Visegrad Fund

An innovative Physical Education model for sustainable personal and environmental health

The GreenPE Project

Project methodology and results outline

CATHOLIC UNIVERSITY IN RUZOMBEROK

CHARLES UNIVERSITY, PRAGUE

UNIVERSITY OF PHYSICAL EDUCATION IN KRAKOW

UNIVERSITY OF PECS
as coordinator of the GreenPE project

2025

THE GREENPE PROJECT

WHAT IS GREENPE?

The Green Physical Education (GreenPE) is an innovative university physical education model developed in the frames of a Visegrad Fund project for a sustainable personal and environmental health. GreenPE experts deliver low-energy-cost outdoor physical activity to the general university student population to target mental and physical fitness, and health behaviour, of which quantitative and qualitative pilot data is collected.

WHO ARE THE GREENPE EXPERTS?

GreenPE experts are a group of academic professors, PE teachers, and PhD students qualified and experienced in exercise physiology, kinesiology, psychology, education, recreation and tourism, fitness, athletics, strength training and conditioning, from four universities. GreenPE experts are strongly committed towards university physical education innovation by developing and validating a unique model for students and to disseminate its methodology Europe-wide.

WHAT MOTIVATES US?

The detrimental effects of physical inactivity amount to being the 4th leading cause of death worldwide. Reversing the evolution of sedentary behaviour and physical inactivity is of utmost importance during university years. After university, by mid-life, only 20-30% of the European population meet WHO physical activity recommendations. However, the prevalence of sedentariness is much higher (50-60%) in university students than the global average. The university period is thus the 'last minute' to lay the foundation of positive health-related behaviours that support well-being into adulthood. There is also a lack of a unified and universal curriculum university students can rely on to get information and practice guides to become engaged in physical activity now and later in life. Moreover, 95% of PE classes are conducted in indoor facilities, producing unsustainable energy costs and unwanted impacts on the environment. GreenPE fills this gap by organizing most activities outdoors.

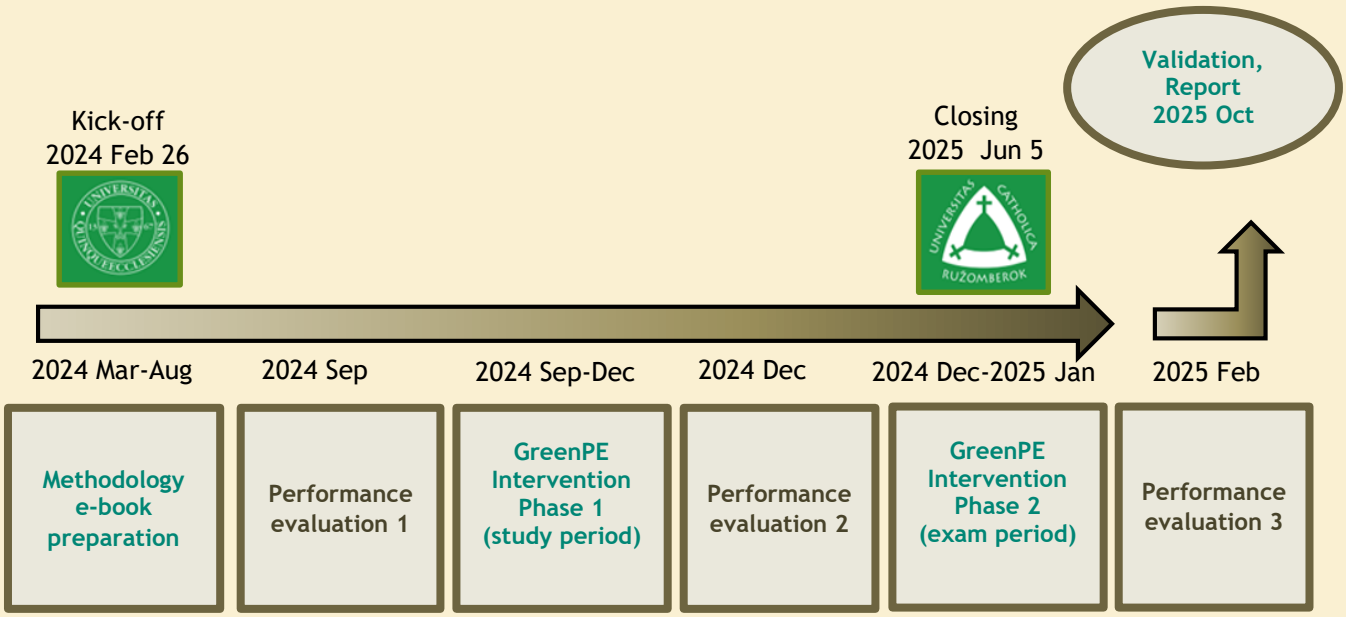
WHAT DO WE DO?

