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*#MovingSchoolsChallenger*

***Research activities: first report on the students' physical activity and health-related behaviours questionnaire.***



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## I. RESEARCH METHODOLOGY

### I.1. Aims and design of research

One of the main objectives of the Moving Schools Challenger (MsC) project is focused on increasing the daily physical activity of students, as well as enhancing other health behaviors (such as improving diet, reducing sedentary lifestyle, etc.). To verify whether this objective is reached, some research activities have been proposed aimed at corroborating if the students of the participating centers in the MsC program improve their health behaviors.



**Figure 1.** General design of the research activities (students' questionnaire) in the pilot project of the MsC program.

During the 2023/2024 academic year, the pilot study (first phase of the MsC project) has been launched, in which are involving more than a hundred schools from seven European countries: Spain, United Kingdom, Poland,

Bulgaria, Italy, Serbia and Hungary. Among the activities that have been carried out so far, the collection of data, through an online questionnaire, on the students' initial level of physical activity and other health behaviors is included. Thus, all students from the participating centers, aged 6 to 18 years, have been invited to complete a questionnaire at the beginning of the project (September to November 2023).

An identical questionnaire will be administered at the end of the pilot study, when all challenges had been proposed and achieved (Figure 1). Through a comparative analysis of the responses from both instances, our objective is to discern any changes in the students' lifestyles in the period in which the MsC project has been implemented. This research will shed light on the effectiveness of the program in promoting healthy habits among children and adolescents. Accordingly, this deliverable comprises a comprehensive description of the results derived from the analysis of data collected in the initial phase of the pilot study (first students' questionnaire report).

### I.2. Self-report instrument: Students' questionnaire

The responsible partner within the MsC project developed a questionnaire aimed at assessing the levels of physical activity and other health-related behaviors of children and adolescents. The instrument was created based on questionnaires frequently used in scientific research which have a high level of consistency, reliability and validity. Initially, the self-report tool was filled out in English and MsC partners from different countries translated it into the respective specific languages (Spanish, Polish, Bulgarian, Italian, Serbian, and Hungarian language). Each of the questionnaires was implemented on an online platform so that it could be completed in digital format. Teachers from participating schools were instructed and they administered the online questionnaire to their students during school hours. An information sheet was made available to parents as required. The questionnaires ensured anonymity, and responses were systematically coded to maintain consistence and confidentiality.



The final questionnaire was structured on four sections, detailed below (see [Annex 1](#)).

**Section A. General questions:** school center, grade, class, gender, age, and place (urban or rural) where the school and the participant's home are placed.

**Why these questions?**

These questions collect basic demographic characteristics of the students. This valuable information allows us to conduct a nuanced analysis by categorizing results according to diverse characteristics. For example, it allows us to discern how lifestyles may differ based on variables such as gender, age, or the geographical location of the school.

**SECTION B. Physical activity and physical fitness level:** This second section includes three questionnaires designed to evaluate the level of physical activity and the level of physical fitness of young people:

**B.1. Modified PACE+ questionnaire.** The PACE+ is a simple questionnaire that has been frequently used to assess whether children and adolescents accomplish with the WHO physical activity recommendations. It has been validated, against accelerometry, in different countries.<sup>1-2</sup> The WHO physical activity recommendations have been recently updated; while previously it was recommended that children and adolescents do a minimum of 60 minutes each day, the most current WHO guidelines advise that they accumulate an average of at least 60 minutes a day throughout the week. In addition, it is recommended that vigorous intensity activities and strengthening activities be included.<sup>3</sup> For this reason, the PACE+ questionnaire has been slightly modified/extended to adapt it to the new recommendations, consisting of four questions that allow discerning whether students comply with the WHO physical activity recommendations.

**B.2. PAQ-C/A (Physical Activity Questionnaire for Children/Adolescents).** While various questionnaires assess the physical activity levels of young people, the PAQ-C (Physical Activity Questionnaire for Children) stands out as one of the most widely utilized due to its notable consistency, reliability, and validity. Designed for individuals aged 8 to 14 years, the PAQ-C demonstrates high comparability with the PAQ for Adolescents (PAQ-A); the two instruments share identical components, with the exception of a single question omitted in the PAQ-A. Consequently, the PAQ-C version was included in our questionnaire for comprehensive and cohesive assessment. The PAQ-C/A is a self-administered questionnaire designed to measure moderate to vigorous physical activity in children and adolescents, performed in the last 7 days. It consists of ten items, nine of which are used to calculate activity level and the last item assesses whether an illness or other event prevented the child from engaging in regular activities in the last week. The overall result of the test is a continuous score from 1 to 5, with higher scores indicating a higher level of activity. The PAQ-C/A has demonstrated good internal consistency, test-retest reliability, and has been shown to correlate with other instruments that measure physical activity (such as accelerometers). For example, in a recent review and meta-analysis by Marasso et al. aimed to highlight the relationship between physical activity assessed by accelerometer devices and the PAQ-C/A and to estimate the convergent validity of the questionnaire, the authors found significant pooled correlations.<sup>4</sup>



**B.3. IFIS (International Fitness Scale).** Physical fitness is a powerful predictor of detrimental health outcomes in youth; there is evidence that physical fitness is a marker of health in young people and an indirect indicator of physical activity level. Thus, their assessment is of public health interest, and it has been urged to include the evaluation of physical fitness in studies aimed at improving health through the promotion of healthy behaviors. The IFIS scale was included in our questionnaire. This is a very easy self-reported instrument designed to evaluate the overall physical fitness and the main components, such as cardiorespiratory fitness, muscular strength, speed–agility and flexibility. It has been translated into ten different languages (<http://profith.ugr.es/ifis?lang=en>) and has demonstrated a good reliability and validity,<sup>5-6</sup> suggesting that it can be a useful research tool for assessing self-perceived health-related fitness in children and adolescents.

**Why these questions?**

The questions in the section II are highly relevant to the objective of our project. They will allow us to corroborate the level of physical activity of the participants through a widely used and easily comparable questionnaire (i.e., PAQ-C). In addition, we will be able to verify how the percentage of students that meet the WHO PA recommendations varies



**Figure 2.** Current WHO (World Health Organization) recommendations on physical activity for children and adolescents.

(Figure 2). Lastly, we will have a self-reported measure of physical fitness, an indicator highly related to global health in young people (even more than the level of physical activity) and closely related to physical activity. Thus, we will be able to verify if the project has sufficiently influenced the lifestyle of the participants to modify such a powerful health indicator.

**SECTION C. Other Physical activity and physical fitness level:** This third section includes questions designed to evaluate screen time, sleep time and quality of diet.

**C1. Screen time (HBSC).** Excessive sedentary time is considered a behavior detrimental to health. Our project includes the objective of improving different health behaviors and, therefore, verifying whether students' sedentary time is reduced is very relevant. Among sedentary behaviors, there are some that have shown greater detriment to health; for example, screen behaviors, such as television time, have been associated with poorer health in children and adolescents.<sup>7-8</sup> For this reason, the questionnaire includes three simple questions, adapted from the HBSC questionnaire, aimed at evaluating the participants' screen time on weekdays and weekend days.

**C2. Sleep time.** Sleep time and quality has been associated with several health indicators (e.g., inflammation, psychological distress, etc.).<sup>9</sup> On the other hand, it has been suggested a relationship between a higher physical activity level and a healthy quality and duration of sleep. The questionnaire includes a simple general question (used in several previous studies) about sleep time on weekdays and weekend days.



**C3. Quality of diet (KIDMED questionnaire).** In order to evaluate quality of diet, we included the KIDMED questionnaire. This questionnaire has been used for more than a decade by researchers, nutritionists, and educators to evaluate adherence to the Mediterranean Diet (MD) in children and adolescents. A previous study has shown that the KIDMED questionnaire is the most widely used scoring system to assess adherence to the MD in children and adolescents.<sup>10</sup> The KIDMED was developed in 2004 by Serra-Majem et al.<sup>11</sup> Recently, it has been proposed an update of the KIDMED questionnaire by Altavilla et al.<sup>12</sup> and by Lopez-Gajardo et al.<sup>13</sup> However, although these updating proposals are aimed at greater adjustment to the definitions of the MD, they make understanding by children and adolescents more complex (e.g., they use terms such as whole-grain rice). Therefore, it has been considered more appropriate to use the original version of the KIDMED questionnaire. The original version<sup>11</sup> comprises 16-questions denoting a negative or positive connotation with respect to the MD. The index ranged from 0 to 12, so that the questions denoting a negative connotation are assigned a value of -1, and those with a positive aspect +1. The sums of the values are classified into three levels: (i) optimal MD ( $\geq 8$  points), (ii) improvement needed to adjust intake to MD (4-7 points); (iii) very low diet quality ( $\leq 3$  points).

#### Why these questions?

Recently, it has been suggested that interventions considering physical activity, sedentary behavior, sleep and other health-related behaviors, such as diet, could be more effective to improve youth's health.<sup>14-15</sup> These questions will allow us to evaluate whether other health-related behaviors are modified. Physical activity and sedentary time are independent constructs (e.g., a person can be sufficiently active and highly sedentary at the same time; see left image below) and, therefore, they must be evaluated differently. Both sleep time and diet quality has been strongly related to health; so that, evaluating if the intervention could improve this health-related behaviors is relevant.

**SECTION D. Students' perceptions:** This questionnaire includes some perceptions, interests and/or opinions of students about physical activity, sports, school facilities, etc.

### I.3. Statistical analysis

Descriptive statistics are presented as mean and standard deviation for continuous variables, and as frequency and percentage for categorical variables. First, analyses were performed for the entire sample (all participants from all countries), and segmented by gender (i.e., boys and girls) and age group (i.e., children [ $<13$  years] and adolescents [ $\geq 13$  years]) (see section III. Overall results). Differences among groups were assessed using the T-test for independent samples for continuous variables and the Chi-square test for categorical variables.

Next, we performed the analyses segmenting by country; that is comparing results for each variable or composite variable between countries (i.e., Spain, United Kingdom, Poland, Bulgaria, Italy, Serbia and Hungary) (see section IV. Specific results by country). Differences among countries were assessed by one-way analysis of variance (ANOVA) with Bonferroni adjustment for post-hoc (pairwise) comparisons for continuous variables, and by Chi-square test for categorical variables.

All analyses were performed using STATA v.14.0 for Windows (Science Plus Group), with statistical significance set at  $P < 0.05$ . Figures were created using GraphPad Prism v.9.0 software for Windows.



## II. PARTICIPANTS INVOLVED IN THE RESEARCH ACTIVITIES: FIRST STUDENTS' QUESTIONNAIRE

A total of 6,798 students from 71 school centers completed the questionnaire: 3,075 from Spain, 48 from the UK, 588 from Poland, 101 from Bulgaria, 972 from Italy, 1,729 from Serbia, and 285 from Hungary (Table 1).

The age of the participants ranged from 6 to 18 years, with an overall mean (SD) of 12.37 (2.31) years. Significant differences ( $p < 0.05$ ) were found in the mean age of participants among all countries, except between Bulgaria and Hungary ( $p = 0.748$ ), and between Italy and Serbia ( $p = 1.000$ ). Thus, participants with a higher mean age were from Bulgaria, Hungary, and Spain, while participants from the UK and Poland were significantly younger (Table 1).

