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NUtrition and Running High MIlage Study

Submission date
25/05/2015

Recruitment status
No longer recruiting

Registration date
12/06/2015

Overall study status
Completed

Last Edited
30/07/2025

Condition category
Nutritional, Metabolic, Endocrine

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

Plain English summary of protocol

Background and study aims
The numbers of vegetarians and vegans are growing worldwide, even faster than anticipated. This trend is unbroken with projections showing 30 – 37 million Europeans to eat vegetarian or vegan. Thus, the vegan diet along with other vegetarian kinds of diet is currently booming not only in the mainstream but also in recreational and top-level sports. Moreover, 'Everybody runs!' with millions of people being active in running worldwide. After projections about 50 million Europeans are active runners, this shows running is one of the biggest mass-movements in sports. Considering both these increasing background numbers, this happens also for the cross-section of runners who adopt vegetarian and vegan diets, too. Thus, we assumed that the cut-set of vegetarians/vegans and runners is even higher compared with other sports. Therefore, the NURMI Study was designed as a comparative study to investigate the prevalence of omnivores, vegetarians, and vegans in running events and to detect potential differences in running performance comparing three (omnivorous, vegetarian, vegan) dietary subgroups. As, the NURMI Study connects both these two mass-movements to focus the following objectives: The major goal of the NURMI Study is to compare endurance performance of vegetarian and vegan runners to non-vegetarian marathon runners. The second goal is to investigate the prevalence of vegetarian and vegan runners in endurance (half-marathon and marathon) events. The third goal is to validate the subjects self-reports on food frequency and dietary behavior.

Who can participate?
Step 1 (pre-study): Healthy male and female adult volunteer runners at or above the age of 18 who are active in running on a regular basis, participating in running events at all distances and at all levels, and following an omnivorous, vegetarian or vegan diet.
Step 2 and 3 (main study): Healthy male and female adult volunteer runners at or above the age of 18 who are active in running on a regular basis, participating in running events at all levels coping with at minimum half-marathon distance, and following an omnivorous, vegetarian or vegan diet.,
Participants need to meet the inclusion criteria. For successful participation in the main study a complete data set consisting of the following four items is required: (1) written informed consent, (2) at least 18 years of age, (3) all NURMI questionnaires completed, and (4) successful participation in a running event of either half-marathon or marathon distance.

What does the study involve?
We investigated runners of the following study groups: Dietary subgroups (Step 1,2 and 3):

omnivorous, vegetarian, vegan. Distance subgroups (at all levels): all distances (Step 1), at minimum half-marathon distance, marathon, ultra-marathon (Step 2 and 3). Complete data set coping with full information on the NURMI Study (see also: Inclusion criteria): Pre-study Step 1: Short online questionnaire Step 1 completed. Main study Step 2 and 3: Pre-race: Detailed online questionnaire Step 2 completed. Race and post-race: Both running event over at least half-marathon distance and short online questionnaire STEP 3 completed.

What are the possible benefits and risks of participating?
There are no side effects of taking part in the NURMI Study. All measurements are routine for acitve runners, and justifiable and reasonable from a medical perspective. Thus, there is no additional risk for those taking part. Participation is voluntary and discontinuation will be possible at any time and without negative consequences. There will be no immediate direct benefit to those taking part. But there should be benefits from a future perspective. The study will be considered a contribution for endurance runners following a vegetarian or vegan diet. It also adds knowledge to the currently very limited body of science, especifically to the vegan endurance runner. Moreover, it might help to eliminate remaining concerns of coaches and runners as it has the potential to indicate the adequacy of vegetarian and vegan diets on running performance as shown by professional runners.

Where is the study run from?
The NURMI Study is being run by the study coordinator at the Centre for Research and Knowledge Management, Pedagogical University Tyrol, Innsbruck, Austria. It takes place in Pedagogical University Tyrol, Innsbruck, Austria (lead); Institute of Primary Care, University of Zurich and Gesundheitszentrum St. Gallen, both Switzerland; and Institute of Nutrition, University of Giessen, Germany, coping with the core region of German-speaking countries of Europe (Germany, Austria, Switzerland).

When is the study starting and how long is it expected to run for?
Jan 2014 to December 2020

Who is funding the study?
There is no funding

Who is the main contact?
Dr. rer. nat. Katharina Wirnitzerb
http://www.nurmi-study.com/en/mission/

Study website
http://www.nurmi-study.com

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
N/A

Study information

Scientific Title
Prevalence in running events and running performance of endurance runners following a vegetarian or vegan diet compared to non-vegetarian endurance runners: The NURMI Study

Acronym
NURMI

Study objectives
It is reasonable to assume that a vegetarian or vegan diet is compatible with successful endurance and ultra-endurance performance?