GreenPE proposes and validates a multi-dimensional PE model involving a one-semester-long outdoor physical activity with two conducted PE sessions, one supervised home-based exercise session, and one fitness theory lesson/week. The supervised home-based exercise is extended also to the exam period. Our trainers gradually get the students accustomed to the cold environment during outdoor sessions. Before and after the intervention, students are assessed on mental and physical health status and fitness knowledge using standard fitness test batteries and questionnaires.

THE GREENPE METHODOLOGY

PROJECT TIMELINE

The project consists of a preparation, an intervention, and a validation phase. Within the frames of the project, in the preparation phase, a methodological e-book was written on the general guidelines for exercising outdoor, which was provided for students. The e-books can be downloaded **HERE** in five languages. The GreenPE outdoor physical education intervention lasted one semester, but students' physical activity was extended to the exam period. Three time during the project, students were tested on psychological and motoric status, and fitness literacy.



INTERVENTION DESIGN

From week 1 to 14 (study period), two outdoor PE sessions and one theoretical lecture on the concepts of physical fitness were conducted by GreenPE experts (PE/fitness instructors) and their sports science student peers. Additionally, participants individually performed one home-based physical activity session per week. Considering recent scientific, methodological, and safety recommendations, trainers gradually got students accustomed to the cold environment during outdoor sessions. Students also learned how various weather conditions affect physiological and psychical parameters. The exercise was extended to the study period (week 15 to 20), during which, participants continued physical activity according to a prescribed home-based workout program.

Before and after the study period, and at the end of the exam period, participants were assessed on mental and physical health status, and fitness knowledge, using standard fitness test batteries, blood analyses on inflammation markers, as well as psychological, sociological, and health literacy questionnaires. Also, weather conditions such as temperature, humidity, and precipitation, as well as students' level of motivation and effort was continuously monitored during PE sessions.

STUDY PERIOD

GreenPE
n=15 students/partner

EVALUATION PRE: body composition, strength, endurance, balance, power, motivation, fitness literacy, immune response

2x45min/wk outdoor exercise
1x45 min/wk home-based exercise
1x45min/wk fitness theory

EVALUATION POST: body composition, strength, endurance, balance, power, motivation, fitness literacy, immune response

EXAM PERIOD

2x45min/wk home-based exercise

EVALUATION FOLLOWUP: body composition, strength, endurance, balance, power, motivation, fitness literacy, immune response

GreenPE INTERVENTION EFFECTS SUMMARY

GreenPE students maintained or improved all anthropometric and motor skill levels in the study period

Mental health showed the greatest (15%) improvement

Endurance, balance, and power improved (3-4%), percent body fat reduced (-2.5%)

Fitness literacy in terms of perceived physical competency and commitment to exercise improved

GreenPE students preserved their health status during the exam period

Air temperature and relative humidity remained optimal in 90% of the PE sessions in the Visegrad countries