Approximately half of the participants were boys (50.45%). However, differences were found in the gender distribution among the seven countries ( $p < 0.001$ ). A higher percentage of boys completed the questionnaire in the UK (58.33%) and Hungary (65.61%), while in Bulgaria and Poland, a higher percentage of girls participated (59.41% and 53.06%, respectively) (Table 1).

In the overall sample, the majority of participants were in grades 6 to 8 (52.88%). There were also significant differences in the distribution of the grades of participants across different countries ( $p < 0.001$ ). In Spain, most of participants were in grades 7 to 10 (78.4%), in the UK in grade 4 (54.17%), in Poland in grades 5 to 8 (86.2%), in Bulgaria in grades 10 to 12 (55.3%), in Italy in grades 6 or 7 (76.9%), in Serbia in grades 5 to 8 (55.1%), and in Hungary in grades 8 to 10 (51.1%) (Table 1).

The vast majority of the school centers to which the students completing the questionnaire belong are situated in urban environments (within the city; 86.17%), while only 13.83% of participants attend schools located in rural settings. Once again, differences were observed in the percentages of students attending schools in urban and rural environments among the countries included in the pilot study of the MsC project ( $p < 0.001$ ). The percentage of students studying in schools located in urban settings varies from 63.58% in Italy to 91.9% in Bulgaria, noting that 100% of the participants from the UK attended schools in urban environments (Table 1).

Similarly, most of participants (80.79%) reside in households located in rural environments, with only 19.21% of the participants' homes situated in urban settings. Significant differences between countries were also observed regarding this variable ( $p < 0.001$ ), with the percentage of students living in homes in rural environments ranging from 12.75% in Spain to 33.68% in Hungary. It is worth noting that none (0%) of the participants from the UK live in households situated in rural environments (Table 1).

### Main results:

A total of **6,798 students**, ranging from approximately 6 to 18 years old (mean age: **12.37 years**), from **71 schools** across the **seven countries** involved in this pilot study, completed the questionnaire in the initial administration (pre-intervention). Approximately **half were boys** (50.45%), and **most** of participants were in **grades 6 to 8** (56.7%) and attended schools located in **urban environments** (86.17%). Only 19.21% of participants lived in households situated in rural environments. Significant differences were found in the mean or distribution of all these variables among the different countries.

**Table 1. Main characteristics of participants involved in the research (questionnaire for students), for all sample and by country**

	All	Spain	UK	Poland	Bulgaria	Italy	Serbia	Hungary
<b>Number of schools (n)</b>	71	21	5	13	6	8	9	9
<b>Total students (n)</b>	6798	3075	48	588	101	972	1729	285
<b>Age (mean±SD)<sup>1</sup></b>	12.37±2.31	13.43±2.00	8.81±1.18	10.84±1.78	14.81±2.85	11.21±1.42	11.32±2.08	14.34±2.17
<b>Gender (n, %)<sup>2</sup></b>								
Boys	3428 (50.45)	1518 (49.37)	28 (58.33)	276 (46.94)	41 (40.59)	505 (52.06)	873 (50.52)	187 (65.61)
Girls	3308 (48.68)	1514 (49.24)	20 (41.67)	312 (53.06)	60 (59.41)	465 (47.94)	839 (48.55)	98 (34.39)
Other	59 (0.87)	43 (1.40)	0 (0)	0 (0)	0 (0)	0 (0)	16 (0.93)	0 (0)
<b>Grade (n, %)<sup>3</sup></b>								
Grade 0 (Kindergarten; <6 years)	35 (0.51)	0 (0)	5 (10.42)	30 (5.1)	0 (0)	0 (0)	0 (0)	0 (0)
Grade 1 (6-7 years)	114 (1.68)	3 (0.1)	0 (0)	0 (0)	0 (0)	13 (1.34)	97 (5.61)	1 (0.35)
Grade 2 (7-8 years)	121 (1.78)	3 (0.1)	0 (0)	10 (1.7)	1 (0.99)	0 (0)	107 (6.19)	0 (0)
Grade 3 (8-9 years)	113 (1.66)	6 (0.2)	11 (22.92)	5 (0.85)	4 (3.96)	0 (0)	87 (5.03)	0 (0)
Grade 4 (9-10 years)	252 (3.71)	78 (2.54)	26 (54.17)	9 (1.53)	9 (8.91)	0 (0)	130 (7.52)	0 (0)
Grade 5 (10-11 years)	719 (10.58)	145 (4.72)	6 (12.5)	193 (32.82)	1 (0.99)	0 (0)	351 (20.3)	23 (8.07)
Grade 6 (11-12 years)	1091 (16.05)	124 (4.03)	0 (0)	129 (21.94)	5 (4.95)	506 (52.06)	303 (17.52)	24 (8.42)
Grade 7 (12-13 years)	1393 (20.49)	683 (22.21)	0 (0)	102 (17.35)	14 (13.86)	242 (24.9)	312 (18.05)	40 (14.04)
Grade 8 (13-14 years)	1111 (16.34)	620 (20.16)	0 (0)	84 (14.29)	5 (4.95)	0 (0)	340 (19.66)	62 (21.75)
Grade 9 (14-15 years)	618 (9.09)	554 (18.02)	0 (0)	26 (4.42)	6 (5.94)	0 (0)	1 (0.06)	31 (10.88)
Grade 10 (15-16 years)	626 (9.21)	558 (18.15)	0 (0)	0 (0)	14 (13.86)	0 (0)	1 (0.06)	53 (18.6)
Grade 11 (16-17 years)	343 (5.04)	279 (9.05)	0 (0)	0 (0)	24 (23.76)	0 (0)	0 (0)	40 (14.04)
Grade 12 (17-18 years)	262 (3.85)	22 (0.72)	0 (0)	0 (0)	18 (17.82)	211 (21.71)	0 (0)	11 (3.86)
<b>School zone (n, %)<sup>4</sup></b>								
Urban (in the city)	5858 (86.17)	2794 (90.86)	48 (100)	512 (87.07)	99 (98.02)	658 (67.7)	1488 (86.06)	259 (90.88)
Rural (in the countryside)	940 (13.83)	281 (9.14)	0 (0)	76 (12.93)	2 (1.98)	314 (32.3)	241 (13.94)	26 (9.12)
<b>Students' home zone (n, %)<sup>5</sup></b>								
Urban (in the city)	5492 (80.79)	2683 (87.25)	48 (100)	456 (77.55)	92 (91.09)	618 (63.58)	1406 (81.32)	189 (66.32)
Rural (in the countryside)	1306 (19.21)	392 (12.75)	0 (0)	132 (22.45)	9 (8.91)	354 (36.42)	323 (18.68)	96 (33.68)

Values are presented as frequency (n) and percentage for categorical variables and as mean and standard deviation for continuous variables. Abbreviations: n=number; SD=standard deviation.

<sup>1</sup>p<0.001 for pairwise comparisons between countries (ANOVA test, with Bonferroni post hoc analyses), except between Bulgaria and Hungary (p=0.748), and between Italy and Serbia (p=1.000).

<sup>2</sup>p<0.001 for comparison of sex distribution between countries (Pearson Chi<sup>2</sup>=62.9567).

<sup>3</sup>p<0.001 for comparison of grades distribution between countries (Pearson Chi<sup>2</sup>=6180.56).

<sup>4</sup>p<0.001 for comparison of school zone distribution between countries (Pearson Chi<sup>2</sup>=360.5542).

<sup>5</sup>p<0.001 for comparison of students' home zone distribution between countries (Pearson Chi<sup>2</sup>=329.2858).



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### III. OVERALL RESULTS

#### III.1. Physical activity level

Participants were asked to reflect on the past seven days and report whether they had engaged in at least 60 minutes of physical activity each day throughout the week (yes/no). Additionally, they were requested to specify the number of days in the last week during which they participated in intense physical activities, activities aimed at strengthening muscles and bones, and stretching exercises to lengthen or relax their muscles (ranging from 0 to 7 days).

Overall, 87.08% of the participants reported that they engaged in at least 60 minutes of physical activity each day throughout the last week. Additionally, the mean (SD) number of days on which participants engaged in vigorous activities, strength exercises, and stretching exercises in the last week were 3.67 (1.90), 2.91 (2.02), and 2.99 (2.07), respectively (Table 2). Significant differences were found in the level of physical activity between boys and girls; a lower percentage of girls (85.15%) than boys (88.97%) reported participating in 60 minutes of physical activity per day in the last week ( $p < 0.001$ ). Similarly, girls dedicated fewer days to engaging in vigorous activities ( $3.26 \pm 1.79$  for girls vs.  $4.05 \pm 1.91$  days for boys;  $p < 0.001$ ), strength exercises ( $2.60 \pm 1.89$  for girls vs.  $3.20 \pm 2.08$  days for boys;  $p < 0.001$ ) and stretching exercises ( $2.92 \pm 2.03$  for girls vs.  $3.06 \pm 2.11$  days for boys;  $p = 0.009$ ).

When comparing responses based on age group (children aged  $< 13$  years and adolescents aged  $\geq 13$  years), we observed that a higher percentage of children (88.85%) than adolescents (85.15%) engaged in physical activity for at least 60 minutes per day in the last week ( $p < 0.001$ ). Additionally, younger children, on average, spent more days engaging in vigorous physical activities ( $3.75 \pm 1.94$ ) and strength exercises ( $3.00 \pm 2.02$ ) compared to adolescents ( $3.58 \pm 1.84$  and  $2.81 \pm 2.01$ , respectively; both  $p < 0.001$ ). No significant differences were observed in the performance of stretching exercises between children and adolescents ( $3.03 \pm 2.06$  vs.  $2.95 \pm 2.08$ ;  $p = 0.080$ ) (Table 2).

**Table 2. Physical activity participation in all sample and segmented by gender and age group.**

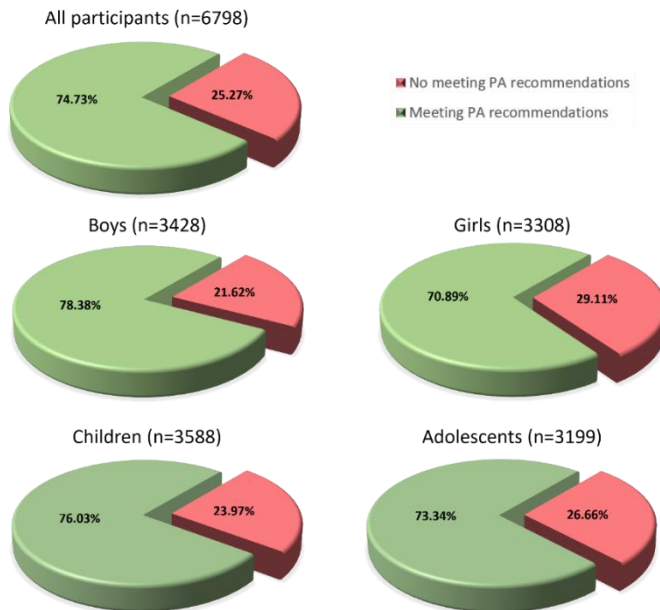
	All	Boys	Girls	P1	Children ( $< 13$ years)	Adolescents ( $\geq 13$ years)	P2
Reaching 60 min/day of PA (n, %)				<b>&lt;0.001</b>			<b>&lt;0.001</b>
No	878 (12.92)	378 (11.03)	491 (14.85)		400 (11.15)	475 (14.85)	
Yes	5919 (87.08)	3050 (88.97)	2816 (85.15)		3188 (88.85)	2723 (85.15)	
VPA (days; mean $\pm$ SD)	3.67 $\pm$ 1.90	4.05 $\pm$ 1.91	3.26 $\pm$ 1.79	<b>&lt;0.001</b>	3.75 $\pm$ 1.94	3.58 $\pm$ 1.84	<b>&lt;0.001</b>
Strengthening exercises (days; mean $\pm$ SD)	2.91 $\pm$ 2.02	3.20 $\pm$ 2.08	2.60 $\pm$ 1.89	<b>&lt;0.001</b>	3.00 $\pm$ 2.02	2.81 $\pm$ 2.01	<b>&lt;0.001</b>
Stretching exercises (days; mean $\pm$ SD)	2.99 $\pm$ 2.07	3.06 $\pm$ 2.11	2.92 $\pm$ 2.03	<b>0.009</b>	3.03 $\pm$ 2.06	2.95 $\pm$ 2.08	0.080

Values are presented as frequency (n) and percentage for categorical variables and as mean and standard deviation for continuous variables.

