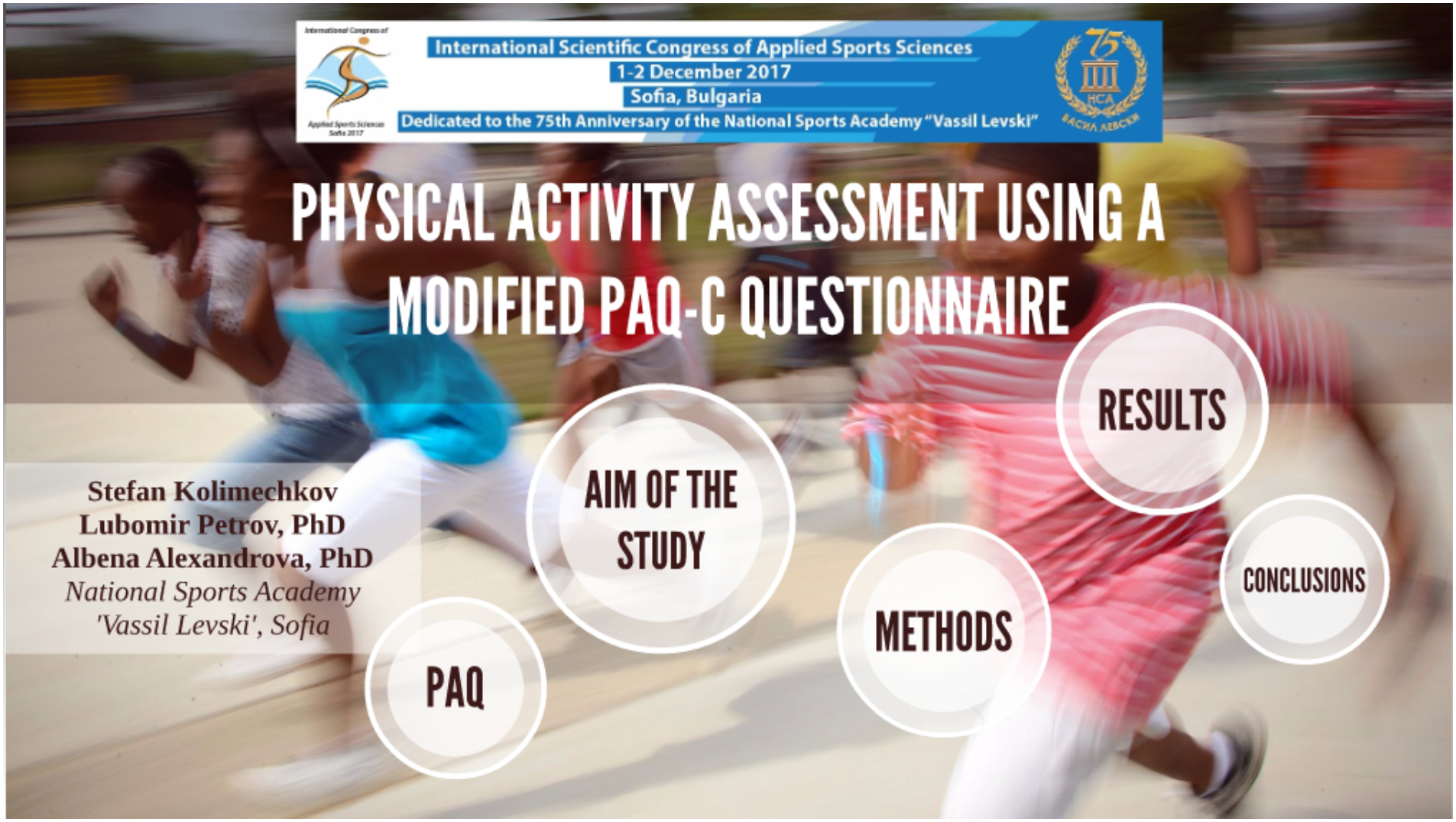
International Scientific Congress of Applied Sports Sciences
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Sofia, Bulgaria
Dedicated to the 75th Anniversary of the National Sports Academy "Vassil Levski"
PHYSICAL ACTIVITY ASSESSMENT USING A MODIFIED PAQ-C QUESTIONNAIRE
Stefan Kolimechkov
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Albena Alexandrova, PhD
National Sports Academy
'Vassil Levski', Sofia
AIM OF THE STUDY
RESULTS
METHODS
CONCLUSIONS
PAQ