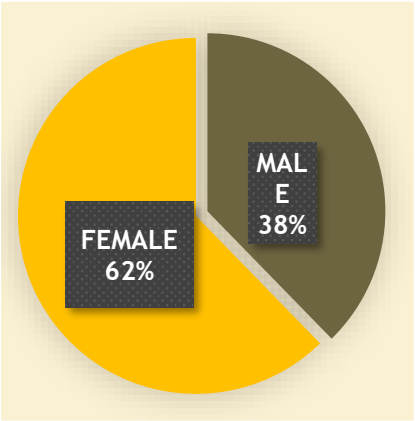
Shift from summer to winter season, along with declined air temperature, did not affect students' in-session motivation and voluntary effort levels nor elevations in their blood inflammation markers

GreenPE INTERVENTION EFFECTS

SPECIFIC RESULTS

PARTICIPANTS

HU n = 15
PL n = 15
CZ n = 11
SK n= 20



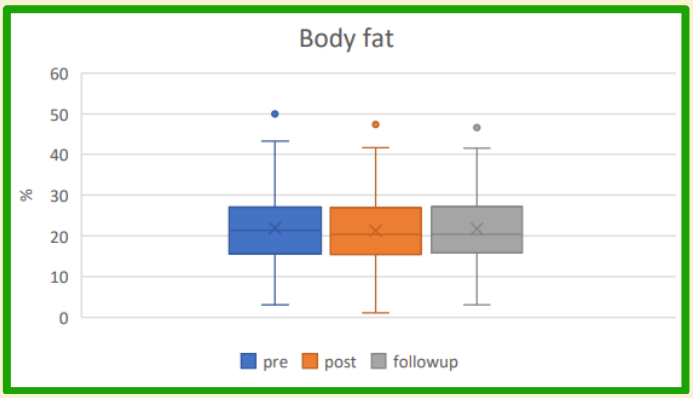
ANTHROPOMETRICS

BODY MASS

Comparison	Mean ± SD	% Change	*p*-value	Significance
PRE vs POST	68.39 ± 11.64 → 68.50 ± 11.59	+0.16 %	0.6171	No
POST vs FOLLOWUP	68.50 ± 11.59 → 68.70 ± 11.95	+0.29 %	0.2458	No

%BODY FAT

Comparison	Mean ± SD	% Change	*p*-value	Significance
PRE vs POST	21.82 ± 8.92 → 21.27 ± 8.96	-2.5 %	0.0256	Yes
POST vs FOLLOWUP	21.27 ± 8.96 → 21.70 ± 8.69	+2.0 %	0.0132	Yes



SIT AND REACH FLEXIBILITY

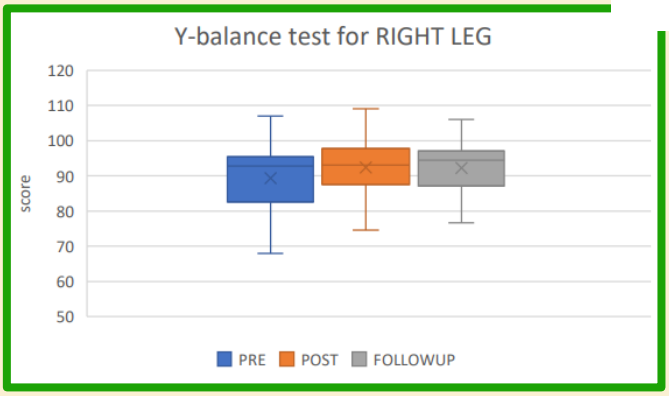
Comparison	Mean ± SD	% Change	p-value	Significance
PRE vs POST	16.08 ± 12.77 → 16.94 ± 12.15	+5.3 %	0.133	No
POST vs FOLLOWUP	16.94 ± 12.15 → 16.83 ± 11.66	-0.6 %	0.776	No

HANDGRIP STRENGTH

Comparison	Mean ± SD	% Change	p-value	Significance
PRE vs POST	37.94 ± 9.56 → 38.22 ± 9.51	0.7 %	0.507	No
POST vs FOLLOWUP	38.22 ± 9.51 → 38.68 ± 9.68	1.2 %	0.164	No