P1: p-value for differences between boys and girls estimated by Pearson Chi<sup>2</sup> for categorical variables (i.e., reach 60 min/day of PA) and non-paired T-test for continuous variables (i.e., mean days in the last week doing VPA, strengthening, and stretching exercises).

P2: p-value for differences between children ( $< 13$  years) and adolescents ( $\geq 13$  years) estimated by Pearson Chi<sup>2</sup> for categorical variables (i.e., reach 60 min/day of PA) and non-paired T-test for continuous variables (i.e., mean days in the last week doing VPA, strengthening, and stretching exercises).

Abbreviations: PA=Physical Activity; VPA: Vigorous Physical Activity; n=number; SD=standard deviation.



**Figure 3. Percentage of participants meeting physical activity recommendations for all sample and segmented by gender (boys and girls) and age group (children and adolescents).** Significant differences were found in the percentage of compliance with PA recommendations based on gender (Pearson  $\chi^2=50.045$ ;  $p<0.001$ ) and age group (Pearson  $\chi^2=6.513$ ;  $p=0.011$ ). Slight variations are observed in the total number of participants (n) included in the gender and age groups, due to missing or impossible data in grouping variables.

The WHO recommends that children and adolescents accumulate at least 60 minutes of moderate-to-vigorous physical activity throughout the week, combined with the participation in aerobic activities of vigorous intensity and exercises that strengthen muscles and bones at least three days a week (Figure 2). Based on these criteria, participants were classified into those who meet the WHO recommendations for physical activity and those who do not. Overall, 74.73% of the participants met the WHO recommendations for physical activity; this percentage was higher among boys (78.38%) than girls (70.89%;  $p<0.001$ ) and among children (76.03%) compared to adolescents (73.34%;  $p=0.011$ ) (Figure 3).

In the total sample, the most frequently performed physical activity was walking for exercise, followed by bicycling and jogging or running (Table 3). Girls scored higher than boys in in-line skating, walking for exercise, swimming, dance, skateboarding, and volleyball (all  $p<0.05$ ); conversely, boys scored higher in activities such as bicycling, jogging or running, football, racquet sports, soccer, hockey, and skiing (all  $p<0.05$ ). Additionally, boys reported higher participation in physical activities than girls during Physical Education classes, recess, at lunchtime, at early afternoon, in the evenings, as well as in questions regarding the physical activity performed on each day of the last week (Table 3). On the other hand, comparing participants based on age group, boys reported higher average participation in activities such as skipping, tag, bicycling, jogging or running, aerobics, swimming, dance, football, soccer, volleyball, or hockey than adolescents; in contrast, adolescents participated more in baseball, racquet sports, skateboarding, hockey, and skiing (all  $p<0.05$ ). Boys scored higher in all questions related to the level of physical activity in different periods of the previous week (all  $p<0.018$ ).



**Table 3.** Values in PAQ-C/A questions for all participants and segmented by gender and age group.

	All	Boys	Girls	P1	Children (<13 years)	Adolescents (≥13 years)	P2
<b>PAQ-C/A – Q1: specific PAs</b>							
Skiping	1.74±1.08	1.72±1.08	1.76±1.07	0.082	1.98±1.17	1.47±0.90	<0.001
Rowing/canoeing	1.15±0.57	1.14±0.58	1.15±0.54	0.642	1.16±0.58	1.14±0.56	0.122
In-line skating	1.51±0.93	1.46±0.91	1.55±0.94	<0.001	1.56±1.02	1.46±0.82	<0.001
Tag	1.63±1.09	1.69±1.14	1.55±1.03	<0.001	1.70±1.15	1.55±1.01	<0.001
Walking for exercise	2.89±1.40	2.80±1.43	2.98±1.37	<0.001	2.89±1.36	2.89±1.45	0.857
Bicycling	2.33±1.32	2.55±1.38	2.09±1.21	<0.001	2.38±1.37	2.27±1.26	0.001
Jogging or running	2.02±1.28	2.08±1.32	1.97±1.23	0.001	2.31±1.34	1.70±1.13	<0.001
Aerobics	1.27±0.74	1.26±0.73	1.28±0.73	0.266	1.31±0.80	1.22±0.67	<0.001
Swimming	1.48±0.96	1.31±0.79	1.65±1.08	<0.001	1.53±0.99	1.42±0.93	<0.001
Baseball, softball	1.17±0.59	1.18±0.61	1.16±0.54	0.073	1.15±0.57	1.19±0.61	0.005
Dance	1.31±0.82	1.14±0.57	1.48±0.98	<0.001	1.40±0.91	1.21±0.69	<0.001
Football	1.46±0.98	1.66±1.16	1.24±0.68	<0.001	1.55±1.05	1.36±0.88	<0.001
Racket sports	1.65±1.19	1.96±1.41	1.31±0.76	<0.001	1.59±1.15	1.71±1.23	<0.001
Skateboarding	1.30±0.77	1.24±0.68	1.36±0.83	<0.001	1.25±0.70	1.36±0.83	<0.001
Soccer	1.48±1.01	1.74±1.22	1.20±0.62	<0.001	1.62±1.13	1.32±0.83	<0.001
Street hockey	1.44±0.95	1.48±0.97	1.39±0.91	<0.001	1.40±0.93	1.48±0.96	<0.001
Volleyball	1.50±0.97	1.36±0.82	1.65±1.08	<0.001	1.58±1.02	1.42±0.91	<0.001
Floor hockey	1.25±0.68	1.29±0.74	1.20±0.59	<0.001	1.21±0.64	1.29±0.72	<0.001
Basketball	1.57±1.00	1.73±1.12	1.40±0.81	<0.001	1.66±1.04	1.47±0.93	<0.001
Ice skating	1.21±0.68	1.21±0.68	1.20±0.64	0.710	1.22±0.70	1.20±0.64	0.221
Cross-country skiing	1.39±0.89	1.49±1.00	1.27±0.73	<0.001	1.25±0.72	1.56±1.03	<0.001
Ice hockey/ringette	1.15±0.61	1.17±0.63	1.12±0.54	0.003	1.12±0.53	1.19±0.68	<0.001
Other (option 1)	1.81±1.25	1.80±1.26	1.82±1.23	0.493	2.01±1.34	1.59±1.11	<0.001
Other (option 2)	1.26±0.81	1.28±0.85	1.23±0.75	0.032	1.29±0.85	1.23±0.76	0.003
<b>PAQ-C/A – Q2: PA at PE classes</b>	4.06±0.95	4.19±0.90	3.92±0.97	<0.001	4.22±0.85	3.87±1.01	<0.001
<b>PAQ-C/A – Q3: PA at recess</b>	2.48±1.23	2.79±1.32	2.15±1.04	<0.001	2.82±1.29	2.10±1.04	<0.001
<b>PAQ-C/A – Q4: PA at lunch time</b>	1.85±1.18	2.05±1.31	1.63±0.98	<0.001	2.09±1.29	1.57±0.98	<0.001
<b>PAQ-C/A – Q5: PA at early afternoons</b>	2.92±1.30	3.11±1.32	2.73±1.25	<0.001	3.12±1.25	2.71±1.32	<0.001
<b>PAQ-C/A – Q6: PA at evenings</b>	2.88±1.24	3.04±1.26	2.72±1.19	<0.001	2.95±1.21	2.81±1.27	<0.001
<b>PAQ-C/A – Q7: PA at last weekend</b>	2.76±1.15	2.91±1.18	2.60±1.10	<0.001	2.93±1.14	2.56±1.14	<0.001
<b>PAQ-C/A – Q8: general PA at last week</b>	2.89±1.19	3.11±1.21	2.65±1.12	<0.001	3.01±1.18	2.75±1.19	<0.001
<b>PAQ-C/A – Q9: PA level last week by day</b>							
Monday	3.06±1.35	3.23±1.35	2.89±1.32	<0.001	3.15±1.36	2.96±1.34	<0.001
Tuesday	3.10±1.31	3.25±1.30	2.94±1.30	<0.001	3.17±1.31	3.03±1.31	<0.001
Wednesday	3.14±1.33	3.29±1.33	2.98±1.32	<0.001	3.22±1.34	3.06±1.32	<0.001
Thursday	3.14±1.32	3.29±1.30	2.99±1.31	<0.001	3.21±1.31	3.07±1.31	<0.001
Friday	3.28±1.34	3.45±1.32	3.11±1.33	<0.001	3.32±1.36	3.24±1.31	0.018
Saturday	3.16±1.42	3.38±1.41	2.93±1.39	<0.001	3.30±1.40	3.00±1.43	<0.001
Sunday	2.63±1.39	2.81±1.42	2.46±1.32	<0.001	2.83±1.38	2.42±1.36	<0.001

Values are mean and standard deviation. All questions in the PAQ-A questionnaire are registered with a categorical scale ranged from 1 to 5.

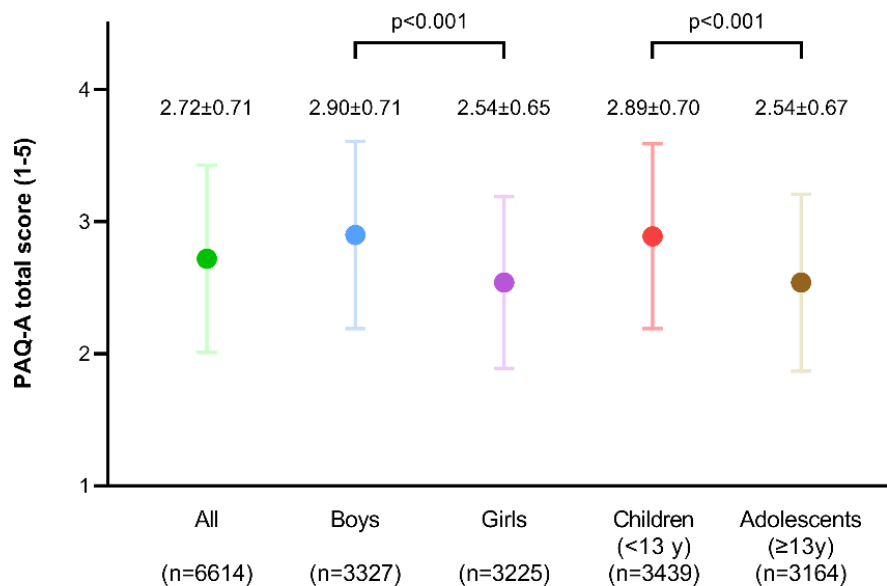
p1: p-value for differences between boys and girls estimated by non-paired T-test.