The NURMI Study will be conducted in three steps following a cross-sectional design. Step 1 intends to determine epidemiological aspects of endurance runners (any distance) using a short standardized questionnaire. Step 2 intends to investigate dietary habits and running history from eligible participants (capable of running a half-marathon at least) using an extended

standardized questionnaire. Step 3 intends to collect data after a running event on finishing time and final ranking as well as a post-race rating of perceived exertion, mood status, nutrient and fluid intake during the race.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics board St. Gallen, Flurhof 7 9007 St.Gallen, Switzerland, ref: EKSG 14/145

Study design
The NURMI Study will be conducted in three steps following a cross-sectional observational design using online questionnaires. Core region are German-speaking countries of Europe such as Germany, Austria, and Switzerland.

Primary study design
Observational

Secondary study design
Cross sectional study

Study setting(s)
Other

Study type(s)
Other

Participant information sheet
http://www.nurmi-study.com/faq/

Health condition(s) or problem(s) studied
Diet and running performance

Interventions
We assess dietary and running habits, running events, as well as quality of life with online questionnaires only.

Intervention Type
Other

Primary outcome measure
In addition to running performance adjusted to performance level, the primary outcome is the prevalence of types of diets (omnivorous, vegetarian, vegan) among runners attending running events. Individual finishing time will be measured by the running events professional timing system and will be calculated as percentage of the overall winner’s time.

Secondary outcome measures
Outcomes from Step 1 are: nationality, sex, age, body weight, height, BMI (calculated), type of diet, attended races in past two years, finished running distances, personal best time on each distance, number of planned events for 2014/2015, in-race food and fluid consumption, daily /weekly training frequency, daily/weekly training load, period of preparation for main event, and

aim of race participation.
Outcomes from Step 2 are: years of running experience, motivation for running then and now, assisted training, years of race experience, training intensity, medium/long-term goal of racing, additional specific kinds of training, specific diet including supplements, specific training/diet prior to race, diet on day of rest/training/race, pre/in/post-race diet, specific gear, relevant medical measures, and quality of life and health-related behavior.
Outcomes from Step 3 are: pre-race: body weight (including clothing and shoes). In-race: individual finishing time, individual runtime as % of overall winners time (calculated), ranking, calculated pace, temperature, wind, air pressure, humidity, sunlight. Post-race: body weight (including clothing and shoes), calculated weight loss, RPE (Borg) whole body/respiratory/legs, mental mood, fluid and nutrient intake including breakfast, and dietary strategy during race.

Overall study start date
01/10/2014

Completion date
31/12/2015

Eligibility

Key inclusion criteria
For the epidemiological pre-study (Step 1) any subject active in running (any distance as well as any performance level) can participate.
For successful participation in the main study (Step 2 & 3) a complete data set consisting of the following four items is required:
1. Written informed consent
2. At least 18 years of age
3. All NURMI questionnaires completed
4. Successful participation in a running event of either half-marathon or marathon distance

Participant type(s)
Healthy volunteer

Age group
Adult

Lower age limit
18 Years

Sex
Both

Target number of participants
10,000

Key exclusion criteria
1. Participation in other clinical trials simultaneously
2. Have impaired health status or known diseases
3. Use doping agents

Date of first enrolment
01/02/2015

Date of final enrolment
01/03/2015

Locations

Countries of recruitment
Austria

Germany

Switzerland

Study participating centre
Institut für Hausarztmedizin der Universität Zürich
Universitäts Spital Zürich
Pestalozzistrasse 24
Zürich
Switzerland
8091

Sponsor information

Organisation
Zurich University (Institut für Hausarztmedizin der Universität Zürich)

Sponsor details
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Sponsor type
Hospital/treatment centre

Website
www.hausarztmedizin.uzh.ch

ROR
https://ror.org/02crff812

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
Zurich University (Institut für Hausarztmedizin der Universität Zürich)

Results and Publications

Publication and dissemination plan
Planned publication of three results papers and participation in the ECSS 2017.