BENEFITS OF PHYSICAL ACTIVITY
• Improved health of muscles, bones, and joints
• Positive social and mental health
• Decreased risk of developing diseases [U.S. Department of Health and Human Services 1996; Elliot et al., 2013]
Assessment Methods
Self-report Questionnaires

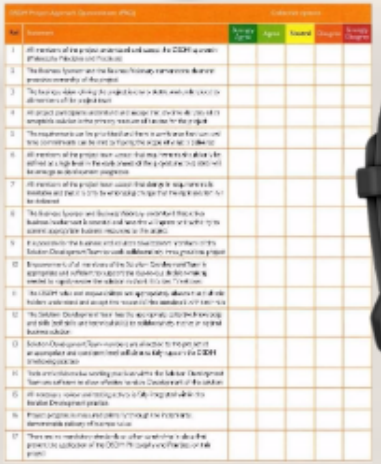
# Methods for assessing Physical Activity

**Subjective:**

Questionnaires

Interviews

Diaries



**Objective:**

Heart rate monitors

Pedometers

Accelerometers

# Potentially most suitable Self-report Questionnaires

## PAQ-C/PAQ-A

Physical Activity Questionnaire

Developed for:
Children and Adolescents

## YRBS

Youth Risk Behaviour Surveillance Survey

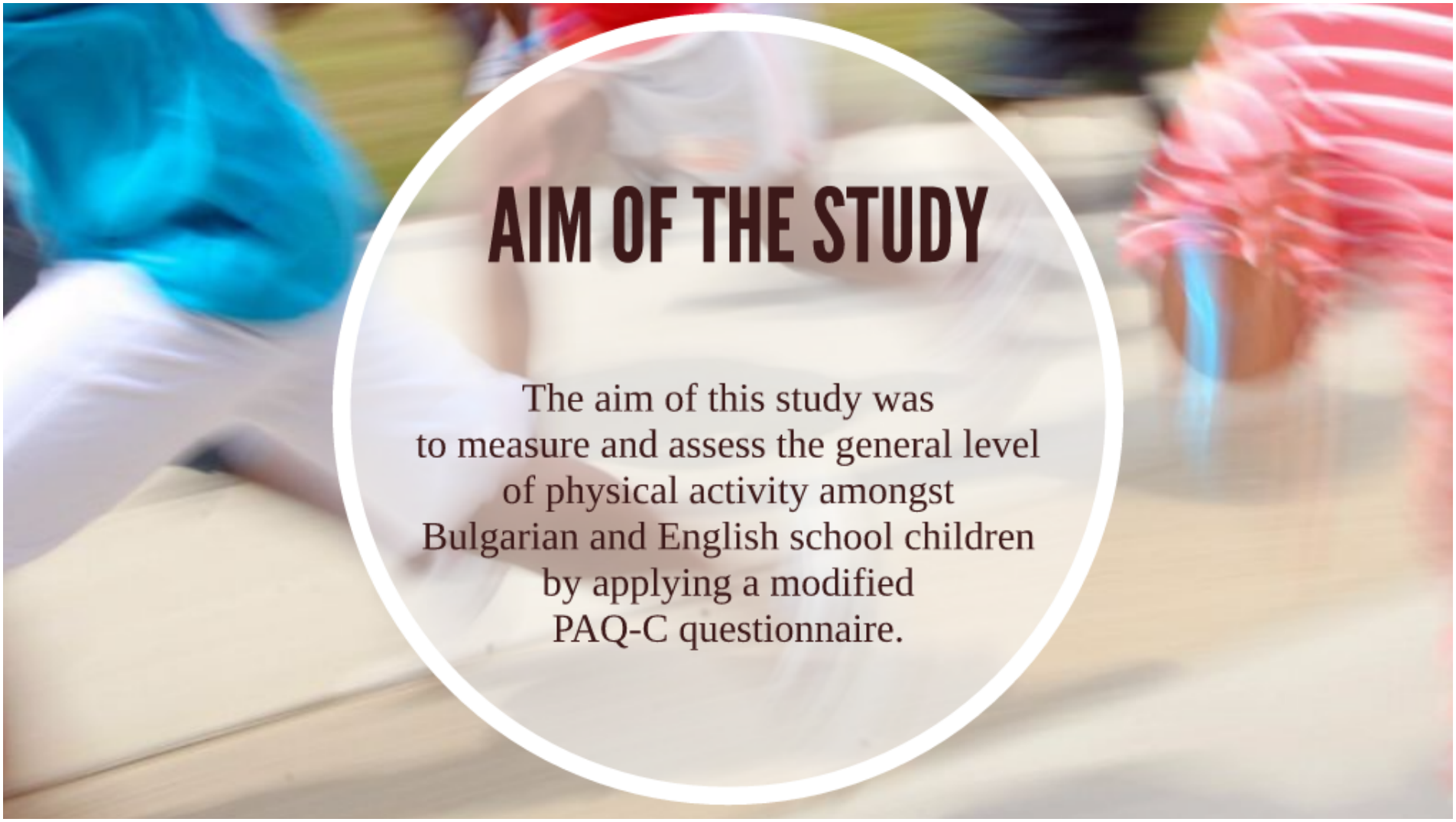
Developed for:
Adolescents and Adults

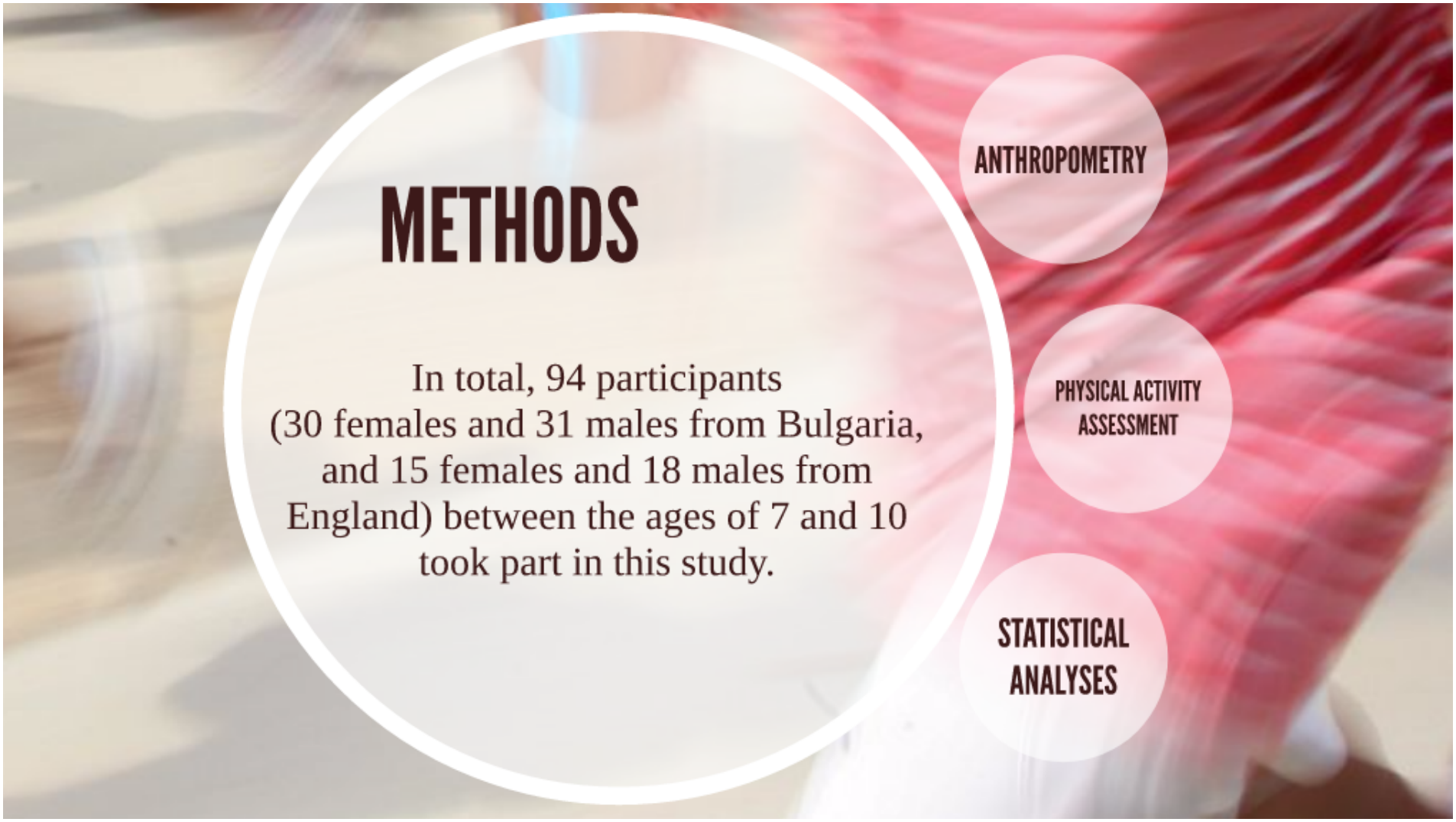