P2: p-value for differences between children (<13 years) and adolescents (≥13 years) estimated by non-paired T-test.

Abbreviations: PAs=Physical Activities; PAQ-A=Physical Activity Questionnaire for Adolescents. Q=Question.



The overall result of the PAQ-C/A is a continuous score from 1 to 5, with higher scores indicating a higher level of activity. In the total sample, the mean value of the overall PAQ-C/A score was  $2.72 \pm 0.71$  points (Figure 4). A significantly higher score was achieved by boys ( $2.90 \pm 0.71$ ) compared to girls ( $2.54 \pm 0.65$ ;  $p < 0.001$ ). Additionally, children obtained a higher average score ( $2.89 \pm 0.70$ ) than adolescents ( $2.54 \pm 0.67$ ;  $p < 0.001$ ).



**Figure 4. PAQ-C/A total score for all sample and segmented by gender (boys and girls) and age group (children and adolescents).** The circular symbols represent the mean, and the lines the standard deviation in each group. p-values for differences (unpaired T-test) by gender and age group are shown. Slight variations are observed in the total number of participants (n) included in the gender and age groups, due to missing or impossible data in grouping variables.

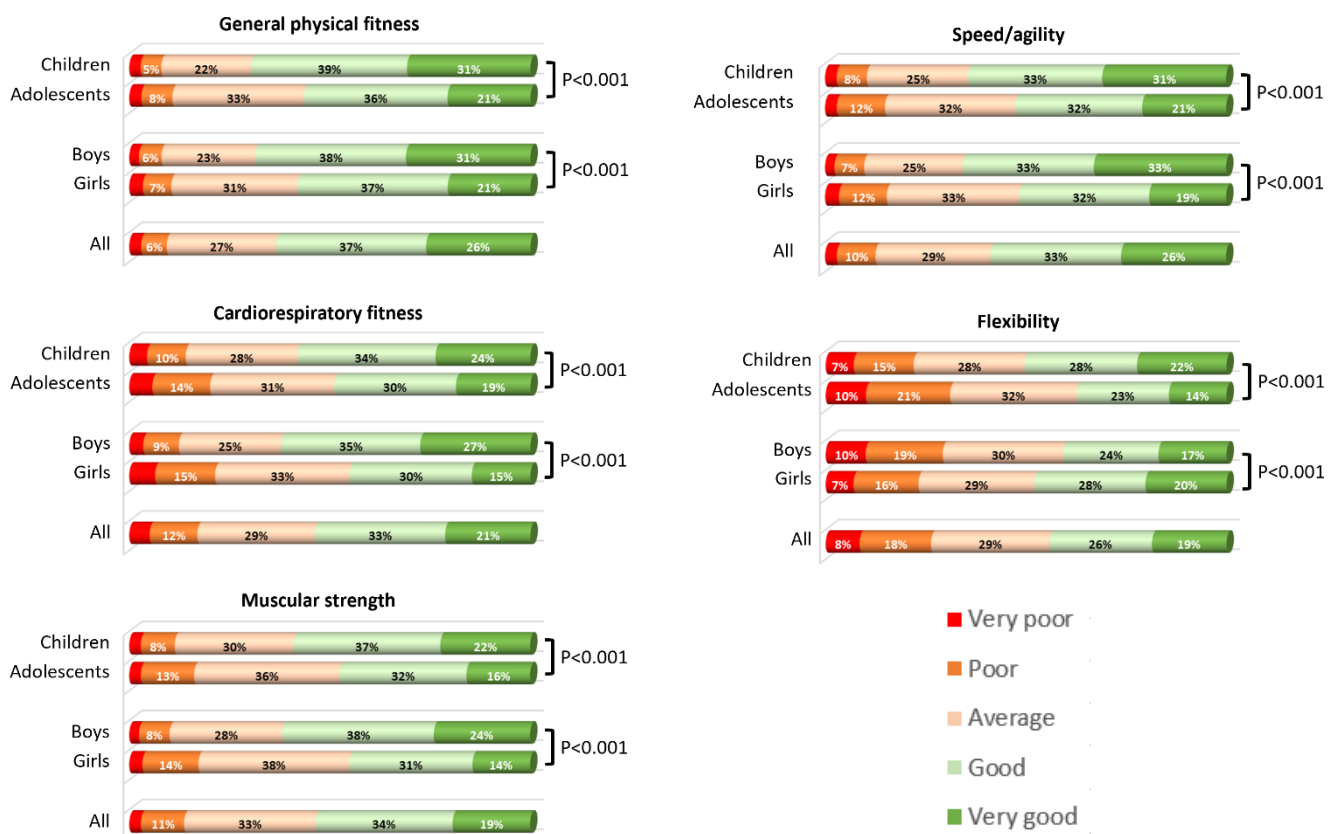
**Main results:**

Almost three-quarters (**74.73%**) of the total sample reported **complying with the WHO physical activity recommendations**, engaging in at least 60 minutes of moderate-to-vigorous physical activity per week, combined with participation in aerobic activities of vigorous intensity and muscle and bone-strengthening activities at least three days a week. The compliance percentage was higher in boys compared to girls and in children compared to adolescents. The total score (ranging from 1 to 5) on the PAQ-C/A questionnaire for the entire sample was 2.72 points; similarly, boys and children obtained higher scores on the questionnaire than girls and adolescents, respectively.



### III.2. Self-reported physical fitness

Self-perceived physical fitness was assessed using the IFIS scale. Overall, 63% of the participants considered their general physical fitness to be good or very good, while only 4% reported very poor general physical fitness (Figure 5). Specifically, 54%, 53%, 59%, and 45% of the participants claimed to have a good or very good level of cardiorespiratory fitness, muscular strength, speed/agility, and flexibility, respectively. Only 5%, 3%, 2%, and 8% of the students reported very poor levels in these fitness indicators, respectively. Significant differences were found in the self-reported physical fitness level based on gender. The percentage of boys reporting high levels of physical fitness was higher in all indicators, except that a increased percentage of girls than boys reported high levels of flexibility. On the other hand, boys perceived themselves to have a better general physical fitness level, cardiorespiratory fitness, muscular strength, speed/agility, and flexibility than adolescents (Figure 5).



**Figure 5.** Self-reported physical fitness level in all sample and by gender and group age. Differences in percentage distribution between groups were calculated by Pearson Chi squared test.

**Main results:**

Most of participants (63%) self-reported a high or very high level of general physical fitness. Broadly, boys and children self-declared greater levels of physical fitness than girls and adolescents, respectively.



### III.3. Other health-related behaviours (screen time, sleep time, and diet)

Participants reported the time spent watching TV/videos or similar, playing videogames, and using social networks (via mobile or computer) on weekdays and weekends, separately. Total screen time was calculated as the sum of the time spent on these three sedentary behaviours. We observed a high screen time; so that, in the total sample, participants reported a mean (SD) of 4.02 (3.43) and 6.09 (4.21) h/day of screen time on weekdays and weekends, respectively. On weekdays, participants spent an average of 1.36 h/day watching TV, 0.84 h/day playing videogames, and 1.82 h/day using social networks. The mean time spent by participants on these behaviours during weekends was 2.14 h/day, 1.59 h/day, and 2.36 h/day, respectively (Table 4).

Boys accumulated more screen time than girls, both on weekdays and weekends (all  $p < 0.001$ ). However, although boys spent more time watching TV and playing videogames than girls (all  $p < 0.001$ ), girls reported significantly more time engaged on social media than boys, both on weekdays and weekends ( $p < 0.001$ ). On the other hand, adolescents accumulated more screen time than children, both on weekdays and weekends (all  $p < 0.001$ ). Thus, adolescents showed significantly more time than children in all sedentary behaviours (i.e., watching TV/videos, playing video games, and using social networks) on both types of days (Table 4).

**Table 4. Screen time in all sample and segmented by gender and age group.**

	All	Boys	Girls	p1	Children (<13 years)	Adolescents (≥13 years)	p2
Total screen time* on weekdays (h/day)	4.02±3.43	4.30±3.61	3.67±3.08	<b>&lt;0.001</b>	3.32±3.06	4.81±3.64	<b>&lt;0.001</b>
Watching TV (h/day)	1.36±1.37	1.42±1.39	1.28±1.31	<b>&lt;0.001</b>	1.29±1.23	1.44±1.51	<b>&lt;0.001</b>
Playing videogames (h/day)	0.84±1.36	1.18±1.51	0.46±1.01	<b>&lt;0.001</b>	0.79±1.23	0.90±1.48	<b>0.002</b>
Using social networks (h/day)	1.82±1.83	1.70±1.78	1.92±1.85	<b>&lt;0.001</b>	1.24±1.49	2.48±1.94	<b>&lt;0.001</b>
Total screen time* on weekend days (h/day)	6.09±4.21	6.70±4.45	5.39±3.76	<b>&lt;0.001</b>	5.07±3.79	7.24±4.37	<b>&lt;0.001</b>
Watching TV (h/day)	2.14±1.75	2.22±1.78	2.06±1.70	<b>&lt;0.001</b>	2.06±1.59	2.24±1.91	<b>&lt;0.001</b>
Playing videogames (h/day)	1.59±1.88	2.31±1.97	0.80±1.37	<b>&lt;0.001</b>	1.39±1.64	1.80±2.09	<b>&lt;0.001</b>
Using social networks (h/day)	2.36±2.07	2.17±2.00	2.54±2.11	<b>&lt;0.001</b>	1.62±1.71	3.20±2.12	<b>&lt;0.001</b>

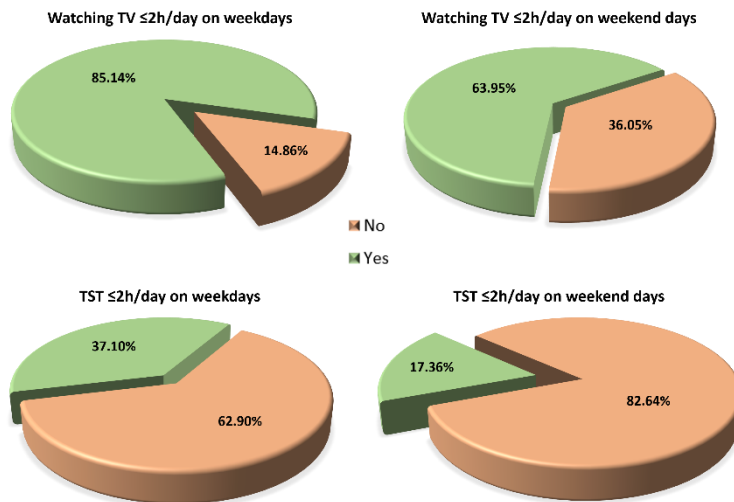
Values are mean and standard deviation. \*Total screen time was estimated as the sum of time spending watching TV, playing videogames and using social networks.

p1: p-value for differences between boys and girls estimated by non-paired T-test.

P2: p-value for differences between children (<13 years) and adolescents (≥13 years) estimated by non-paired T-test.

Abbreviations: TV=Television.