Added 10/07/2018:
Wirnitzer K, Leitzmann C, Knechtle B, Nikolaidis P, Wirnitzer G, Lechleitner C, Seyfart T, Boldt P (2016). The NURMI Study: Methodology and First Results of the Prevalence of Vegetarians and Vegans in Running Events. In: Kessler C, Michalsen A (eds.). VegMed – Scientific Congress for Vegetarian Nutrition and Medicine. April 22-24, 2016, Berlin. Abstracts. Research Sessions, NO. 36. Forschende Komplementärmedizin 23(suppl 1):9
Abstract book is available online only: http://vegmed.de/user/pages/03.program/_intro/FOK_S1_16_VegMed.pdf

Wirnitzer KC, Knechtle B, Nikolaidis PT (2016). PREVALENCE OF OMNIVORES, VEGETARIANS AND VEGANS IN RUNNING EVENTS: THE NURMI STUDY
21th annual Congress of the ECSS – European College of Sport Science: http://ecss-congress.eu/2016
Preview of the respective Oral Session: PH Nutiriton & Diets – cancelling and surveys is available online:
http://ecss-congress.eu/2016/16/index.php/programme/scientific-programme/oral-sessions

Wirnitzer KC (2018) Vegan nutrition: latest boom in health and exercise.
In: Grumezescu AM & Holban AM (ed., 2018). Therapeutic, Probiotic, and Unconventional Foods. Section 3: Unconventional Foods and Food Ingredients. Chapter 21.
Academic Press, Elsevier. ISBN: 978-0-12814-625-5
https://www.elsevier.com/books/therapeutic-probiotic-and-unconventional-foods/grumezescu/978-0-12-814625-5

Wirnitzer KC (2018) Vegan nutrition in sport and health: boom or ancient wisdom. In: Kessler C & Michalsen A (ed., 2018). VegMed: VegMed – Scientific Congress for Plant-based Nutrition and Medicine. April, 20-22, 2018, Berlin. Complementary Medicine Research. Practice, Methods, Perspectives, Vol 25(Suppl1):9. Karger Publishers, online only: https://www.karger.com/Article/Abstract/488417

Boldt P, Knechtle B, Nikolaidis P, Lechleitner C, Wirnitzer G, Leitzmann C, Wirnitzer KC (2018) Health status of vegetarian/vegan and omnivorous endurance runners – results from the NURMI-Study (Step 2). In: Kessler C & Michalsen A (ed., 2018). VegMed: VegMed – Scientific Congress for

Plant-based Nutrition and Medicine. April, 20-22, 2018, Berlin. Complementary Medicine Research. Practice, Methods, Perspectives, Vol 25(Suppl1):10-11. Karger Publishers, online only: https://www.karger.com/Article/Abstract/488417

Intention to publish date
31/12/2017

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study is not expected to be made available due to data security. All data are treated according to appropriate Federal Data Security Laws. Since the Study Coorinator is located in Austria, the data are held in fulfilling the Austrian in line with the international Data Security Laws.
Gathered data will be stored pseudoanonymised. Each subject will be assigned an identification code (ID), which will be kept in a separate database. Questionnaire data and subject's registration data will be stored in different databases.
ID linkage will allow us to assign questionnaire data to each subject's data set. All members of the research staff are bound to their professional obligation to discretion. Data will be used and analysed exclusively and only in the context of the NURMI Study. Access to the server as well as the file- and database-backups is restricted to the IT staff of the study team and the hosting provider (also a project partner), and further the statistics team.

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	14/04/2016		Yes	No
Basic results		25/07/2017	16/07/2018	No	No
Results article	results	04/02/2021	23/02/2021	Yes	No
Results article	step 2 results	27/09/2021	29/09/2021	Yes	No
Results article	step 2 results	18/06/2022	20/06/2022	Yes	No
Results article	step 1 results	05/02/2022	10/07/2023	Yes	No
Results article	step 1 results	07/10/2021	10/07/2023	Yes	No
Results article	step 2 results	30/07/2022	10/07/2023	Yes	No
Results article	step 2 results	06/04/2023	10/07/2023	Yes	No
Results article	step 2 results	09/05/2023	10/07/2023	Yes	No
Results article	step 2 results	14/10/2022	10/07/2023	Yes	No
Results article	step 2 results	14/10/2022	10/07/2023	Yes	No
Results article	step 2 results	10/08/2021	10/07/2023	Yes	No
Results article	step 2 results	17/07/2018	10/07/2023	Yes	No
Results article	step 2 results	07/09/2022	10/07/2023	Yes	No

Results article	step 2 results	22/06/2022	10/07/2023	Yes	No
Results article	step 2 results	13/08/2021	10/07/2023	Yes	No
Results article	step 2 results	22/12/2018	10/07/2023	Yes	No
Results article	dietary habits - step 2 results	27/05/2024	30/07/2025	Yes	No
Results article	race distance - step 2 results	09/01/2024	30/07/2025	Yes	No
Results article	race history by distance - step 2 results	23/10/2023	30/07/2025	Yes	No