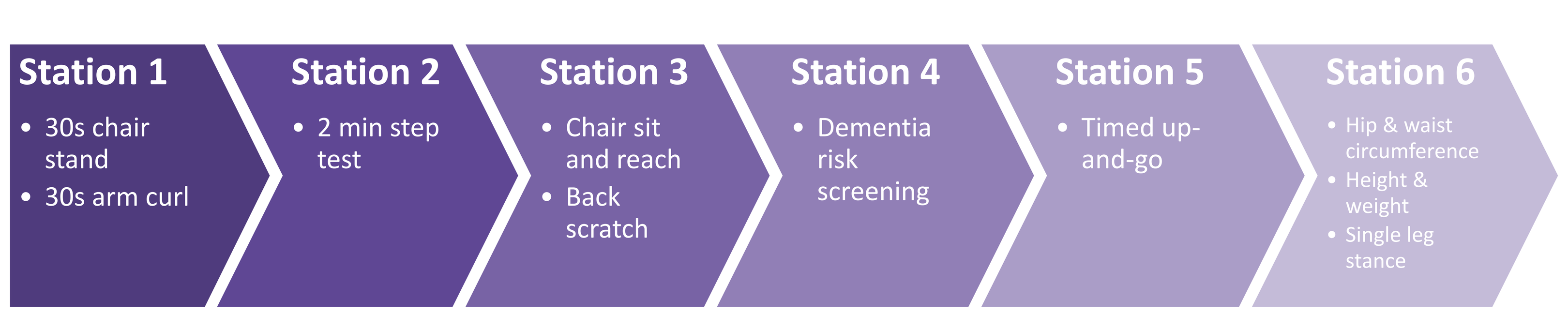

Figure 1. The fitness assessments performed at each of the six stations

4. Present findings in the form of an infographic

Results & Deliverables

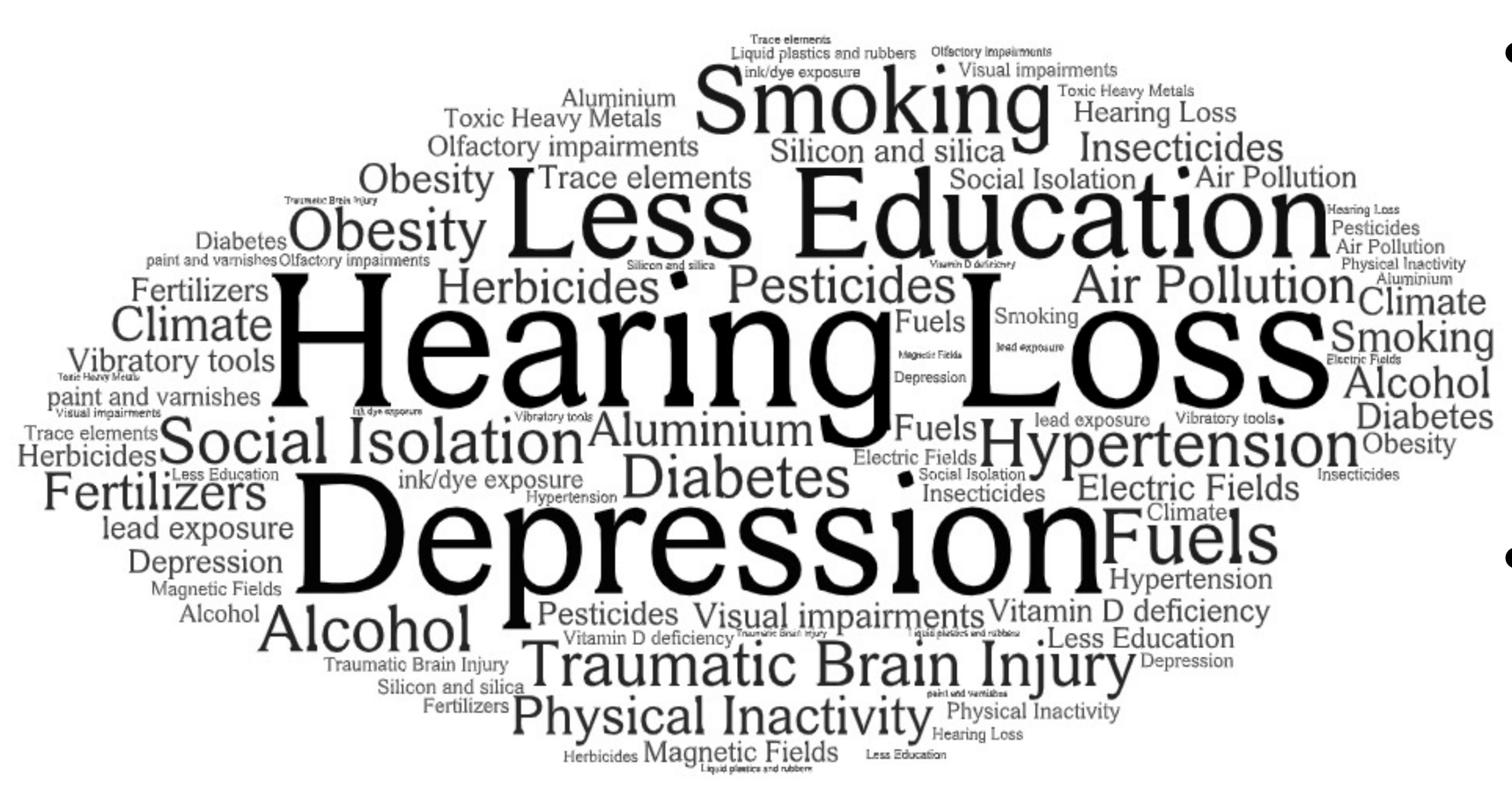

Figure 2. A Wordle representing the relative significance of various modifiable risk factors of dementia.

- Our first deliverable was a Wordle that will be used to educate the public about the modifiable risk factors of dementia
- According to Livingston et al. (2020), the most important modifiable risk factors of dementia are hearing loss, low education status, depression, and smoking.
- Our second deliverable was an infographic that will provide the CCAA's management team with an overview of what we did this term as well as some recommendations for improving each component.