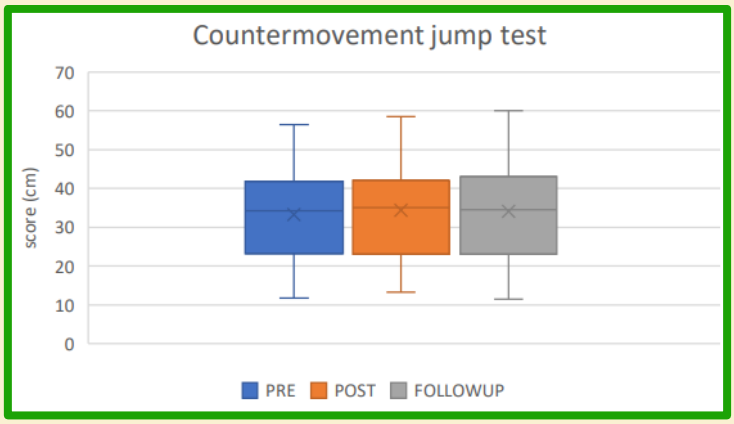
Y BALANCE

Comparison	Mean ± SD	% Change	p-value	Significance
PRE vs POST	89.30 ± 9.38 → 92.41 ± 8.24	+3.5 %	0.0028	Yes
POST vs FOLLOW-UP	92.41 ± 8.24 → 92.17 ± 7.49	-0.3 %	0.7352	No



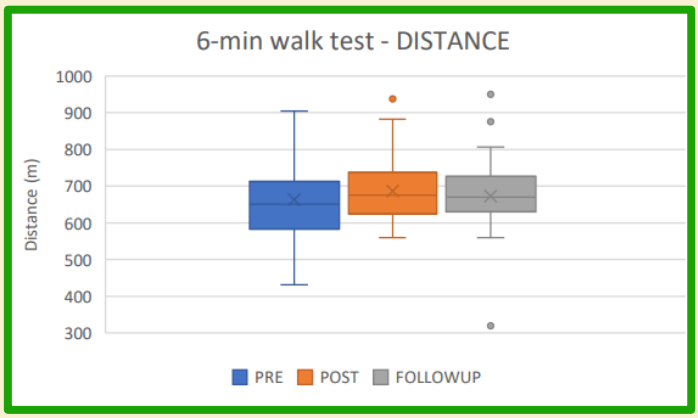
COUNTERMOVEMENT JUMP HEIGHT

Comparison	Mean ± SD	% Change	p-value	Significance
PRE vs POST	33.23 ± 11.64 → 34.33 ± 11.75	+3.3 %	0.0050	Yes
POST vs FOLLOWUP	34.33 ± 11.75 → 34.06 ± 11.82	-0.8 %	0.3649	No

