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Orienteering camp training and youth wellbeing: tracking stress, fatigue and emotions over 4 weeks

Submission date 22/08/2025	**Recruitment status** No longer recruiting	[_] Prospectively registered [X] Protocol [X] Statistical analysis plan [X] Results [_] Individual participant data
Registration date 26/08/2025	**Overall study status** Completed	
Last Edited 02/01/2026	**Condition category** Other	

Plain English summary of protocol

Background and study aims
This study examines how a 4-week national orienteering training camp affects teenagers' bodies and minds compared with usual club training. The researchers will track changes in heart-rate variability (a marker of autonomic recovery), morning salivary cortisol (a stress hormone), mood and sleep across 28 days to see whether the camp supports healthier adaptation.

Who can participate?
Healthy adolescents aged 15–18 years with at least 2 years of official orienteering competition experience and medical clearance for training. If under 18, a parent or legal guardian must give consent and the participant provides assent.

What does the study involve?
Participants either attend the national preparation camp or continue their usual club training. Everyone completes brief assessments on Day 1, Day 14 and Day 28: a 5-minute seated morning heart-rate recording while rested and fasted, a small first-waking saliva sample for cortisol, and short questionnaires on perceived stress and mood. Sleep quality and emotional skills are assessed at the start and Day 28. A simple weekly rating of training effort is also recorded. Procedures are non-invasive and each assessment takes about 20–30 minutes. Usual training continues unchanged.

What are the possible benefits and risks of participating?
Direct benefits are not guaranteed, but regular check-ins may help athletes understand training and recovery. Risks are minimal and relate mainly to normal sports participation, brief discomfort from wearing a chest strap, saliva collection, and time spent on questionnaires. Participation will not change medical care.

Where is the study run from?
National Youth Orienteering Preparation Camp (Jiangsu Province), with academic oversight from the School of Physical Education, Shanxi University (Taiyuan, China)

When is the study starting and how long is it expected to run for?
May 2024 to August 2024

Who is funding the study?
Key Provincial Think Tank for Ideological Research and Database Construction in Shanxi (Commissioned Project YSXTZK2022019)

Who is the main contact?
Dr Haiyan Li, aepigenetic@gmail.com

Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

Protocol serial number
YSXTZK2022019

Study information

Scientific Title
Adolescent orienteers aged 15–18 in a 4-week national preparation camp versus matched club-trained peers effects on autonomic function, endocrine stress (salivary cortisol), and emotional state over 28 days

Acronym
Y-ORIENT

Study objectives
The objective is to quantify temporal changes in psychological stress, physical fatigue and emotional states during a 4-week national youth orienteering camp, and compare trajectories with matched club-trained controls. The primary hypothesis is that camp participants will show a

greater increase in resting RMSSD from Day 1 to Day 28. Secondary hypotheses are that, over the same period, camp participants will show larger gains in SDNN and positive affect (PANAS-C), greater reductions in salivary cortisol and perceived stress (PSS-10), better sleep (PSQI), and higher emotional intelligence (EISA-24).

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 15/06/2024, Shanxi University Ethics Research Committee (Institutional Review Board) (School of Physical Education, Shanxi University, No. 92 Wucheng Road, Taiyuan, 030006, China; +86 (0)351-7010255; xiaoban@sxu.edu.cn), ref: AD2024-197

Study design
Prospective longitudinal non-randomized parallel-group interventional study

Primary study design
Interventional

Study type(s)
Efficacy, Quality of life

Health condition(s) or problem(s) studied
Psychophysiological stress, physical fatigue, and emotional wellbeing in adolescent orienteers during an intensive training period

Interventions
A 4-week national orienteering camp curriculum (navigation drills, terrain running, interval sessions, and routine morning assessments) is compared with matched club training as usual. Allocation is by natural group (camp vs club), open label, with assessments on Day 1, Day 14, and Day 28.

Intervention Type
Behavioural

Primary outcome(s)
Autonomic recovery (resting heart-rate variability root mean square of the successive differences [HRV, RMSSD] in ms) measured using a 5-minute seated morning HRV recording under fasted, rested conditions with a Polar H10 chest-strap sensor (Polar Electro Oy, Finland), analysed in Kubios HRV v3.x (Kubios Oy, Finland), at Day 1, Day 14, Day 28; primary endpoint is the change Day 1 to Day 28. (If a 1-lead ECG ≥500 Hz is used instead of the chest strap, the device make/country will be recorded in the site file; analysis remains in Kubios HRV v3.x.)