The WHO recommends limiting the amount of time spent on sedentary behaviors (Figure 2). Various health-related organizations suggest that children and adolescents should not spend more than two hours per day watching TV; other guidelines include additional sedentary behaviors, stating that young people should not accumulate more than 2 hours per day of screen time. Participants were classified based on whether they met the screen time recommendations, so if they reported two or fewer hours of TV per day, they were considered to meet the recommendations for that behavior. Similarly, if



**Figure 6. Compliance with sedentary time recommendations (TV time and TST) in the total sample.** Abbreviations: TST=Total Screen Time (calculated as the sum of time watching TV, playing videogames and using social networks); TV=Television.

they accumulated two or fewer hours of total screen time, they were considered to meet the recommendations for screen time. About 85.14% and 63.95% of the participants met the maximum TV time recommendations on weekdays and weekends, respectively; however, 62.90% and 82.64% accumulated two or more hours of screen time during weekdays and weekends, respectively. Thus, only 37.10% and 17.36% of the participants met the maximum total screen time recommendations on weekdays and weekends, respectively (Figure 6).

When analyzing by gender, no differences were found in the proportion of boys and girls meeting the TV recommendations ( $\leq 2$ h/day) on weekdays ( $p=0.062$ ); however, a higher percentage of girls than boys met the maximum TV time recommended on weekends ( $p<0.001$ ); more girls than boys reached recommendations about total screen time ( $\leq 2$ h/day) on weekdays ( $p<0.001$ ) and weekend days ( $p=0.005$ ). On the other hand, the percentage meeting the TV or total screen time recommendations is significantly higher among children compared to adolescents (all  $p<0.010$ ). For example, only 10.07% of adolescents met the recommendation of  $\leq 2$ h/day of total screen time on weekends, while 23.77% of children achieved this recommendation (Table 5).

**Table 5. Compliance with sedentary time recommendations (TV time and TST) by gender and age group.**

	Boys	Girls	p1	Children (<13 years)	Adolescents ( $\geq 13$ years)	p2
Meet TV recommendation ( $\leq 2$ h/day) on weekdays (n, %)	2896 (84.48)	2848 (86.09)	0.062	3160 (88.07)	2619 (81.87)	<0.001
Meeting TST* recommendation ( $\leq 2$ h/day) on weekdays (n, %)	1151 (33.58)	1360 (41.11)	<0.001	1683 (46.91)	833 (26.04)	<0.001
Meet TV recommendation ( $\leq 2$ h/day) on weekend days (n, %)	2141 (62.46)	2174 (65.72)	0.005	2345 (65.36)	1995 (62.36)	0.010
Meeting TST* recommendation ( $\leq 2$ h/day) on weekend days (n, %)	489 (14.26%)	685 (20.71)	<0.001	853 (23.77)	322 (10.07)	<0.001

Values are frequency (n) and percentage of participants in all sample and by gender and age groups meeting recommendations.

\*Total screen time was estimated as the sum of time spending watching TV, playing videogames and using social networks.

p1: p-value for differences between boys and girls estimated by Pearson Chi<sup>2</sup>.

P2: p-value for differences between children (<13 years) and adolescents ( $\geq 13$  years) estimated by Pearson Chi<sup>2</sup>.

Abbreviations: TST=Screen Time; TV=Television SD=standard deviation.



**Table 6.** Usual sleep time (h/day) on weekdays and weekend days in all sample and by gender and age group.

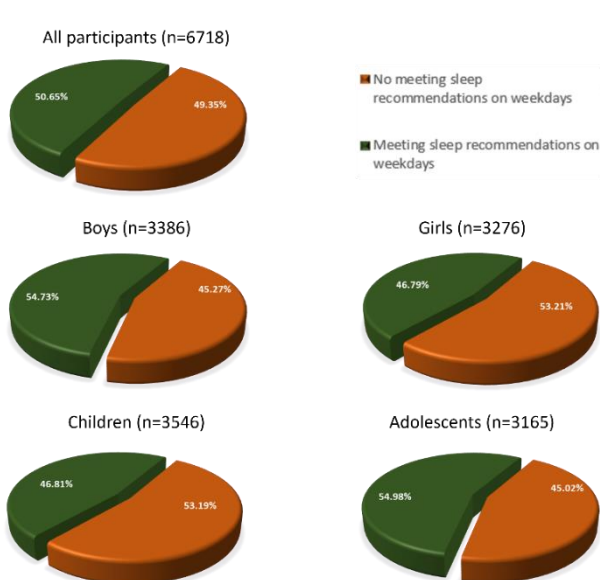
	All	Boys	Girls	P1	Children (<13 years)	Adolescents (≥13 years)	P2
Usual sleep time on weekdays (h/day)	8.06±1.32	8.18±1.27	7.95±1.34	<0.001	8.48±1.20	7.59±1.30	<0.001
Usual sleep time on weekend days (h/day)	9.38±1.64	9.32±1.63	9.44±1.66	0.004	9.48±1.56	9.26±1.72	<0.001

Values are mean and standard deviation.

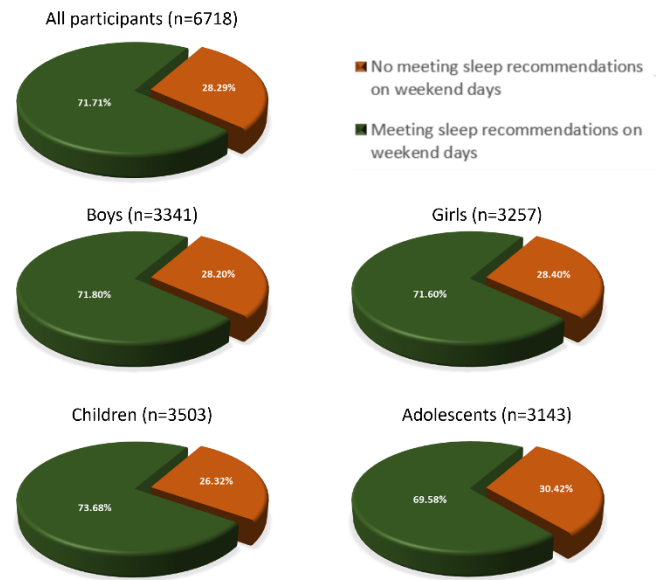
p1: p-value for differences between boys and girls estimated by non-paired T-test.

P2: p-value for differences between children (<13 years) and adolescents (≥13 years) estimated by non-paired T-test.

Regarding sleep time, the Sleep Foundation (<https://www.sleepfoundation.org/>) recommends that children between 6 and 12 years old should sleep 6-12 hours per day, while adolescents aged 13 to 18 should accumulate a sleep time between 8 and 10 hours. In our entire sample, the mean (SD) sleep time was 8.06 (1.32) and 9.38 (1.64) hours per day on weekdays and weekends, respectively. Girls accumulate less sleep time than boys on weekdays ( $p < 0.001$ ), but more on weekends ( $p = 0.004$ ) than boys. Adolescents reported significantly less sleep time than children, both on weekdays and weekends (all  $p < 0.001$ ) (Table 6). Thus, approximately half of the participants (50.65%) meet the sleep time recommendations on weekdays (Figure 7), and 71.71% meet them on weekends (Figure 8). A higher percentage of boys than girls accumulated recommended sleep time on weekdays (54.73% vs. 46.79%;  $p < 0.001$ ). A higher percentage of adolescents (54.98%) than children (46.81%) meet the sleep time recommendations on weekdays; however, the percentage of children (73.68%) meeting sleep recommendations on weekends is higher than that of adolescents (69.58%; all  $p > 0.001$ ).



**Figure 7.** Compliance with sleep time recommendations on weekdays in the total sample and segmented by gender and age group. Significant differences were found in the percentage of compliance with sleep time recommendations on weekdays based on gender (Pearson  $\chi^2 = 41.90$ ;  $p < 0.001$ ) and age group (Pearson  $\chi^2 = 44.58$ ;  $p < 0.001$ ).



**Figure 8.** Compliance with sleep time recommendations on weekend days in the total sample and segmented by gender and age group. No differences were found in the percentage of compliance with sleep time recommendations on weekend days based on gender (Pearson  $\chi^2 = 0.03$ ;  $p = 0.853$ ), but significant differences were found between age groups (Pearson  $\chi^2 = 13.71$ ;  $p < 0.001$ ).



**Table 7** shows the percentage of participants from the total sample, as well as segmented by gender and age group, with affirmative responses to items in the KIDMED questionnaire, aimed to assessing the quality of the Mediterranean diet. Among the positive items, the highest percentages were found for eating a piece of fruit daily, using olive oil at home for cooking, and eating cereal or cereal products for breakfast (over 70% of the total sample responded affirmatively to all these items). Among the negatively connoted items, 26.27% reported going to fast-food restaurants one or more times a week, 20.82% do not have breakfast every day, while 72.38% eat commercially baked goods or pastries (e.g., cookies, cakes, croissants, donuts) for breakfast, and 37.44% consume sweets and candies several times a day. Several differences were found between boys and girls and across age groups in individual items (**Table 7**).

**Table 7. KIDMED questionnaire (responses by question) for total sample and segmented by gender and age groups**

	All	Boys	Girls	p1	Children (<13 years)	Adolescents (≥13 years)	p2
Do you eat a piece of fruit or drink fresh fruit juice every day?	5197 (76.87)	2580 (75.82)	2573 (77.97)	<b>0.037</b>	2863 (80.24)	2326 (73.05)	<b>&lt;0.001</b>
Do you eat a second piece of fruit every day?	3391 (50.23)	1720 (50.62)	1647 (50.02)	0.622	2027 (56.95)	1356 (42.61)	<b>&lt;0.001</b>
Do you eat fresh vegetables (example: salads) or cooked vegetables (example: soup) regularly, one a day?	5068 (74.94)	2461 (72.25)	2570 (77.95)	<b>&lt;0.001</b>	2724 (76.35)	2335 (73.31)	<b>0.004</b>
Do you eat fresh or cooked vegetables more than once a day?	3003 (44.48)	1437 (42.23)	1532 (46.59)	<b>&lt;0.001</b>	1628 (45.63)	1366 (43.05)	<b>0.034</b>
Do you eat fish/seafood (e.g., hake, sardines, octopus, shrimp) at least 2 to 3 times a week?	3302 (48.99)	1685 (49.59)	1587 (48.35)	0.313	1721 (48.37)	1573 (49.59)	0.318
Do you go, once or more a week, to fast-food restaurants like hamburger places?	1774 (26.27)	956 (28.08)	798 (24.27)	<b>&lt;0.001</b>	810 (22.75)	960 (30.16)	<b>&lt;0.001</b>
Do you like and eat pulses (e.g., beans, peas, chickpeas, broad beans, lentils) more than once a week?	4543 (67.41)	2281 (67.07)	2220 (67.72)	0.568	2353 (66.15)	2182 (68.79)	<b>0.021</b>
Do you eat pasta or rice almost every day (5 days or more a week)?	3228 (47.93)	1716 (50.49)	1484 (45.3)	<b>&lt;0.001</b>	1629 (45.86)	1590 (50.11)	<b>0.001</b>
Do you eat nuts (e.g., walnuts, almonds, hazelnuts) regularly (at least 2-3 times a week)?	3046 (45.10)	1560 (45.81)	1458 (44.33)	0.222	1538 (43.12)	1501 (47.25)	<b>0.001</b>
Do you use olive oil at home?	5367 (79.46)	2660 (78.17)	2661 (80.86)	<b>0.006</b>	2785 (78.21)	2572 (80.8)	<b>0.009</b>
Do you take breakfast every day?	5351 (79.18)	2885 (84.65)	2424 (73.63)	<b>&lt;0.001</b>	3078 (86.19)	2264 (71.26)	<b>&lt;0.001</b>
Do you eat cereal or cereal products (e.g., oats, bread) for breakfast?	4850 (71.96)	2500 (73.57)	2310 (70.38)	<b>0.004</b>	2610 (73.48)	2231 (70.2)	<b>0.003</b>
Do you eat dairy products (yogurt, milk, cheese) for breakfast?	4033 (59.67)	2047 (60.15)	1955 (59.31)	0.484	2388 (67.02)	1638 (51.41)	<b>&lt;0.001</b>
Do you eat commercially baked goods or pastries (e.g., cookies, cakes, croissants, donuts) for breakfast?	4867 (72.38)	2491 (73.44)	2328 (71.15)	<b>0.037</b>	2449 (69.04)	2411 (76.1)	<b>&lt;0.001</b>
Do you eat 2 yogurts and/or some cheese (about 40 g) daily?	3684 (54.63)	1913 (56.23)	1732 (52.77)	<b>0.005</b>	1878 (52.81)	1798 (56.59)	<b>0.002</b>
Do you eat sweets and candies several times a day (e.g., chocolates, gums, sweets)?	2518 (37.44)	1229 (36.24)	1265 (38.63)	<b>0.044</b>	1378 (38.87)	1134 (35.76)	<b>0.009</b>