## THS

Teen Health Survey

Developed for:
Adolescents

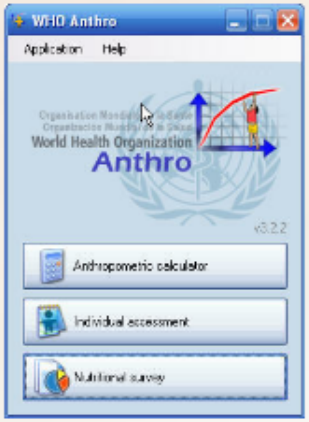
*[Biddle, S. J., Gorely, T., Pearson, N., & Bull, F. C. (2011). An assessment of self-reported physical activity instruments in young people for population surveillance: Project ALPHA. Int J Behav Nutr Phys Act, 8, 1]*


AIM OF THE STUDY
The aim of this study was
to measure and assess the general level
of physical activity amongst
Bulgarian and English school children
by applying a modified
PAQ-C questionnaire.


METHODS
In total, 94 participants (30 females and 31 males from Bulgaria, and 15 females and 18 males from England) between the ages of 7 and 10 took part in this study.
ANTHROPOMETRY
PHYSICAL ACTIVITY ASSESSMENT
STATISTICAL ANALYSES

# ANTHROPOMETRY

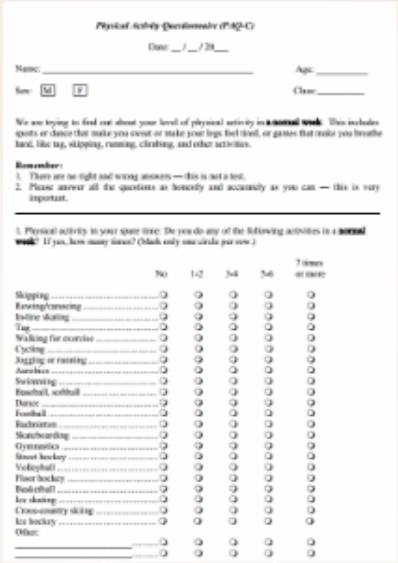
- Weight (kg)
- Height (cm)
- Waist circumference (cm)




- BMI (kg/m2)
- Z-scores and Percentile scores for weight, height and BMI
- Waist-to-Height ratio (WHtR)

  waist circumference (cm) / height (cm)

# PHYSICAL ACTIVITY ASSESSMENT



*Physical Activity Questionnaire (PAQ-C)*

Date: __ / __ / 20___

Name: _____ Age: _____

Sex: M F Class: _____

We are trying to find out about your level of physical activity in **a normal week**. This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and other activities.

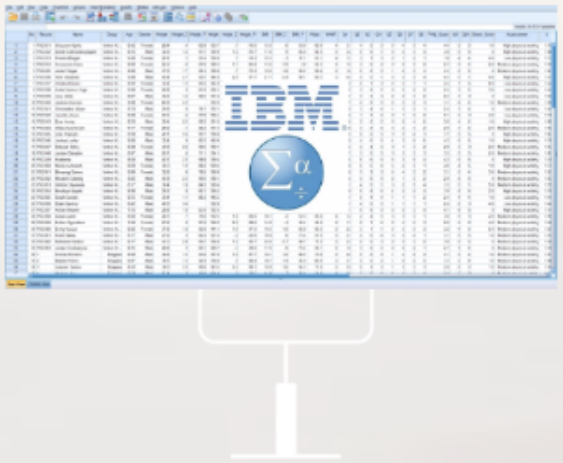
**Remember:**
1. There are no right and wrong answers — this is not a test.
2. Please answer all the questions as honestly and accurately as you can — this is very important.