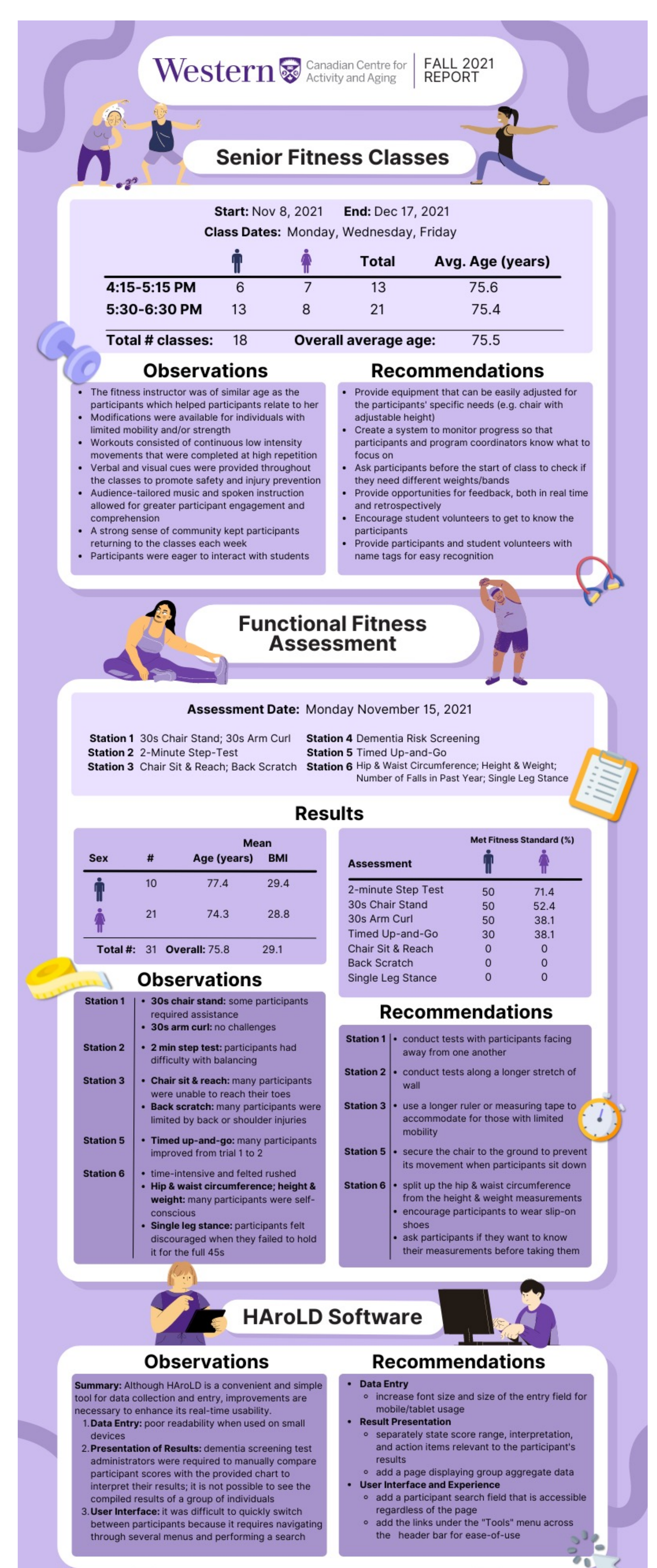

Figure 3. An infographic to report observations and share feedback from the CCAA's senior fitness classes and functional fitness assessment.

SENIOR FITNESS CLASSES

- Workouts consisted of low intensity bodyweight movements and exercises involving exercise balls, resistance bands and dumbbells.
- Some modifications were available for individuals with limited mobility
- Age-appropriate music and language helped engage participants.

FUNCTIONAL FITNESS ASSESSMENT

- Time requirement was not evenly distributed among stations – station 6 required significantly more time.
- Participants had the most difficulty with the Timed Up-and-Go, 30-second Arm Curl, 30-second Chair Stand, and 2-minute Step Test.
- Compared to female participants, male participants were less likely to meet fitness standards for the 2-minute Step Test (71.4% vs. 50%), 20s Chair Stand (52.4% vs. 50%), and the Timed Up-and-Go (38.1% vs. 30%).

HAroLD SOFTWARE

- Simple and straightforward to use but the user interface made data collection in real time challenging.
- Test administrators must manually compile fitness assessment data and interpret dementia screening results.

Impact

- By 2036, the 65 and older population in London Ontario is expected to grow to 22.5% (Age Friendly London, 2015). Our project will have widespread effects because the growing senior population means that there will be a greater need for preventative and therapeutic measures against both mental and physical deterioration.
- Greater awareness of the modifiable risk factors of dementia may serve to reduce health-harming behaviours such as smoking and alcohol consumption. This effect will not only decrease dementia risk but also reduce the burden that these behaviours place on the health care system.
