27.09.2023

Information sheet for study participants

The Exercise Snacking Study at the University of Konstanz

Study supervisor: PD Dr. Michael Schwenk, Yvonne Ritter

Study coordinator: Xuehui Sun, Louis Spendler

Exercise Snacking Study Overview

We appreciate your interest in participating in the Exercise Snacking Study. This information sheet provides you with all the information you need to give informed consent to participate. Therefore, please read this information completely and carefully. If you have any questions or need further information, please feel free to contact the trial director or the study coordinator at any time.

Who is conducting the study?

The Exercise Snacking study is being conducted by a team of researchers from the departments of sports science (Dr. Michael Schwenk, Yvonne Ritter, Xuehui Sun, Louis Spindler) at the University of Konstanz.

Who can I contact with questions about the study?

If you have any questions about the study or would like more information, please feel free to contact the study coordinator, Xuehui Sun, by email. Of course, you can also reach him by phone or mail.

Xuehui Sun

Telephon:	+49 174 4218288
Email:	exercise-snacking@uni-konstanz.de
Addresss:	Universität Konstanz, Postfach 30 (Michael Schwenk), 78457 Konstanz

What is the goal of the study?

The aim of the "Exercise Snacking" study is to investigate how a six-week training program consisting of short "Exercise Snacks" in the form of (stair climbing) influences endurance and the chronic stress response. In addition, questionnaires will be used to determine how the training program affects chronic stress and how well the Exercise Snacks in the form of stair climbing can be integrated into everyday life. In order to determine the physiological processes as well as the feasibility of the training in everyday life, different measurement methods will be used at the beginning and end during the course of the study, which are explained in this document.

The study is located at the interface between basic and applied research. No medical tests are carried out in the study and no medical diagnoses can be made by means of the measurement methods used.

Who can and cannot participate in the Exercise Snacking study?

Men and women from 18 years old to 59 years old, join less than 1 time per week structured exercise can participant in the study.

Excluded from participation are people with cardiac problems (eg. Aortic stenosis, mitral stenosis, myocardial disease, malignant or exercise arrhythmias, exercise fainting, intercardiac shunt, genetic channelopathies, recent myocardial infarction or heart failure, severe left ventricular dysfunction, severe pulmonary arterial hypertension), disorder of bone or calcium metabolism, body mass index greater than 30 (kg/m2), bone fracture (in the past year), or severe lower extremity injury (in the past 6 months). Other exclusion criteria include a positive test for hepatitis B, hepatitis C, or HIV, a cancer diagnosis, current treatment with drugs or radiation, and long-term treatment with glucocorticoids. In addition, people with neurological diseases (e.g., epilepsy, Parkinson's disease, or stroke) are excluded from participation in the above study.

Why is my participation in the study important?

The study helps the researchers to better understand which processes are triggered by training. This is an important basis for the development of effective interventions to promote physical activity in the general population.

Procedure of the study

The study covers a period of 8 weeks and is composed as follows.

- Week 1: Information appointment and measurement in the laboratory
- Week 2-7: Implementation of Exercise Snacking training
- End week 8: measurement in the laboratory

Week 1: Information meeting and measurements at the beginning of the study

During the first week, an information appointment will take place at the University of Konstanz. At this appointment, you can ask questions about the information sheet and then agree to participate in the study. If you agree to participate, you will receive introductory instructions and complete several initial questionnaires that ask for personal and demographic data and information about your physical condition and chronic stress. You will also be introduced to the sports watch that will be used in the study.

Sports watch

At the information session, you will be given a sports watch to wear for the entire duration of the study. This is a Polar Ignite 2 Fitness Watch (see illustration; information at https://www.polar.com/de/ignite2). This watch will be used to record all of your exercise sessions as well as your physical activity. In addition, the watch has an optical heart rate sensor to measure your pulse and sensors to determine the position of your body in space. The study director will explain how to use the watch.