Key secondary outcome(s))
1. Cardiac autonomic variability (standard deviation of normal-to-normal [SDNN] in ms) measured using the same 5-minute morning HRV protocol with Polar H10 (Polar Electro Oy, Finland) and Kubios HRV v3.x (Kubios Oy, Finland) at Day 1, Day 14, Day 28; change Day 1 to Day 28.
2. Sympathovagal balance (low-frequency/high-frequency [LF/HF] ratio) derived from the same HRV session analysed in Kubios HRV v3.x (Kubios Oy, Finland) at Day 1, Day 14, Day 28; change Day 1 to Day 28.

3. Endocrine stress (morning salivary cortisol, nmol/L) measured by ELISA using the Salimetrics® Salivary Cortisol Kit (Salimetrics LLC, USA; e.g., cat. 1-3002) with absorbance read at 450 nm on a BioTek Epoch 2 microplate reader (Agilent BioTek, USA), from first-waking saliva at Day 1, Day 14, Day 28; change Day 1 to Day 28 (exploratory AUC across 28 days).
4. Perceived stress measured using the Perceived Stress Scale-10 (PSS-10) total score at Day 1, Day 14, Day 28; change Day 1 to Day 28.
5. Affect measured using the Positive and Negative Affect Schedule for Children (PANAS-C) (positive and negative subscales) at Day 1, Day 14, Day 28; change Day 1 to Day 28.
6. Sleep quality measured using the Pittsburgh Sleep Quality Index (PSQI) total score at Day 1 and Day 28; change Day 1 to Day 28.
7. Perceived training load measured using session rating of perceived exertion (Borg CR-10 scale) from weekly training logs over Weeks 1–4; endpoints are weekly means.
8. Trait emotional intelligence measured using the Emotional Intelligence Scale for Adolescents (EISA-24) total score at Day 1 and Day 28; change Day 1 to Day 28.

Completion date
28/08/2024

Eligibility

Key inclusion criteria
1. Age 15–18 years
2. Active orienteering athlete with ≥2 years of official competition experience, confirmed by records/coach
3. Medically cleared for training, with no contraindications to moderate–vigorous exercise
4. Able and willing to provide morning saliva samples and complete HRV and questionnaires at Day 1, Day 14, and Day 28
5. Written informed consent (and parent/guardian consent plus participant assent if <18 years)

Participant type(s)
Healthy volunteer, Learner/student

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
15 years

Upper age limit
18 years

Sex
All

Total final enrolment
72

Key exclusion criteria
1. Acute illness or injury precluding training or scheduled assessments
2. Medications or conditions affecting autonomic or endocrine measures (e.g., beta-blockers, systemic corticosteroids, untreated thyroid disease)
3. Current febrile illness within 7 days of an assessment timepoint
4. Inability/unwillingness to provide saliva samples or complete HRV and questionnaires per schedule
5. No medical clearance, or lack of consent/assent
6. Pregnancy (for female participants), due to hormonal confounding

Date of first enrolment
01/07/2024

Date of final enrolment
31/07/2024

Locations

Countries of recruitment
China

Study participating centre
National Youth Orienteering Preparation Camp (Hailan Pegasus Watertown)
No. 888 Nanhuan Road
Xinqiao Town
Jiangyin
China
214426

Sponsor information

Organisation
Shanxi University

ROR
https://ror.org/03y3e3s17

Funder(s)

Funder type
Research organisation

Funder Name
Key Provincial Think Tank for Ideological Research and Database Construction in Shanxi (Commissioned Project YSXTZK2022019)

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analysed during the current study will be available upon request from Haiyan Li (aepigenetic@gmail.com). De-identified IPD will include resting HRV metrics (RMSSD, SDNN, LF/HF), morning salivary cortisol, perceived stress (PSS-10), mood (PANAS-C), sleep quality (PSQI), emotional intelligence (EISA-24), weekly session-RPE, and basic demographics/training characteristics, with a site code. Data will become available 6 months after primary results are published and remain available for 3 years. Access will be granted for non-commercial, methodologically sound proposals that include a brief analysis plan, evidence of local ethics approval, and a signed data-use agreement; transfer will occur via secure institutional mechanisms. Anonymisation will remove direct identifiers, offset dates, bin ages within the 15–18 range, and suppress rare combinations to minimise re-identification risk. Because participants include minors, sharing is limited to cases where consent/assent and guardian consent cover de-identified data reuse; where consent does not allow this, only aggregate outputs will be provided and raw IPD will not be shared.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		17/12/2025	02/01/2026	Yes	No
Participant information sheet			26/08/2025	No	Yes
Protocol file			26/08/2025	No	No
Statistical Analysis Plan			26/08/2025	No	No