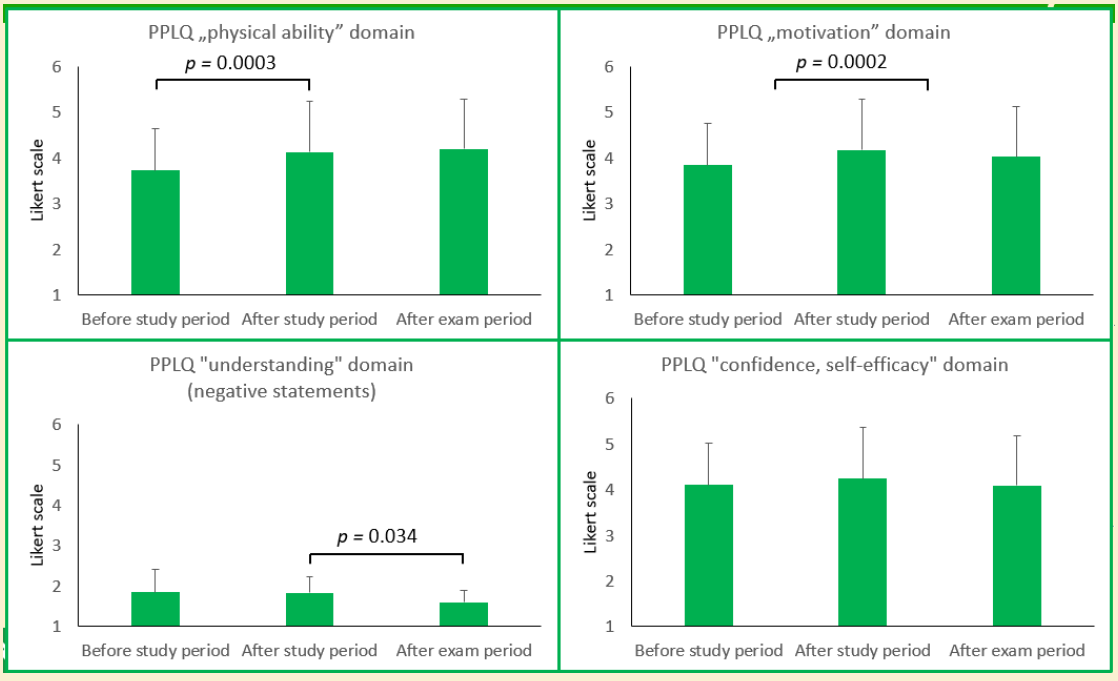


SIX-MINUTE WALK TEST DISTANCE

Comparison	Mean ± SD	% Change	p-value	Significance
PRE vs POST	662.79 ± 96.96 → 686.62 ± 87.44	+3.6%	0.0037	Yes
POST vs FOLLOWUP	686.62 ± 87.44 → 671.99 ± 88.83	-2.1%	0.0401	Yes

