Knowledge Exchange Seminar Series (KESS)

...is a forum that encourages debate on a wide range of research findings, with the overall aim of promoting evidence-based policy and law-making within Northern Ireland

Gray Matters Study
The Empowering role of smartphones in Behaviour Change Interventions

Prof. Chris Nugent, Dr. Ian Cleland, Prof. Sally McClean.
There is currently no cure and research is now focusing on identifying modifiable risk factors and prevention methods.
Prevention in Public Health

Actions

• Encouraging healthy behaviors
• Integrating risk reduction prevention policies
• Raising awareness of risk
• Producing information on reducing the risks
• Delivering services to promote behavior change

Who is the focus?

• Adults aged 40–64 years
• A particular focus on people at increased risk of developing dementia
• Those with unhealthy behavior and lifestyle.
Risk of Alzheimer's Disease

Modifiable Behavioural Factors

Non-Modifiable Risk Factors

Environment / Cultural Factors

Reduced Risk


1/3 of Alzheimer's disease cases may be attributed to potentially modifiable risk factors*

What's good for the _heart_ is good for the _brain_!

Modifiable factors may include:

1. Increase Physical activity
2. Eat healthier
3. Improve sleep quality
4. Become more socially active
5. Reduce Stress
6. Increase cognitively stimulating activity
7. Reduce alcohol consumption
8. Reduce smoking
The Gray Matters App

- Provides a daily factoid and suggestion pair
  - Gives users a short snippet of text based on health literature about Alzheimer’s disease. It then suggests a lifestyle change that could improve the likelihood of preventing AD.

- Facilitates user data entry to enable lifestyle tracking
  - Users answer 12 preset questions aimed to assess performance across 6 behavioral domains.

- Provides real-time performance feedback
  - Based on the users’ answers, they are provided with visual feedback in the form of a 5 star rating for each domain. They can also see a weekly summary of their efforts.

Aims to *lessen* the risk of developing *Alzheimer’s disease* through *behavior change*.
Just another App?

• Apps are limited by quality, inaccurate information and an absence of evidence-based content.

• Lack of user and clinician engagement during their development.

• Many apps do not contain theoretically behavior change techniques.

• Few apps comply with regulatory processes & have had their effectiveness assessed.

• Leading to concerns about lack of benefit or even potentially harmful apps.
The Team
Multi-disciplinary & Intersectoral

Technical
Sally McClean
Statistics
Chris Nugent
Pervasive Computing
Ian Cleland
Wearable Technologies
Phillip Hartin
Software design

Clinical
Maria Norton
Dementia Epidemiology

Business
Cristiano Paggetti
Business Development

Multi-disciplinary & Intersectoral
Underpinned by Research

Behavioural models

- Help cope/ recover from relapse
- Identify/ prevent potential relapse
- Motivate them to sustain a change
- Help set achievable goals to make change

- Pre-contemplation: No intention to change
  - Increase awareness of need for change
  - Encourage plan making for needed change
  - Help develop action plans

- Contemplation: Aware a problem exists but with no commitment to action
  - Encourage them to make a change

- Preparation: Intent to take action to address problem
  - Help develop action plans

- Action: Active modification of behaviour
  - Help develop action plans

- Maintenance: Sustained change; new behaviour replaces old
  - Assist w/ problem solving, reinforcement

- Relapse: Fall back into old patterns of behaviour
  - Assist w/ coping, healthy alternatives to avoid relapse

- Upward Spiral: Learn from each relapse
  - Assist w/ problem solving, reinforcement

- Increase awareness through monitoring and education.
Ensuring Scientific Rigour Through Peer Review

Detailed assessment of health related apps in order to insure that both the app and the educational content was of high quality.
Scientifically Evaluated

146 participants recruited

- 104 assigned to treatment group
- 42 assigned to control group

Trialled in for 6 months

Intervention included app and wearable

Intervention Program
To provide health education that summarised evidence-based lifestyle recommendations.

Smartphone App
To deliver educational material, encourage engagement and track lifestyle behaviors.

Activity Monitor
Provided with a wearable wrist worn activity monitor - Nike Fuelband SE (donated by Nike)
Results Summary

• Everyone who used the app showed *adoption of new, healthy behaviors* compared to those who did not.


• The *more* often the app was launched, the *greater* the change.

• Those who used the app everyday showed the *greatest change*. 
Feedback from Users

I love the app. I look at it almost every night...I found it very helpful and I love the tips.

Having that reminder every day made me consciously try to adopt those behaviors.
Other Findings
Sustained engagement

Number of responses per week

Week Number

Number of responses

- Novel Mental
- Nuts
- Social
- Cog Stimulating
- Moderate Phys
- Fruit and Veg
- Vigorous Phys
- Stress Effort
- Stress Rate
- Sleep
- Whole Grains
- Fuel points
Future work with GM

Improve the effectiveness of the solution through increased intelligence.
Technology as a Facilitator

- Instant Accessibility
- Rapid Spread of information
- Highly interactive and engaging
- Reach large diverse audience
- Sharing of knowledge and experiences
- Social Support
- Highly Personalised
- Maintain Anonymity
Summary

• We need to implement risk reduction/ prevention strategies specifically for dementia.
  • This includes raising awareness of the impact of modifiable lifestyle factors

• The interventions should be multi-domain

• They should be tailored for various population/ cultural backgrounds as well as personalised specifically for the individual

• Technology is a key facilitator to reaching large, diverse populations

• We should seek to leverage technology within public health particularly for behaviour change interventions
Questions

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