Polar Ignite 2
© Polar Electro

Measurement of endurance performance

To determine their VO2max, their endurance performance is determined by a ramp test on a bicycle ergometer. This is an endurance test in which the resistance is continuously increased until the test is stopped. Your task here is to ride as long as possible until you signal to us that you are exhausted and the test should be stopped. Parallel to cycling, your respiratory gases are analyzed by means of spirometry (see figure on the right). The oxygen and carbon dioxide concentrations in the air you breathe are measured. For this purpose, you wear a tightly fitted mask over your mouth and nose, which is connected to a gas analysis device by means of a flow meter. As the load gradually increases, various climatically relevant threshold values can be recorded, as well as breathing rate, their respiratory volume and maximum oxygen uptake. These data, along with continuous heart rate measurement throughout the test, allow us to determine their overall performance.

Spirometrie auf dem Fahrradergometer
© Polar Electro

Jump test

To investigate the changes in jump height before and after the intervention, all participants must perform three countermovement jumps with the "Leonardo" force plate. The countermovement jump is performed with the hands on the hips and the eyes focused on a point in front of the wall. The jump test with "Leonardo" is used to analyze the average jump height, peak voluntary power, maximum voluntary muscle power and movement asymmetries. After jumping off the force plate, the legs must be stretched.

Stair Climbing Test

The stair-climbing strength test is a simple test with two trials. The test subjects climb approx. 20 standard stairs as quickly and safely as possible.

Chronic Stress Questionnaire

Before and after the intervention, we will measure participants' chronic stress using the Trier Inventory of Chronic Stress (TICS) (Schulz, Schlotz, and Becker, 2004). We will use the

TICS 12-item questionnaire with 5 frequency scales ranging from never to often. Participants have to indicate their chronic stress in the last 6 weeks. It is the first instrument to explicitly capture domain-specific chronic stress in a single questionnaire, including work overload, social overload, performance pressure, job dissatisfaction, excessive job demands, lack of social recognition, social tension, social isolation, and chronic worry.

Week 2-7: Exercise Snacking Training

In weeks 2-7, you will perform the provided training program in your everyday life. You perform the training yourself with the help of the Polar Ignite 2, which is provided for this purpose. The training starts with a personal trainer meeting to work out a training plan, which you will then perform independently using the Polar Ignite 2 watch. During further meetings you will have the opportunity to adjust the training plan and gradually increase the load.

Week 8: Laboratory measurements

In week 8, the same measurements take place as in week 1 before you started the training program. In addition, you will be asked about the feasibility of the training using a questionnaire.

Feasibility Questionnaire

After completion of the study, the subjects will be asked about the feasibility of the exer-cise snacking training program as well as technical and motivational aspects by means of a questionnaire.

Risiks and Advantages

Possible risks and inconveniences

The Exercise Snacking study includes measurements of physical performance parameters before and after the performance of physical training. The associated risks and discomforts are presented below for clarity in the descriptions of the training or measurements.

It is possible that, due to the load in the performance tests and the training sessions, muscle soreness may occasionally occur and last for a few days. At maximum physical load, where maximum heart rates are reached, there is also a risk of overload. This maximum load can be reached during the ramp test in the laboratory measurements and during short phases in the training units. In rare cases, coughing, exercise-induced asthma, pallor or cold sweat, headache or dizziness may occur. These symptoms serve as a criterion for stopping the test and usually decrease rapidly afterwards. If these symptoms persist for a longer period of time or if a feeling of discomfort persists, it is recommended to consult a physician.

In very rare cases, the performance tests can result in an undersupply of oxygen to various parts of the body. Symptoms are pain in the chest area (angina pectoris), shortness of breath, shortness of breath, pain in the muscles (e.g. thighs or lower legs when cycling or

running) or cyanosis (bluish discoloration of the lip-pen). You are required to immediately report any pain in the chest, breathing, legs, arms, or anywhere else in the body to the test director or trainer. These symptoms are immediate discontinuation criteria. They also usually return to normal quickly after the stress ends, but an emergency physician will be called if such symptoms occur. In extremely rare cases, very serious, life-threatening complications (cardiac arrest, stroke, emboli) may occur. For healthy, active persons under 60 years of age, this risk is additionally reduced. The risk may be increased by a heart defect that may be previously undetected. Therefore, regardless of your state of health, we recommend a preliminary examination by a cardiologist who can assess proper heart function by means of a stress ECG and an ultrasound examination of the heart.

Advantages and allowances

With your participation, you will make an important scientific contribution by helping us to better understand the physiological processes involved in physical activity. On this basis, effective interventions for the promotion of physical activity can be developed. In addition, your participation will also provide you with concrete personal benefits.