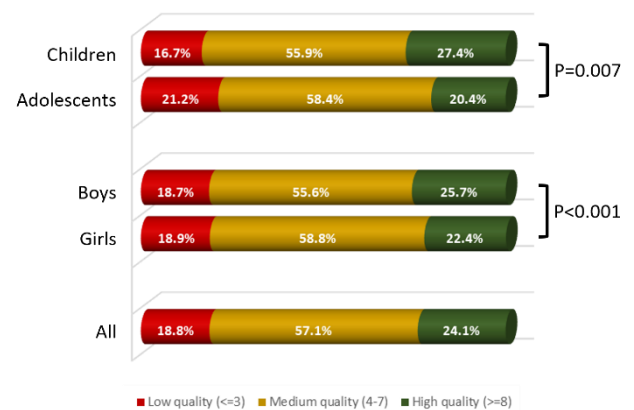
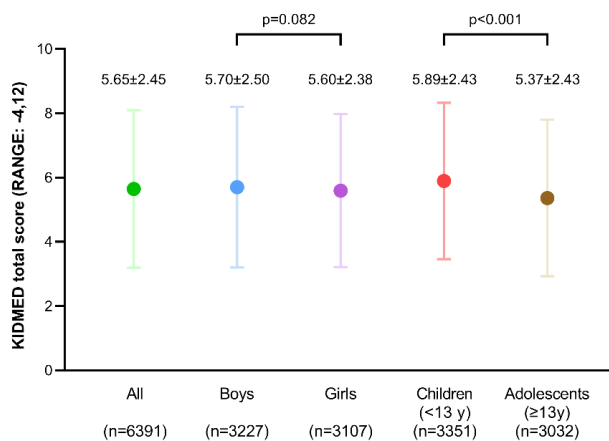
Values are frequency (n) and percentage of participants who responded affirmatively (yes) in each question of KIDMED questionnaire. All questions in the KIDMED questionnaire are binomial categorical (yes/no).

p1: p-value for differences between boys and girls estimated by Pearson Chi<sup>2</sup>.

P2: p-value for differences between children (<13 years) and adolescents (≥13 years) estimated by Pearson Chi<sup>2</sup>.



Thus, the mean total score (SD) of the KIDMED questionnaire (ranging from -4 to 12) was 5.65 (2.45) in the total sample. No significant differences were found in the mean total KIDMED score achieved by boys (5.70±2.50) and girls (5.60±2.38; p=0.082). However, children obtained a significantly higher mean score for the Mediterranean diet (5.89±2.43) than adolescents (5.37±2.43; p<0.001) (Figure 9). Based on the KIDMED questionnaire score, the quality of the Mediterranean diet was classified as low quality (≥3 points), medium quality (4-7 points), and high quality (≤8 points). It was observed that 18.8%, 57.1%, and 24.1% of the total participants have low, medium, and high-quality diets, respectively (Figure 10). A higher percentage of boys (25.5%) than girls (22.4%; p<0.001) had a high-quality diet. Additionally, a significantly higher percentage of children (27.4%) than adolescents (20.4%) reported having a high-quality diet (p=0.007).



**Figure 9.** KIDMED total score for all sample and segmented by gender (boys and girls) and age group (children and adolescents). The circular symbols represent the mean, and the lines the standard deviation in each group. p-values for differences (unpaired T-test) by gender and age group are shown. Slight variations are observed in the total number of participants (n) included in the gender and age groups, due to missing or impossible data in grouping variables.

**Figure 10.** Percentage of participants with low, medium and high quality of diet (KIDMED) in all sample and by gender and group age. Differences in percentage distribution between groups were calculated by Pearson Chi squared

**Main results:**

Only 37.10% and 17.36% of the participants meet the recommendations of not accumulating more than 2 hours per day of screen time on weekdays and weekends, respectively. Overall, a higher percentage of girls and children reached screen time recommendations compared to boys and adolescents, respectively.

Approximately half of the participants (50.65%) met the sleep time recommendations. More children reach sleep recommendations on weekends, but adolescents on weekdays.

The mean total score on the KIDMED questionnaire for diet quality (ranging from -4 to 12) was 5.65 for the entire sample, with 24.1% classified as having a high-quality diet. Children obtained a higher mean score than adolescents (5.89 vs. 5.37) on the KIDMED questionnaire; a higher percentage of boys (25.7%) than girls (22.4%), and of children (27.4%) than adolescents (20.4%), reported having a high-quality diet.



### III.4. Perceptions, interests and opinions about physical activity and other related factors.

The participants were asked about their perceptions, interests, and opinions regarding physical activity and other associated factors (e.g., school sports context) (Table 8). Most of students reported completely agreeing that they enjoy participating in sports at school (73%), have access to a big gym for sports (71.8%), and the school provides materials and equipment for sports (78.1%). Additionally, a high percentage of participants completely agreed that engaging in sports makes them feel in better physical (82.4%) or mental (73.3%) conditions, and helps them make new friends (72.9%) and learn the basic values of fair play (75.3%). The lowest percentages of completely agreed responses were found in statements related to the school organizing numerous sports activities (57.1%), teachers assigning high value to school sports (63.8%), sports help in develop their personality (63.8%), and would like to increase Physical Education hours during school time.

Differences in perceptions and opinions between boys and girls were observed. Notably, only 65.4% of girls, compared to 80.6% of boys, reported enjoying playing sports at school ( $p < 0.001$ ). While 85.2%, 76.1%, and 67.9% completely agreed that playing sports helps them feel better physically and mentally and aids in personality development, respectively, only 79.8%, 70.1%, and 59.8% of girls completely agreed with these statements (all  $p < 0.001$ ). The most significant gender difference was related to increasing Physical Education hours, with 79.2% of boys fully supporting it compared to only 56% of girls who completely agreed ( $p < 0.001$ ).

Much larger differences were found when comparing the attitudes and perceptions of children and adolescents, with a significantly higher percentage of children than adolescents completely agreeing with all statements. Notably, 84.5% of children enjoy practicing sports at school, compared to only 60% of adolescents ( $p < 0.001$ ). Furthermore, a higher percentage of children than adolescents completely agreed that they would like to increase Physical Education hours (76.5% vs. 58.8%;  $p < 0.001$ ), that sports in and outside school help learn the basic values of fair play (82.6% vs. 67.2%,  $p < 0.001$ ), and that their teachers assign high value to school sports (69.5% vs. 57.4%).

#### Main results:

A substantial proportion of participants demonstrated positive attitudes toward physical activity and acknowledged the presence of school facilities that promote engagement in sports. In general, a greater percentage of boys and children expressed more favorable opinions compared to girls and adolescents.

### IV. SPECIFIC RESULTS BY COUNTRY

In this concluding section, we present the results from the research activities (i.e., students' questionnaire) segmented for each country involved in the pilot study (academic year 2023/2014; inaugural year of the MSc project): Spain, United Kingdom, Poland, Bulgaria, Italy, Serbia, and Hungary. It should be noted that caution is essential when interpreting these results given that they are crude results without adjustment for potential confounding factors such as age or gender. Nonetheless, as detailed in Section II of this report, notable disparities exist among participants from the different countries in terms of percentage distribution by gender and age range of participants. Further, the number of students who completed the questionnaire in each country was highly variable.



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**Table 8.** Percentage of participants responded “completely agree”, “no attitude” and “completely disagree” in the questions about interest and opinions about physical activity and related factors, for all sample and by gender and age group.

	All (agree/no attitude/ disagree, %)	Boys (agree/no attitude/ disagree, %)	Girls (agree/no attitude/ disagree, %)	P1	Children (<13 years) (agree/no attitude/ disagree, %)	Adolescents (≥13 years) (agree/no attitude/ disagree, %)	P2
Do you like play sport in school?	73.0 / 22.5 / 4.5	80.6 / 16.2 / 3.1	65.4 / 29.0 / 5.7	<b>&lt;0.001</b>	84.5 / 13.3 / 2.2	60.0 / 32.9 / 7.1	<b>&lt;0.001</b>
Does your school organize lots of sport activities?	57.1 / 33.1 / 9.8	54.7 / 33.9 / 11.5	59.9 / 32.1 / 8.0	<b>&lt;0.001</b>	61.7 / 29.0 / 9.4	52.2 / 37.6 / 10.3	<b>&lt;0.001</b>
Do you have a big gym where to play sport in school?	71.8 / 18.1 / 10.2	70.0 / 18.7 / 11.3	73.9 / 17.2 / 8.9	<b>0.001</b>	76.8 / 13.7 / 9.5	66.1 / 22.9 / 10.9	<b>&lt;0.001</b>
Does your school have lots of sport materials/equipment (balls, cones, racquets, nets...)	78.1 / 16.6 / 5.3	77.5 / 17.1 / 5.4	78.9 / 16.0 / 5.1	0.398	81.7 / 13.3 / 5.0	74.3 / 20.3 / 5.5	<b>&lt;0.001</b>
In your opinion, does your school teachers give high values to school sports?	63.8 / 29.5 / 6.8	63.4 / 28.9 / 7.8	64.5 / 29.9 / 5.6	<b>0.002</b>	69.5 / 25.3 / 5.2	57.4 / 34.1 / 8.5	<b>&lt;0.001</b>
Playing sport in and outside school time helps you to fell in better physical conditions?	82.4 / 13.7 / 3.9	85.2 / 11.5 / 3.3	79.8 / 15.7 / 4.5	<b>&lt;0.001</b>	86.2 / 10.9 / 2.9	78.1 / 16.9 / 5.1	<b>&lt;0.001</b>
Playing sport in and outside school time helps you to fell in better mental conditions?	73.3 / 20.8 / 5.9	76.7 / 18.3 / 5.0	70.1 / 23.2 / 6.8	<b>&lt;0.001</b>	77.8 / 18.2 / 4.0	68.3 / 23.7 / 8.1	<b>&lt;0.001</b>
Playing sport in and outside school time helps you in the development of your personality?	63.8 / 27.1 / 9.2	67.9 / 24.6 / 7.6	59.8 / 29.6 / 10.6	<b>&lt;0.001</b>	69.7 / 23.2 / 7.1	57.1 / 31.4 / 11.5	<b>&lt;0.001</b>
Playing sport in and outside school time helps you to socialize with people and make new friends?	72.9 / 19.7 / 7.4	75.3 / 18.2 / 6.5	70.8 / 20.9 / 8.3	<b>&lt;0.001</b>	77.6 / 16.4 / 6.0	67.8 / 23.2 / 9.0	<b>&lt;0.001</b>
Playing sport in and outside school time helps you to learn the basic values of fair play (such as respect rules, do not cheat, helps others?)	75.3 / 18.9 / 5.8	77.2 / 17.6 / 5.1	73.7 / 20.1 / 6.2	<b>0.003</b>	82.6 / 13.5 / 4.0	67.2 / 25.1 / 7.8	<b>&lt;0.001</b>
Would you like to increase the hours of Physical Education during the school time?	68.1 / 18.1 / 13.8	79.2 / 13.5 / 7.2	56.9 / 22.7 / 20.4	<b>&lt;0.001</b>	76.5 / 14.1 / 9.4	58.8 / 22.5 / 18.7	<b>&lt;0.001</b>

P1: p-value for differences between boys and girls estimated by Pearson Chi<sup>2</sup>.