1. Physical activity in your spare time: Do you do any of the following activities in a **normal week**? If yes, how many times? (Mark only one circle per row.)

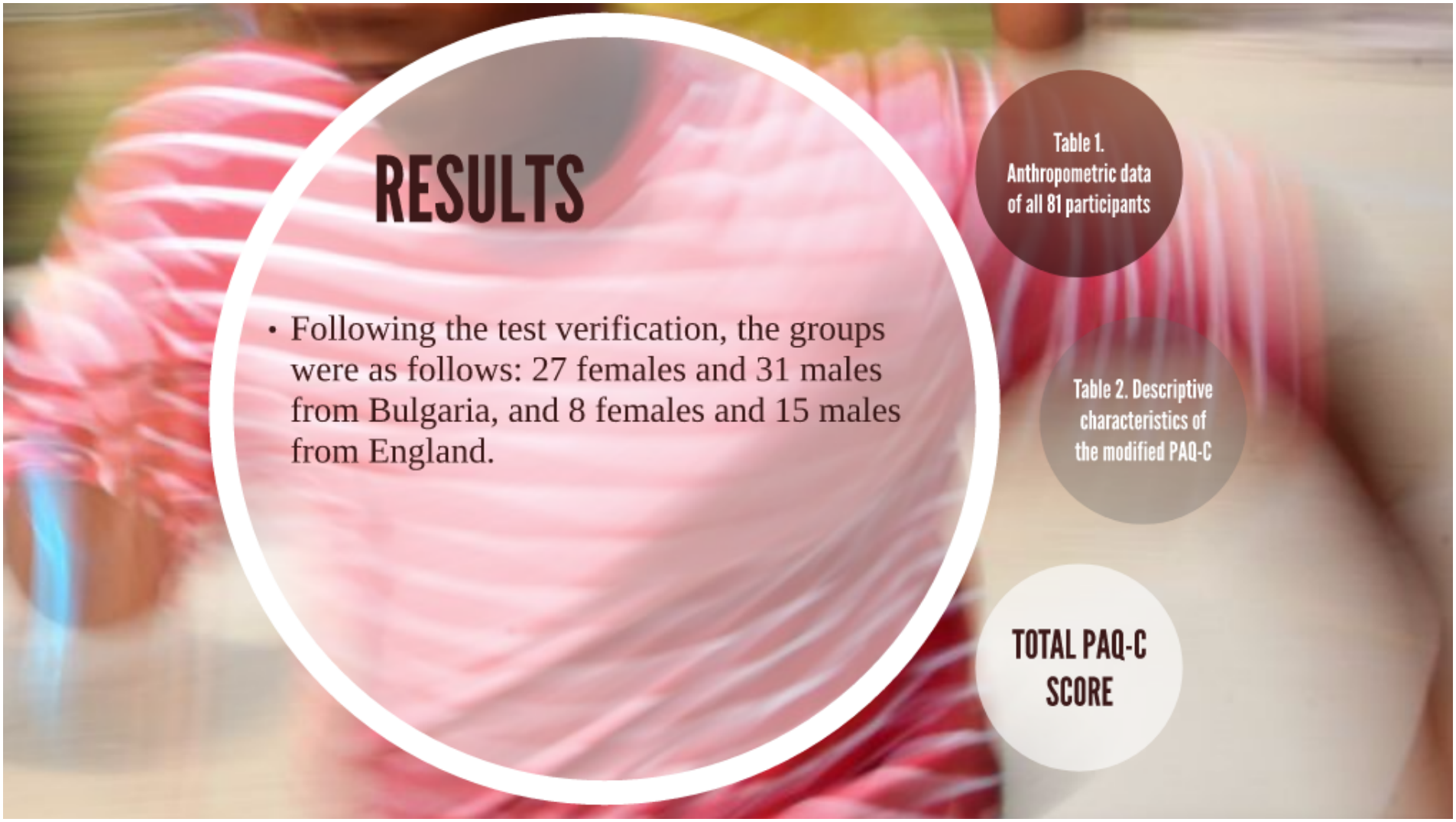
| | No | 1-2 | 3-4 | 5-6 | 7 times or more |
|---|---|---|---|---|---|
| Skipping | ○ | ○ | ○ | ○ | ○ |
| Rowing/canoeing | ○ | ○ | ○ | ○ | ○ |
| In-line skating | ○ | ○ | ○ | ○ | ○ |
| Tag | ○ | ○ | ○ | ○ | ○ |
| Walking for exercise | ○ | ○ | ○ | ○ | ○ |
| Cycling | ○ | ○ | ○ | ○ | ○ |
| Jogging or running | ○ | ○ | ○ | ○ | ○ |
| Aerobics | ○ | ○ | ○ | ○ | ○ |
| Swimming | ○ | ○ | ○ | ○ | ○ |
| Baseball, softball | ○ | ○ | ○ | ○ | ○ |
| Dance | ○ | ○ | ○ | ○ | ○ |
| Football | ○ | ○ | ○ | ○ | ○ |
| Badminton | ○ | ○ | ○ | ○ | ○ |
| Skateboarding | ○ | ○ | ○ | ○ | ○ |
| Gymnastics | ○ | ○ | ○ | ○ | ○ |
| Street hockey | ○ | ○ | ○ | ○ | ○ |
| Volleyball | ○ | ○ | ○ | ○ | ○ |
| Floor hockey | ○ | ○ | ○ | ○ | ○ |
| Basketball | ○ | ○ | ○ | ○ | ○ |
| Ice skating | ○ | ○ | ○ | ○ | ○ |
| Cross-country skiing | ○ | ○ | ○ | ○ | ○ |
| Ice hockey | ○ | ○ | ○ | ○ | ○ |
| Other: | | | | | |
| _____ | ○ | ○ | ○ | ○ | ○ |
| _____ | ○ | ○ | ○ | ○ | ○ |