- The CCAA's fitness classes help seniors maintain an active and healthy lifestyle while also fostering a sense of community. The CCAA's functional fitness assessment works alongside these classes to provide both seniors and researchers with concrete information about individual fitness levels, thereby allowing them to identify general trends and areas for improvement.
- Therefore, by compiling the fitness assessment results with our observations, we can provide evidence-based recommendations for future classes and assessments. Improvements in these areas serve to enhance not only the in-class experience but also the daily functioning of participants.
- Our findings were not concordant with existing literature, which indicated that at old age, men tend to have higher functioning than women (Carmel, 2019). However, this may have been observed because on average, male participants were older than the female ones.

Future Directions

SHORT TERM: The recommendation manual for the HAroLD interface can be transitioned into a software updating project, where the manual points can be applied to the system development. Future student groups can edit the interface and continue the research into improving the data base and its usability and efficiency.

LONG TERM: The Wordle can be used in future research projects conducted by the CCAA as a component of their study or as a visualization image in a research campaign or online course.

LIMITATIONS: Our current recommendations are based on our personal experiences and may not be generalizable to every user of HAroLD. Future research on the system with a diverse user group is needed to make concrete conclusions. Additionally, the Wordle is based off our personal perceptions on severity informed by literature, so future groups are needed to ensure our choices are accurate.

Literature and Acknowledgements

Thank you to Dr. Sarah McLean, John David Sardido, and Kevin McIntyre for their guidance, as well as the CCAA staff (Dr. Orange, Steve Di Ciacca, and Shannon Belfry) for their cooperation and collaboration.

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