P2: p-value for differences between children (<13 years) and adolescents (≥13 years) estimated by Pearson Chi<sup>2</sup>.



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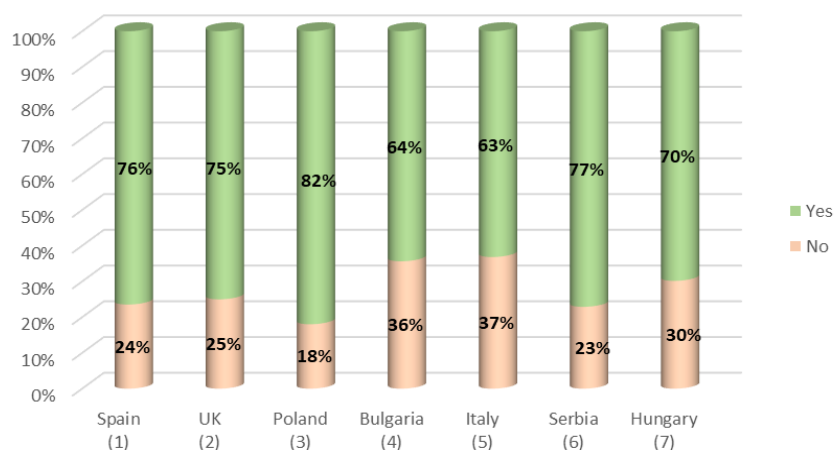
### IV.1. Physical activity level by country

As can be seen in Table 9, the percentage of students who engage in a minimum of 60 minutes of physical activity per day varied among countries ( $p < 0.001$ ), ranging from 78.81% in Italy to 93.75% in the UK. Similarly, significant differences were observed in the average number of days students engage in vigorous physical activities (from  $2.93 \pm 2.15$  in Bulgaria to  $4.06 \pm 1.94$  in Poland), strengthening exercises (from  $2.19 \pm 1.67$  in Italy to  $3.65 \pm 2.11$  in Poland), or stretching exercises (from  $2.08 \pm 1.77$  in Italy to  $3.51 \pm 2.08$ ). Thus, the percentage of participants meeting the WHO recommendations for physical activity was 76%, 75%, 83%, 64%, 65%, 77%, and 70% in Spain, the UK, Poland, Bulgaria, Italy, Serbia, and Hungary, respectively (Figure 11).

**Table 9. Physical activity participation by country**

	Spain (1)	UK (2)	Poland (3)	Bulgaria (4)	Italy (5)	Serbia (6)	Hungary (7)	P1
Reaching 60 min/day of PA (n, %)								
No	382 (12.42)	3 (6.25)	57 (9.69)	11 (10.89)	206 (21.19)	178 (10.29)	41 (14.44)	<b>&lt;0.001</b> 1-5, 1-6, 2-5, 3-5, 3-7, 4-5, 5-6, 5-7, 6-7
Yes	2693 (87.58)	45 (93.75)	531 (90.31)	90 (89.11)	766 (78.81)	1551 (89.71)	243 (85.56)	
VPA (days; mean $\pm$ SD)	3.84 $\pm$ 1.81	4.02 $\pm$ 1.96	4.06 $\pm$ 1.94	2.93 $\pm$ 2.15	3.08 $\pm$ 1.64	3.66 $\pm$ 2.05	3.17 $\pm$ 1.94	<b>&lt;0.001</b> 1-4, 1-5, 1-6, 1-7, 2-4, 2-5, 3-4, 3-5, 3-6, 3-7, 4-6, 5-6, 6-7
Strengthening exercises (days; mean $\pm$ SD)	2.75 $\pm$ 1.97	3.19 $\pm$ 2.18	3.65 $\pm$ 2.11	2.59 $\pm$ 2.06	2.19 $\pm$ 1.67	3.38 $\pm$ 2.07	2.86 $\pm$ 1.99	<b>&lt;0.001</b> 1-3, 1-5, 1-6, 2-5, 3-4, 3-7, 4-6, 5-6, 5-6, 6-7
Stretching exercises (days; mean $\pm$ SD)	2.9 $\pm$ 2.01	3.46 $\pm$ 2.14	3.51 $\pm$ 2.08	2.63 $\pm$ 2.17	2.08 $\pm$ 1.77	3.50 $\pm$ 2.14	3.00 $\pm$ 2.05	<b>&lt;0.001</b> 1-3, 1-5, 1-6, 2-5, 3-4, 3-5, 3-7, 4-6, 5-6, 5-7, 6-7

Values are presented as frequency (n) and percentage for categorical variables and as mean and standard deviation for continuous variables. P1: p-value for differences between boys and girls estimated by Pearson Chi2 for categorical variables (i.e., reach 60 min/day of PA) and ANOVA test for continuous variables (i.e., mean days in the last week doing VPA, strengthening, and stretching exercises). Pairwise differences between countries were estimated analysing adjusted residuals to determine where the largest differences between observed and expected counts arose in the Chi2 test for categorical variables; and applying post-hoc analysis (Bonferroni) in the ANOVA test for continuous variables. Pairwise differences are specified in the last column (i.e., 1-2 means that there are differences between Spain and UK). Abbreviations: PA=Physical Activity; VPA: Vigorous Physical Activity; n=number; SD=standard deviation; UK=United Kingdom.



**Figure 11. Percentage of participants meeting physical activity recommendations by country.** Significant differences in the percentage of compliance with PA recommendations by country were found (Pearson  $\chi^2=104.49$ ;  $p < 0.001$ ). Pairwise comparisons showed differences between: 1-3, 1-4, 1-5, 1-7, 3-4, 3-5, 3-6, 3-7, 4-6, 4-7, 5-6, 5-7, and 6-7.



**Table 10. Values in PAQ-A questions by country**

	Spain	UK	Poland	Bulgaria	Italy	Serbia	Hungary
<b>PAQ-A -1: specific PAs</b>							
Skipping	1.33±0.76	1.63±1.14	1.47±0.91	1.47±0.84	2.97±1.16	1.89±1.05	1.71±0.98
Rowing/canoeing	1.24±0.72	1.06±0.43	1.14±0.53	1.04±0.28	1.04±0.29	1.07±0.39	1.09±0.45
In-line skating	1.91±1.07	1.10±0.37	1.58±1.04	1.08±0.39	1.10±0.48	1.11±0.48	1.18±0.63
Tag	1.75±1.19	2.60±1.25	2.70±1.34	1.67±0.93	1.09±0.46	1.24±0.64	2.02±1.00
Walking for exercise	2.95±1.5	3.52±1.35	2.88±1.32	2.69±1.20	3.10±1.23	2.52±1.27	3.72±1.24
Bicycling	2.55±1.31	2.33±1.45	2.43±1.41	1.46±0.86	1.94±1.19	2.19±1.29	2.19±1.32
Jogging or running	1.28±0.76	3.33±1.42	3.22±1.32	1.91±1.05	2.39±1.27	2.57±1.25	2.79±1.24
Aerobics	1.29±0.75	1.40±1.05	1.33±0.81	1.12±0.36	1.25±0.75	1.25±0.73	1.15±0.52
Swimming	1.62±1.10	1.94±1.08	1.63±0.95	1.25±0.73	1.34±0.78	1.31±0.77	1.16±0.62
Baseball, softball	1.23±0.66	1.63±1.30	1.22±0.66	1.04±0.24	1.08±0.42	1.08±0.42	1.24±0.73
Dance	1.09±0.47	2.10±1.23	1.98±1.32	1.50±0.82	1.37±0.87	1.40±0.87	1.41±0.90
Football	1.36±0.84	3.08±1.62	1.00±0.00	1.43±0.88	1.00±0.00	2.08±1.30	1.09±0.49
Badminton	2.15±1.47	1.44±0.99	1.38±0.80	1.21±0.64	1.06±0.38	1.26±0.69	1.24±0.55
Skateboarding	1.42±0.88	1.19±0.67	1.38±0.88	1.11±0.51	1.16±0.60	1.18±0.60	1.15±0.45
Soccer	1.19±0.58	2.25±1.73	2.20±1.43	1.02±0.20	1.96±1.28	1.38±0.92	2.15±1.36
Street hockey	1.91±1.20	1.00±0.00	1.10±0.45	1.04±0.31	1.02±0.17	1.06±0.39	1.04±0.28
Volleyball	1.08±0.45	1.27±0.84	2.04±1.22	1.76±0.91	1.45±0.93	2.06±1.18	1.72±0.99
Floor hockey	1.46±0.87	1.15±0.36	1.12±0.45	1.04±0.24	1.02±0.22	1.08±0.43	1.19±0.55
Basketball	1.23±0.68	2.17±1.29	2.09±1.10	1.28±0.59	1.51±0.96	1.98±1.18	1.94±1.12
Ice skating	1.34±0.82	1.19±0.67	1.22±0.67	1.07±0.45	1.06±0.38	1.11±0.51	1.07±0.36
Cross-country skiing	1.76±1.11	1.02±0.14	1.21±0.73	1.04±0.20	1.02±0.21	1.11±0.53	1.03±0.22
Ice hockey/ringette	1.28±0.81	1.00±0.00	1.05±0.32	1.05±0.30	1.02±0.20	1.07±0.40	1.04±0.32
Other (option 1)	1.63±1.14	1.83±1.39	2.69±1.51	1.00±0.00	1.89±1.20	1.97±1.30	1.00±0.00
Other (option 2)	1.42±1.01	1.69±1.29	1.00±0.00	1.00±0.00	1.44±0.99	1.00±0.00	1.00±0.00
<b>PAQ-A-Q2: PA at PE classes</b>	3.86±0.97	4.19±0.82	4.26±0.93	3.69±1.14	4.11±0.82	4.33±0.9	4.12±0.89
<b>PAQ-A-Q3: PA at recess</b>	2.43±1.23	3.98±1.16	2.88±1.35	2.27±1.30	2.38±1.06	2.50±1.23	2.20±1.27
<b>PAQ-A-Q4: PA at lunch time</b>	1.72±1.13	3.75±1.31	2.57±1.31	1.95±1.13	1.59±1.03	1.92±1.17	1.74±1.03
<b>PAQ-A-Q5: PA at early afternoons</b>	2.78±1.31	3.25±1.33	3.36±1.22	2.8±1.40	2.7±1.130	3.13±1.32	3.05±1.33
<b>PAQ-A-Q6: PA at evenings</b>	2.92±1.23	3.29±1.18	2.84±1.24	2.71±1.4	2.59±1.09	3.04±1.30	2.68±1.29
<b>PAQ-A-Q7: PA at last weekend</b>	2.68±1.11	2.98±1.31	3.07±1.14	2.75±1.24	2.43±0.99	3.01±1.23	2.54±1.19
<b>PAQ-A-Q8: general PA at last week</b>	2.80±1.18	3.02±1.42	2.96±1.22	2.6±1.20	2.72±1.05	3.14±1.23	2.85±1.15
<b>PAQ-A-Q9: PA level last week by day</b>							
Monday	3.05±1.32	3.25±1.25	3.16±1.28	2.76±1.34	2.64±1.48	3.24±1.33	3.28±1.28
Tuesday	3.15±1.28	3.33±1.37	3.30±1.21	2.72±1.36	2.64±1.41	3.17±1.30	3.27±1.20
Wednesday	3.15±1.30	3.04±1.27	3.25±1.23	2.68±1.33	2.71±1.47	3.31±1.31	3.28±1.22
Thursday	3.17±1.27	3.38±1.35	3.35±1.23	2.71±1.28	2.74±1.45	3.22±1.32	3.33±1.25
Friday	3.33±1.30	3.46±1.17	3.35±1.28	2.88±1.39	2.81±1.46	3.43±1.33	3.30±1.21
Saturday	3.17±1.44	3.42±1.37	3.13±1.35	2.61±1.42	2.78±1.44	3.40±1.35	2.94±1.37
Sunday	2.40±1.32	2.85±1.41	2.83±1.32	2.37±1.35	2.34±1.34	3.14±1.41	2.61±1.31