- In order to measure and assess levels of physical activity, we applied one of the recommended and widely used questionnaires for children, PAQ-C [Kowalski et al., 2004], after adjusting it for our own purposes.

# STATISTICAL ANALYSES




- IBM SPSS Statistics 19
- One-way ANOVA with Bonferroni post hoc test
- Eta-squared measure of effect size for use in ANOVA ($\eta 2$)
- Statistically significant differences were evaluated at $p < 0.05$, and the data are presented as mean ± SD.


RESULTS
• Following the test verification, the groups were as follows: 27 females and 31 males from Bulgaria, and 8 females and 15 males from England.
Table 1. Anthropometric data of all 81 participants
Table 2. Descriptive characteristics of the modified PAQ-C
TOTAL PAQ-C SCORE

# Table 1. Anthropometric data of all 81 participants

| | Bulgarian Females (n=27) | Bulgarian Males (n=31) | English Females (n=8) | English Males (n=15) |
|---|---|---|---|---|
| Age (y) | 9.0 ± 0.6 | 8.8 ± 0.5 | 8.7 ± 0.4 | 8.6 ± 0.4 |
| Weight (kg) | 34.1 ± 8.0 | 33.0 ± 6.7 | 35.8 ± 13.1 | 34.6 ± 5.8 |
| Weight Z-score | 0.9 ± 1.1 | 0.9 ± 1.3 | 1.2 ± 1.5 | 1.4 ± 0.9 |
| Weight Perc. Score | 71.3 ± 24.5 | 72.1 ± 27.5 | 69.6 ± 25.8 | 86.1 ± 13.7 |
| Height (cm) | 137.0 ± 7.2 | 136.0 ± 7.7 | 136.8 ± 8.3 | 134.4 ± 4.6 |
| Height Z-score | 0.7 ± 0.94 | 0.7 ± 1.2 | 0.9 ± 1.3 | 0.7 ± 0.7 |
| Height Perc. Score | 68.9 ± 25.8 | 68.0 ± 29.9 | 66.4 ± 25.9 | 71.4 ± 20.0 |
| BMI ($kg/m^2$) | 18.0 ± 3.1 | 17.7 ± 2.3 | 19.0 ± 5.4 | 19.1 ± 2.6 |
| BMI Z-score | 0.7 ± 1.1 | 0.8 ± 1.1 | 0.8 ± 1.8 | 1.4 ± 1.0 |
| BMI Perc. Score | 65.2 ± 26.7 | 69.0 ± 27.9 | 50.2 ± 30.1* | 84.7 ± 15.6* |
| Waist circ. (cm) | 64.8 ± 6.2 | 64.3 ± 6.6 | 63.6 ± 10.6 | 64.8 ± 6.3 |
| WHtR | 0.47 ± 0.1 | 0.47 ± 0.1 | 0.46 ± 0.1 | 0.48 ± 0.1 |

