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# The effect of golf and the impact of the COVID-19 on physical activity, quality of life, and exercise motivation in individuals over the age of 65

**Submission date**
04/09/2021

**Recruitment status**
No longer recruiting

**Registration date**
07/09/2021

**Overall study status**
Completed

**Last Edited**
20/10/2023

**Condition category**
Other

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

**Plain English summary of protocol**
Background and study aims
The COVID-19 pandemic poses societal challenges through regional restrictive measures. Restrictions affect the exercise habits of the elderly and reduce social contacts. Golf, Nordic walking and walking are moderately loaded forms of health-promoting outdoor exercise that can be practiced safely within official restraint guidelines during a pandemic. The aim of the study is to highlight the physiological responses of individual exercise performance to heart rate and heart rate variability, fat and sugar metabolism, the occurrence of brain-derived and inflammatory biomarkers, balance, and the occurrence of positive and negative emotional conditions associated with exercise performance. In addition, the study aims to examine the overall impact of age-appropriate forms of health exercise on an individual's physical, mental, and social well-being and factors influencing exercise motivation during the COVID-19 pandemic.

Who can participate?
Persons aged 65 years or older, who are members of Tarina Golf RY and play golf once a week during summer.

What does the study involve?
For participants, it will take five days to participate in the study. The study includes an initial meeting; baseline measurement and three actual study days. Participants will be randomly allocated to either a round of golf, Nordic walking,or walking activity on one day. During the study participants must follow the study guidelines, for example, fill the forms and use study actigraph.

What are the possible benefits and risks of participating?
The participant receives research results and information about their own physical performance and physiological responses of golf, Nordic walk and walking. Participants are also informed that this is possible, as there is no personal benefit to participating in this study. Healthy participants are recruited for the study. There are no significant risks to the participants in the study. Taking

tests and blood samples and installing the FreeStyle Libre sensor under the skin may feel a little uncomfortable. It takes some time to complete the survey-related forms and complete the survey measurements.

Where is the study run from?
University of Eastern Finland

When is the study starting and how long is it expected to run for?
May 2021 to May 2025

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Julia Kettinen, julia@kettinen.fi

# Contact information

### Type(s)
Scientific

### Contact name
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# Additional identifiers

### Clinical Trials Information System (CTIS)
Nil known

### ClinicalTrials.gov (NCT)
Nil known

### Protocol serial number
Nil known

# Study information

## Scientific Title
Acute physiological responses of golf and the impact of the COVID-19 pandemic to physical activity, quality of life and exercise motivation in individuals over the age of 65

## Acronym
GOLFIX

## Study objectives
The study is divided into two parts: (1) experimental research (randomized controlled trial), and (2) electronic survey (cross sectional).

1. Research questions: The effect of a single round of golf /Nordic walking / walking on the balance, heart rate, heart rate variability, prevalence of biomarkers of lipid and glucose metabolism, the prevalence of brain-derived and inflammatory biomarkers in in blood samples, positive and negative emotional states before exercise in people over 65 years of age and the differences between exercise performances for the above-mentioned emotional states
2. Research Question: Has the COVID-19 pandemic affected the physical activity, experience of their own physical condition and state of health, the quality of life of the subjects? What motivates those to be supported to move during the COVID-19 pandemic?

## Ethics approval required
Old ethics approval format

## Ethics approval(s)
Approved 09/06/2021, Ethics Committee, Hospital District of Northern Savo (Puijonlaaksontie 2, PL 100, 70029 KYS, Finland; +358 (0)17 173 311; tutkimuseettinentoimikunta@kuh.fi), ref. 1073 /2021

## Study design
Interventional randomized controlled trial and cross-sectional observational study

## Primary study design
Interventional

## Study type(s)
Other

## Health condition(s) or problem(s) studied
Degenerative brain diseases, Cardiovascular disease, type 2 diabetes, Metabolic syndrome, Physical activity, quality of life and exercise motivation

## Interventions
Experimental study/ Implementation 09/2021, Tarina Golf Kuopio.
30 (15 men, 15 women) people over the age of 65 will be recruited for the study. Participants will be recruited through Tarina Golf's official membership register. Volunteers who meet the inclusion criteria will be contacted by telephone, provided with a subject's bulletin and an appointment time to complete the health/background information questionnaire and consent form. The doctor in charge of the study reviews the health information forms, after which the subject is informed of his or her eligibility for the study. In the same study visit, the subject is measured for weight, height, body composition by bioimpedance measurement, waist and pelvis circumference, blood pressure, and a UKK 6 min walk test and SPPB (short physical performance

test) test measuring performance. Participants are randomized into three groups, each performing these exercises on separate days.

