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Seminar Medical Informatics
mHealth Workshop



Dementia in Numbers



Dementia in Numbers

44 million



2003

...2X every 20 years



Dementia in Numbers

76m by 2030

136m by 2050



Dementia in Numbers

Estimated annual worldwide cost of dementia was:

\$604B in 2010





6 per year!

Background

- No known cure!
- Major public health priority by the
G8 Dementia Summit & WHO



Background

- The **CAIDE** (Cardiovascular Risk Factors, Aging, and Incidence of Dementia) Dementia Risk Score was developed to identify individuals at increased risk for dementia.
- This risk score is based on risk factors such as:
 - Age
 - Hypertension
 - High cholesterol
 - Physical inactivity
 - Obesity
 - Educational level



CAIDE Risk Score Study

- The intervention consisted of nutritional guidance, exercise, cognitive training, and monitoring of risk factors.
- Participants: with risk factors present and cognitive performance at mean or lower.
- When participants were subjected to an intensive lifestyle intervention for 2 years, there was a significant beneficial effect on global cognition score:
 - The score in the intervention group was 25% higher than control group.
 - The risk of cognitive impairment was 31% higher in the control group compared to the intervention group.



More findings

These findings indicate that the CAIDE Dementia Risk Score is an extremely valuable tool for detecting individuals at high risk for dementia, who are also likely to benefit from lifestyle interventions.

Important: Most of the risk factors for dementia and cognitive decline are modifiable!





CAIDE Dementia Risk App (*Dementia Risk Tool*):

- Assess the 20-year risk of developing dementia.
- Inform users about the meaning of their risk score through a graphic display.
- Provide users with guidance and suggestions for methods to decrease their score.
- Recommend users to consult with a health care practitioner (if needed).



Methods



Dementia Risk Tool

RISE SICS

Medical



CAIDE Dementia Risk Score APP:

- To develop the CAIDE Risk Score App, the authors worked with Merz Pharmaceuticals Germany.
- Users are asked to enter age, sex, height, weight, cholesterol level, blood pressure, physical activity, and years of education.

Let's see!

Risk score	
0-5	1 %
6-7	1.9 %
8-9	4.2 %
10-11	7.4 %
12-15	16.4 %



Explanation - beginning

Dementia Risk Tool



The Dementia Risk Tool mobile app allows you to get an estimate of your risk of developing dementia in the future.

The app will pose a series of questions concerning factors that affect the risk, and then calculates a risk score based on your answers. It will also give you advice on how you can lower the risk via lifestyle changes.

Please note that the calculated risk is not an absolute prediction for a single individual as there are other factors as well. Although the risk tool app is based on studies with participants aged 40 and over, the risk score results can also apply to younger adults.

MULTI-MODE

The Dementia Risk Tool was developed within the EIT-funded MULTI-MODE project. The project partners are Karolinska Institute (Sweden), RISE (Sweden), Imperial College London (UK), Parc Sanitari Sant Joan de Deu (Spain) and Erasmus University Medical Centre Rotterdam (the Netherlands).



The Dementia Risk Tool uses for instance the Cardiovascular Risk Factors, Aging, and Incidence of Dementia (CAIDE) risk score model to predict the risk of developing dementia in the future among middle aged and elderly people (see reference).

Contribute to research

Using the Dementia Risk Tool you can also contribute to research by allowing us to anonymously collect and analyse your answers to the app's questions. If you give your consent below, your answer data will be sent to a secure scientific database, where it can be accessed and analysed by RISE scientists.



I agree that my answers are collected, stored and analysed anonymously for scientific purposes according to our Privacy Policy.

Visualization

The first five screens of the app are input forms for personal data:

- How old are you?**: A slider set to 25 with minus and plus buttons. An "OK" button is at the bottom.
- What is your weight?**: A slider set to 125 lbs. Radio buttons for Kg, Pound (selected), and Stone are below. An "OK" button is at the bottom.
- What is your blood pressure?**: Two sliders for systolic and diastolic pressure, set to 120 / 70 mmHg. "OK" and "Skip" buttons are at the bottom.
- How many times a week do you exercise or engage in physical activity?**: A slider set to 4. An "OK" button is at the bottom.
- What is your level of education?**: Three icons representing -6 Years, 7 - 9 Years, and 10+ Years. The 7 - 9 Years option is selected.

Note: app interface has changed since paper publication, but algorithm remains the same.

SCORE



The next three screens show the calculated dementia risk scores:

- Score 0 / 15 (Low)**: "Your answers indicate that your risk of developing dementia in the next 20 years is LOW 1%". The risk is lower than the average in your age group. A "Back to start" button is at the bottom.
- Score 3 / 10 (Moderate)**: "Your answers indicate that your risk of developing dementia in the next 10 years is MODERATE 6.8%". The risk is higher than the average in your age group. A "Back to start" button is at the bottom.
- Score 9 / 12 (High)**: "Your answers indicate that your risk of developing dementia in the next 10 years is HIGH 35.9%". The risk is higher than the average in your age group. A "Back to start" button is at the bottom.

- Depression
- Heart disease
- Memory
- Brain disease
- Diabetes



Guidance for risk reduction

By making changes to your lifestyle you can reduce your risk score, click to see how.

Following these tips could reduce your risk score from **11 to 8**



Diabetes

It is important to get the right treatment for diabetes from your healthcare provider.

Memory loss

A combination of healthy eating and exercise is good for your brain. If you feel that your memory is clearly worse than before, it is important to contact your healthcare provider.

Cerebrovascular disease

It is important to get the right treatment for cerebrovascular diseases from your healthcare provider.

Physical activity

Try to exercise for **at least 20 minutes twice a week**, it could reduce your risk score by **2**.

Research suggests that even small amounts of exercise (including simple exercise like walking) seem to be good for brain health and may protect against dementia. Any physical activity you can build into your daily routine will help. For example:

- Take the stairs instead of the elevator or escalator
- Go for a walk every day for as long as you can

- Work in the garden
- Dancing is a very social activity and can be an enjoyable way to participate in exercise.

Depression

If you can take steps to feel less depressed it may reduce your risk score by **1**.

It is important to get the right treatment for depression, start by contacting your healthcare provider. Many people with depression benefit from increased activity and socialization, including things like exercise, time with children and activities involving pets.

Conclusions



The CAIDE Dementia Risk Score is a validated tool to predict late-life dementia risk (20 years later), based on midlife risk factors.

The goal was to make this prediction tool (*the score*) widely accessible.



Conclusions

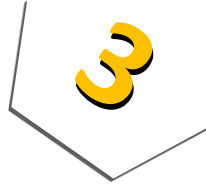


The CAIDE Risk Score App is the first to predict the risk for dementia through an important evidence-based tool.

The App can encourage users to actively decrease their risk factors & postpone dementia, taking more responsibility for their health! 💪



Conclusions



Using the app may help decrease the burden on medical and health services by postponing dementia *and*

other chronic diseases such as diabetes and cancer, which share the same risk factors included in the CAIDE Dementia Risk Score.





Question
time!

What's the main
benefit you see in
using an app like
CAIDE Risk Score
App?



What do you think is
the next step after
developing the app
and making it freely
available to the public?



What similarities do
you see between
CAIDE App and the
Triage App from the
TedTalk (Mohammed Dalwai)?



What other apps would you use in conjunction with CAIDE to aid in the prevention of dementia?





Thanks!