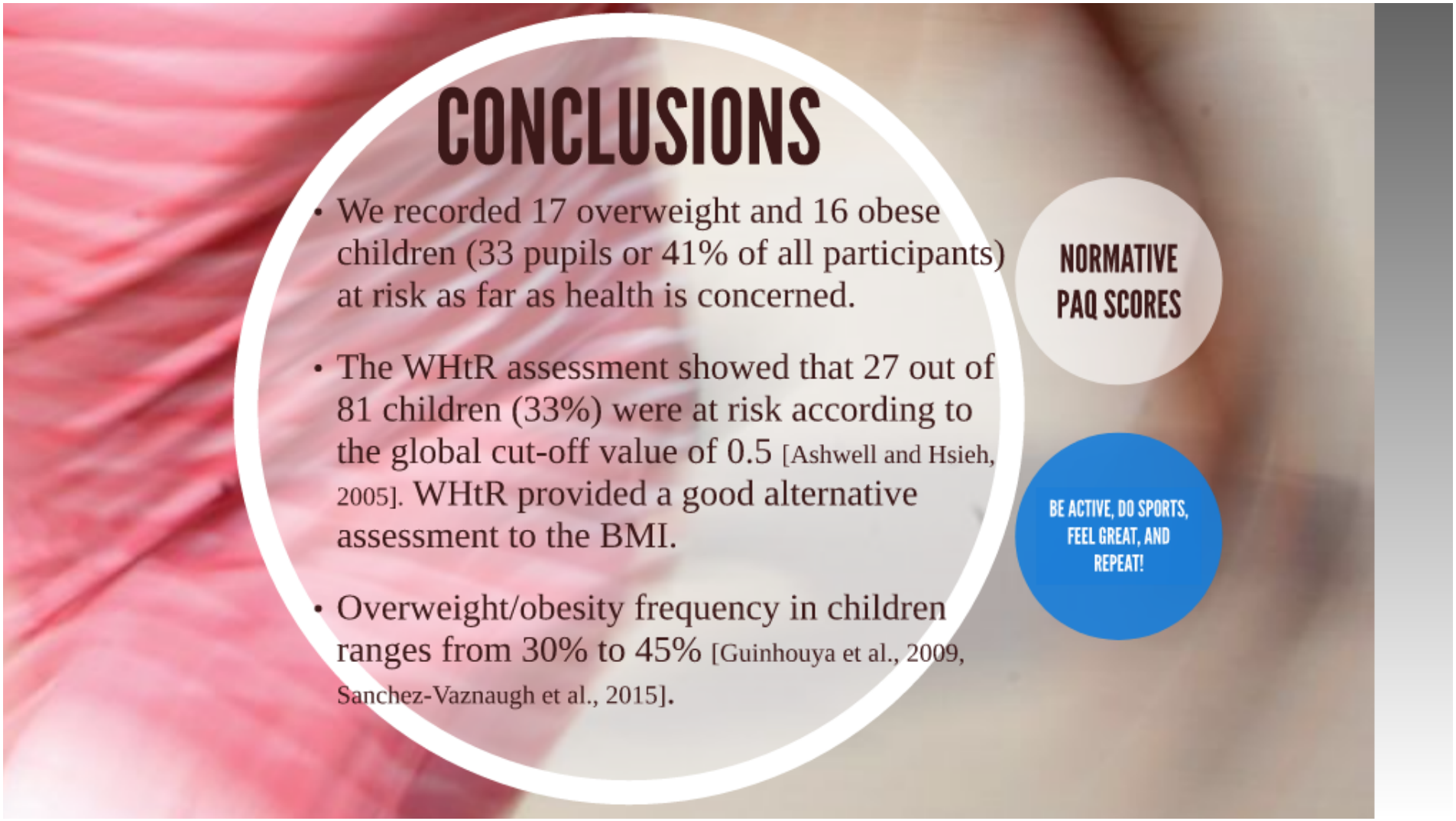
* - $p < 0.05$

# Table 2. Descriptive characteristics of the modified PAQ-C

| | Bulgarian Females (n=27) | Bulgarian Males (n=31) | English Females (n=8) | English Males (n=15) |
|---|---|---|---|---|
| Q1. Spare-time activity: sports | 2.0 ± 0.6 | 2.1 ± 0.2 | 1.9 ± 0.7 | 2.2 ± 0.5 |
| Q2. Activity during physical education classes | 4.8 ± 0.5 c, D | 5.0 ± 0.0 C, D | 4.0 ± 0.8 | 4.1 ± 0.9 |
| Q3. Break-time activity | 2.2 ± 0.7 C, D | 2.8 ± 0.9 C, D | 4.3 ± 1.0 | 4.7 ± 0.6 |
| Q4. Lunch-time activity | 2.6 ± 0.7 C, D | 2.7 ± 0.9 C, D | 4.3 ± 1.0 | 4.3 ± 1.2 |
| Q5. After-school activity | 1.0 ± 0.0 C, D | 1.0 ± 0.0 C, D | 3.1 ± 1.4 | 3.0 ± 1.4 |
| Q6. Evening activity | 3.1 ± 0.7 | 3.3 ± 0.7 | 2.6 ± 1.3 | 2.6 ± 1.1 |
| Q7. Weekend-activity | 2.9 ± 0.6 | 3.1 ± 0.6 | 3.1 ± 1.4 | 3.4 ± 0.9 |
| Q8. Activity frequency | 2.6 ± 0.8 | 3.2 ± 0.9 | 2.1 ± 1.0 | 3.0 ± 1.4 |
| Total PAQ-C activity | 2.66 ± 0.26 c, D | 2.90 ± 0.28 d | 3.17 ± 0.67 | 3.41 ± 0.62 |

$p < 0.001$ vs. Bulgarian Females (A); vs. Bulgarian Males (B); vs. English Females (C); vs. English Males (D)
$p < 0.01$ vs. English Females (c); vs. English Males (d)
$p < 0.05$ vs. English Females (c)
Eta-squared ($\eta 2$) = 0.319 indicates large effects [Cohen, 1988]

- There was no significant difference between overweight and obese children (BMI Z-score > +1SD, n=33) and children with normal weight (BMI Z-score within the norms) in terms of the total PAQ-C score, which was also observed by other authors [Rourke et al., 2003].
- Physical activity (PA) improves many aspects of health, but school-based PA interventions have not been proven to reverse the trend of increased BMI in children according to meta-analysis [Harris et al., 2009].


CONCLUSIONS
• We recorded 17 overweight and 16 obese children (33 pupils or 41% of all participants) at risk as far as health is concerned.
• The WHtR assessment showed that 27 out of 81 children (33%) were at risk according to the global cut-off value of 0.5 [Ashwell and Hsieh, 2005]. WHtR provided a good alternative assessment to the BMI.
• Overweight/obesity frequency in children ranges from 30% to 45% [Guinhouya et al., 2009, Sanchez-Vaznaugh et al., 2015].
NORMATIVE PAQ SCORES
BE ACTIVE, DO SPORTS, FEEL GREAT, AND REPEAT!

# Normative PAQ scores & PAQ Z-scores are needed

- The average total PAQ-C scores for English boys and girls were above the cut-off level (2.9 and 2.7, respectively), which categorises them into either “sufficiently active” or “low-active”, according to normative PAQ scores for English children and adolescents [Voss et al., 2013].
- Further research needs to be carried out in order to obtain normative PAQ scores for Bulgarian children and adolescents.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Sofia 2017
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