Health benefits

They participate free of charge in a six-week training program that has been developed by PD Dr. Michael Schwenk, a member of the Training and Exercise Science group, and is tailored specifically to them. Previous studies have shown that the training has a positive effect on endurance performance. .

Financial and pecuniary benefits

For the duration of the study you will be provided with a sports watch, which you can keep after the end of the study as compensation for your efforts. This is a Polar Ignite 2 multisport watch worth 220 euros (as of 24.09.2023; for more information on the watch. Please note that the watch remains the property of the University of Konstanz until the study is fully completed and only then becomes your property. If you terminate the study prematurely, the watch remains the property of the University.

Data protection regulations

Personal data (e.g. name, address, email address) are collected as part of the study. This is necessary for contacting you, for example to arrange appointments, to inform you about a random finding or to delete data in case of withdrawal from the study. These data will be kept absolutely confidential at all times. The data will be used exclusively within the framework of the Exercise Snacking study. Only authorized project staff, who are bound by confidentiality, will have access to this data.

You will create an individual participation code for the purpose of the study, which can be used to link your data from the different measurements. This code cannot be assigned to a specific person by third parties without knowledge of additional information. The assignment

of the participation code to your personal data is done by means of a list to which only the study coordinator has access for the duration of the study.

After the end of the study, your personal data will be completely deleted as soon as it is possible according to the research purpose. In the process, your participation code will also be replaced by an anonymous code, so that there is no longer any possibility of assigning your data to you. The data will be stored electronically on servers of the university, to which legal access from the outside is not possible.

The anonymized data set is used for scientific publications (e.g. storage in public repositories, publication of evaluations in scientific journals). The data will be stored for at least 10 years according to the recommendations of the German Research Foundation (DFG). In addition to the researchers involved in the Exercise Snacking study, the fully anonymized data can also be used by other researchers (e.g. in the context of replications or meta-analyses).

You have the right to request information about your stored personal data from the person responsible for the study (see below) at any time. You can also revoke your consent to participate in the study at any time and demand the correction of inaccurate data as well as the deletion of the data or restriction of its processing and data transfer. This possibility expires after anonymization, as your data can then no longer be assigned.

The person responsible for the study-related collection of personal data is:

Xuehui Sun

Telefon:	+49 174 4218288
Email:	exercise-snacking@uni-konstanz.de
Anschrift:	Universität Konstanz, Postfach 30, 78457 Konstanz

If you have any concerns regarding data processing and compliance with data protection requirements, you can contact the following data protection officer at the University of Konstanz:

Heinz-Joachim Sommer

Email:	datenschutzbeauftragter@uni-konstanz.de
Address:	Datenschutz-Sommer, Sommertalweg 1, 88709 Meersburg

In the event of unlawful data processing, you have the right to lodge a complaint with the following supervisory authority:

The State Commissioner for Data Protection and Freedom of Information of Baden-Württemberg

Telephone:	0711 61 55 41 – 0
Fax:	0711 61 55 41 – 15
E-Mail:	poststelle@lfdi.bwl.de
Internet:	http://www.baden-wuerttemberg.datenschutz.de
Post address:	Postfach 10 29 32, 70025 Stuttgart
Visting address:	Lautenschlagerstraße 20, 70173 Stuttgart

Insurance coverage

There is no accident or commuting insurance for your study participation. You must immediately report any damage that you believe is due to the study to the study management. In case of culpable damage caused by the study staff, the state of Baden-Württemberg is liable.

Voluntariness and withdrawal

Participation in the study is voluntary. If you wish to participate, we ask you to sign the enclosed consent form. You can revoke this consent at any time in writing or verbally without giving reasons and without incurring any disadvantages. If you wish to withdraw your consent, please contact the study director or study staff. In the event of a revocation, you can decide whether the data collected from you for study purposes should be deleted or may continue to be used for the purposes of the study. Even if you initially agree to further use, you can still change your mind later and request deletion of the data; please also contact the study management or the study staff for this. Please note that data that have already been included in scientific evaluations and also data that have already been anonymized can no longer be deleted at your request and that the revocation of consent does not affect the lawfulness of the processing carried out on the basis of the consent up to the revocation.