• Baseline measurements: weight, height, body composition with bioimpedance measurement, waist and pelvis circumference, blood pressure, UKK 6 min walk test, SPPB test, balance
• Measurement before exercise (fasting) and after exercise, blood pressure, blood tests: cytokines, myokines, adipokines e.g., IL-6, TNA-alpha, BDNF, continuous tissue glucose measurement / blood glucose monitoring, lipid profile, cognition (Trail Making Task A and B), positive and negative emotions (PANAS), balance (ainone-balance test)
• Measurement during exercise: (heart rate, heart rate variability, number of steps, number of km)
The study is conducted in two weeks, with 15 people in the first week and 15 people in the second. The duration of the study is Monday to Friday, five working days, of which the subjects complete the exercise for three working days and the related measurements.
• Test day: 5 participants Golf round 18-hole, 5 participants Nordic walking 6 km, 5 participants walking 6 km
• Rest day, no exercise
Preliminary schedule for the research day (Monday, Wednesday, Friday): 6:30 a.m. Study staff arrives on site, 7.00 am The first measurement of the study before exercising in the overnight fast, 7-9 pm Participants in the study will be offered standardized breakfast before the exercise, At 9.00 Exercises begin (golf round 4h, Nordic walking 6 km, walking 6km) in stages, 10-14.30 Second measurement of the study after exercise, 2.30 pm The examination is over, the subjects are allowed to go home after the second measurements, At 3:00 p.m., During test days participants are offered a standardized breakfast on the mornings and lunch after exercise. Participants keep food dairy 5 days and physical activity and continuous tissue glucose monitored during the whole test week.

2) Electronic survey /Implementation 09/2021.
The survey is a continuation of the survey conducted in 2021 (Kettinen ym. 2021). Subjects will be recruited as officials through member information register systems (Suomen Golfliitto, Suomen Latu and Kävelykipinä-project). A request to participate in the study and a Study Bulletin on the processing of personal data in the study will be sent by e- mail from the register to each member over the age of 65. In addition, the clubs will add a prior information bulletin to their websites, which will provide further information on the implementation of the study. The survey questionnaire includes these parameters: IPAQ (physical activity), SGPALS (physical activity), Euro-HIS-8 or WHOQOL-8 (quality of life meter), REMM (Exercise motivation ) and it is behind a separate link, which is sent only to those invited to the survey

## Intervention Type
Other

## Primary outcome(s)
1. BDNF concentration measured by blood test before and after golf round, Nordic walking and walking
2. Cognition measured using Trail Making Task A and B before and after golf round, Nordic walking and walking
3. Average 24-h blood glucose measured using Freestyle libre sensor after golf round, Nordic walking and walking

## Key secondary outcome(s))

1. Blood pressure (sphygmomanometer, mmHg) and lipid concentration (blood test) before and after golf round, Nordic walking and walking
2. Myokine and adipokine concentrations measured using blood test before and after golf round, Nordic walking and walking
3. Balance, measured using the Ainone Balance test before and after golf round, Nordic walking and walking
4. Occurrence of positive and negative emotional conditions measured using PANAS- test before and after golf round, Nordic walking and walking

### Completion date
01/05/2025

## Eligibility

### Key inclusion criteria
1. Age> 65 years
2. Valid membership in Tarina Golf RY
3. HCP <36
4. Golf activity: Summer season play at least once a week
5. Functionality/fitness: able to perform physical exercises without separate aids (e.g. golf cart)

### Participant type(s)
Healthy volunteer

### Healthy volunteers allowed
No

### Age group
Senior

### Sex
All

### Key exclusion criteria
1. Dementia
2. Alzheimer's disease
3. Parkinson's disease
4. Severe obesity (BMI> 35 kg/m²)
5. Cardiovascular disease
6. Heart pacemaker

### Date of first enrolment
01/08/2021

### Date of final enrolment
31/08/2021

## Locations

### Countries of recruitment
Finland

### Study participating centre
**University of Eastern Finland**
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## Sponsor information

### Organisation
University of Eastern Finland

### ROR
https://ror.org/00cyydd11

## Funder(s)

### Funder type
Other

### Funder Name
Investigator initiated and funded

## Results and Publications

### Individual participant data (IPD) sharing plan
The current data sharing plans for this study are unknown and will be available at a later date.

### IPD sharing plan summary
Data sharing statement to be made available at a later date

### Study outputs

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Results article | | 12/10/2023 | 20/10/2023 | Yes | No |
| Interim results article | cardiometabolic markers results | 04/01/2023 | 24/02/2023 | Yes | No |

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|---|---|---|---|---|---|
| Participant information sheet | in Finnish | 06/05/2021 | 07/09/2021 | No | Yes |