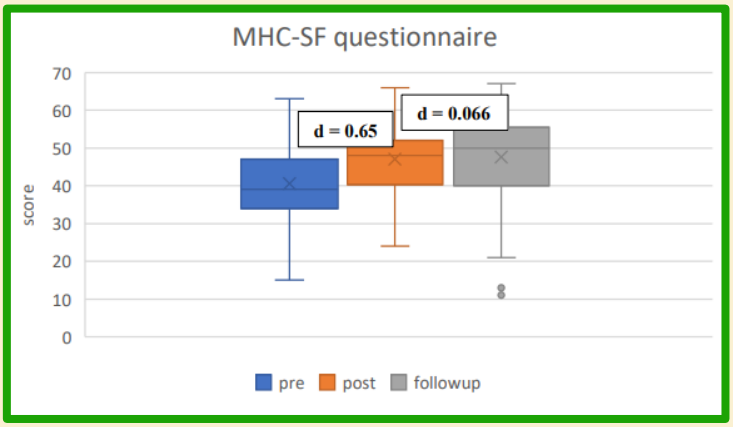


PERCEIVED PHYSICAL LITERACY SCORE

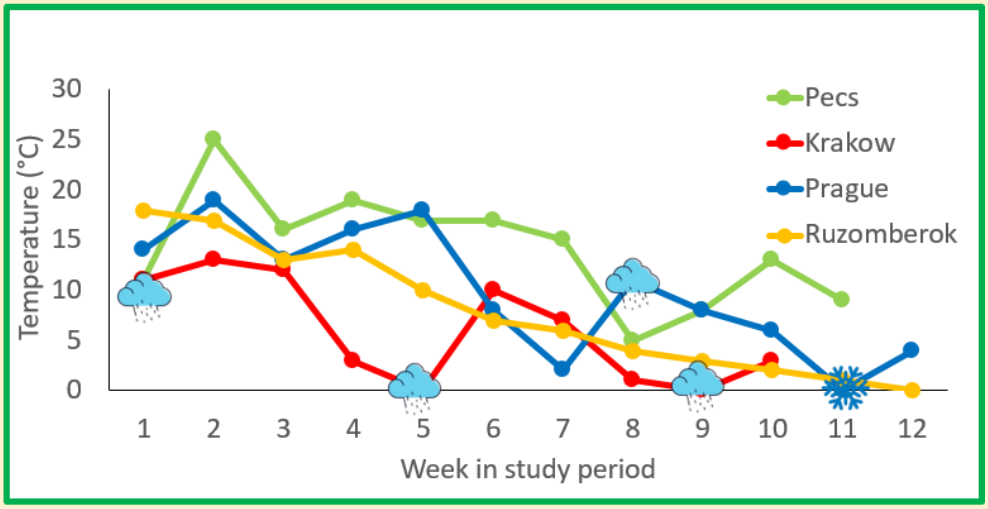


MENTAL HEALTH CONTINUUM SCALE SCORE

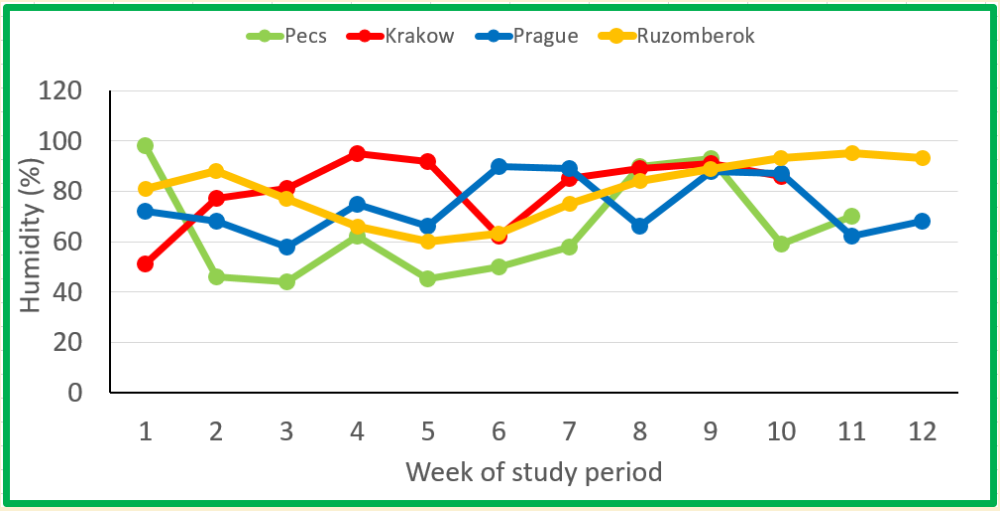
Comparison	Mean ± SD	% Change	*p*-value	Significance
PRE vs POST	40.64 ± 9.79 → 47.02 ± 9.87	+15.7 %	0.0000069	Yes
POST vs FOLLOWUP	47.02 ± 9.87 → 47.55 ± 12.21	+1.1 %	0.618	No



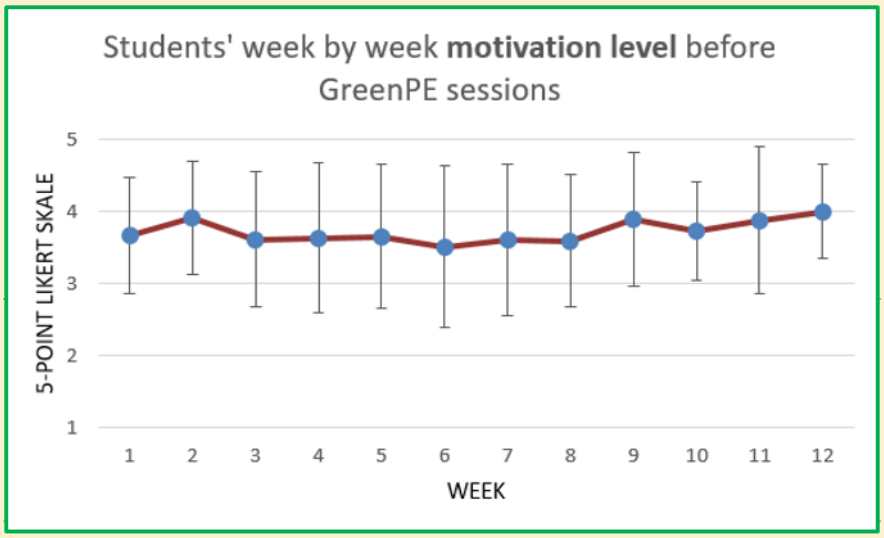
AIR TEMPERATURE



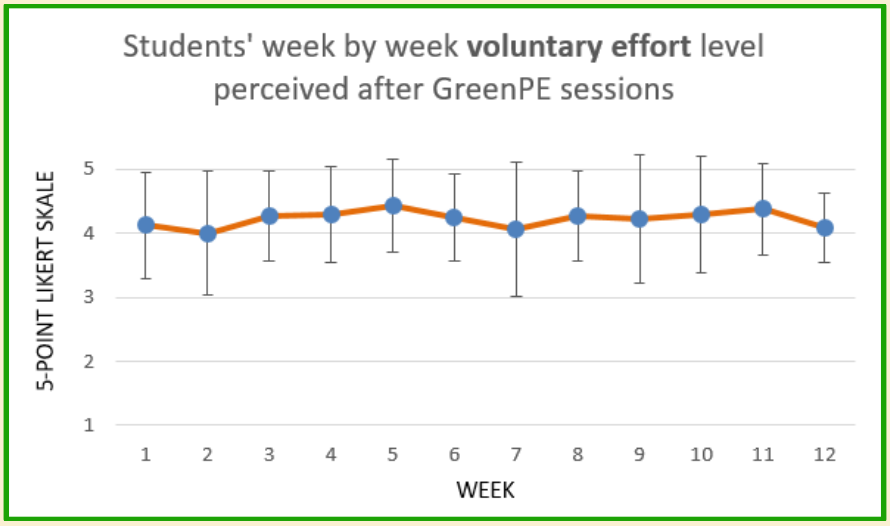
RELATIVE HUMIDITY



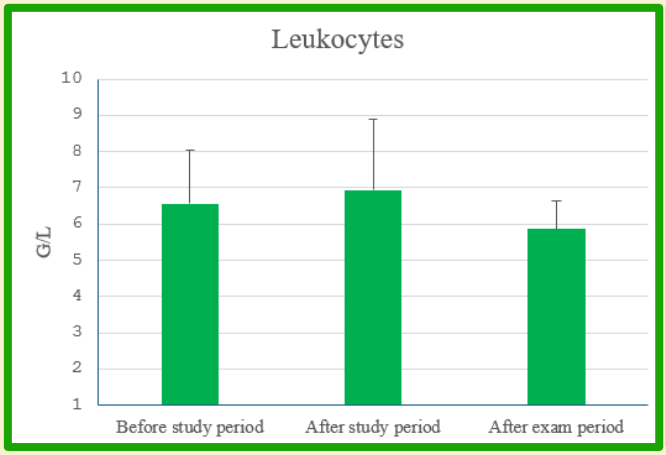
STUDENTS' IN-SESSION MOTIVATION LEVEL

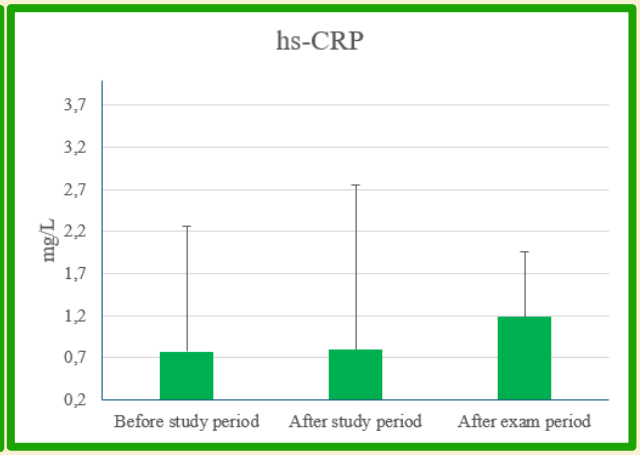


STUDENTS IN-SESSION VOLUNTARY EFFORT LEVEL



BLOOD INFLAMMATION MARKERS





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The GreenPE project

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Visegrad Fund

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