Values are mean and standard deviation. All questions in the PAQ-A questionnaire are registered with a categorical scale ranged from 1 to 5.

Differences between countries for each variable were estimated by ANOVA (all p<0.05).

Abbreviations: PAs=Physical Activities; PAQ-A=Physical Activity Questionnaire for Adolescents. Q=Question.



Table 10 shows the mean values (SD) of each item comprising the PAQ-C/A questionnaire for each country. Significant differences were found in the total score of the PAQ-C/A among the different countries. The highest mean score was achieved by students from the UK (3.28±0.81), Poland (2.99±0.71), and Serbia (2.87±0.70), followed by Spain (2.65±0.71) and Hungary (2.65±0.70). The lowest mean scores were obtained by participants from Bulgaria (2.53±0.71) and Italy (2.51±0.58) (Figure 12).

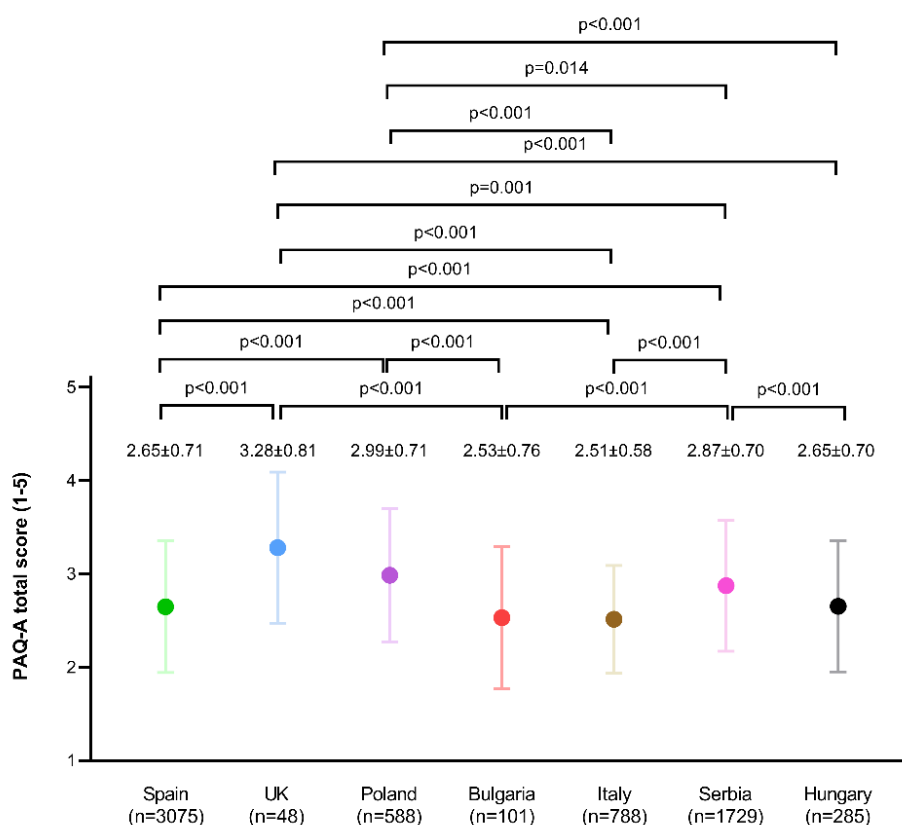


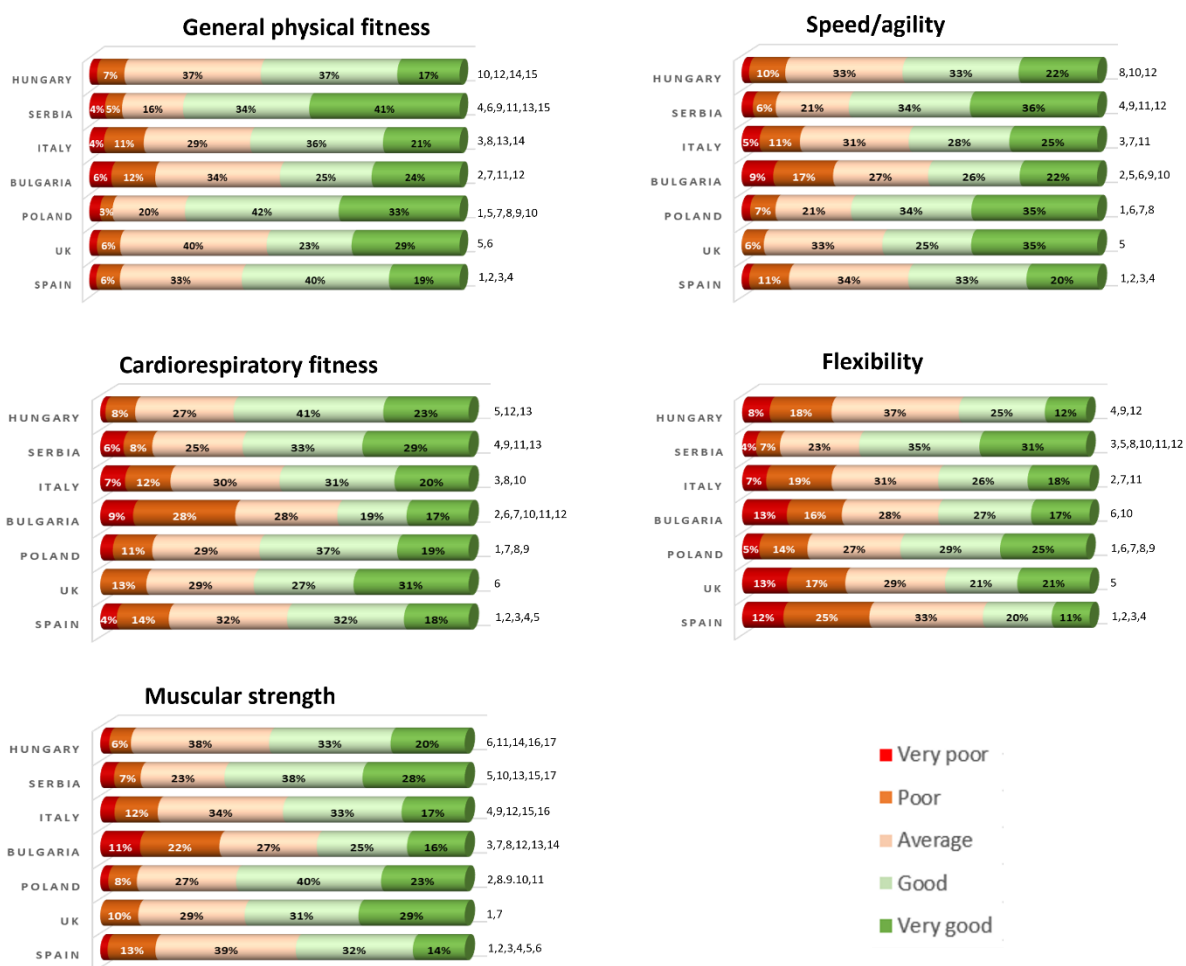
Figure 12. PAQ-C/A total score segmented by country. The circular symbols represent the mean, and the lines the standard deviation in each group. p-values for pairwise differences (ANOVA with Bonferroni post hoc analyses) by country are shown.

#### IV.2. Self-reported physical fitness by country

Many differences were also found in the self-reported level of physical fitness among students from different countries. For instance, 75% of participants from Serbia and Poland reported having a general physical fitness level of good or very good. This percentage was 59% in Spain, 57% in Italy, and 54% in Hungary, while the lowest percentages of adolescents reporting a good or very good level of general physical fitness were found in the UK (52%) and Bulgaria (49%). In Bulgaria, 36.6% of participants declared having a poor or very poor level of cardiorespiratory fitness; in the rest of the



countries, this percentage did not exceed 20%. The percentage of participants reporting high or very high levels of muscular strength ranged from 40.59% in Bulgaria to 65.93% in Serbia. The highest percentage of participants declaring a low or very low level of speed/agility was found in Bulgaria (25.74%), and the lowest was in the UK (6.25%). Finally, a high percentage of participants from Serbia (66.5%) reported having a high or very high level of flexibility, while only 31.06% of participants from Spain reported high or very high levels in this physical capacity (Figure 13).



**Figure 13. Self-reported physical fitness level by country.** Significant differences in percentage distribution were found for all physical fitness variables (Pearson Chi squared test; all  $p < 0.05$ ). Pairwise comparison between countries were performed calculating adjusted residuals to determine where the largest differences between observed and expected counts arose. Among those countries that contain an equal numerical index in each graph, there are differences in the distribution of responses ( $p < 0.05$ ). For example, significant differences in general cardiorespiratory fitness responses were found between Spain/Poland (1), Spain/Bulgaria (2), Spain/Italy (3), Spain/Serbia (4), Spain/Bulgaria (5), UK/Bulgaria (6), Poland/Bulgaria (7), Poland/Italy (8), Poland/Serbia (9), Bulgaria/Italy (10), Bulgaria/Serbia (11), Bulgaria/Hungary (12), and Serbia/Hungary (13).



### IV.3. Other health-related behaviours (screen time, sleep time, and diet) by country

Again, we identified significant differences in students' screen time across countries (Table 11). The average screen time (SD) for participants during weekdays ranged from 3.23 (2.46) h/day in Italy to 5.66 (4.15) h/day in Hungary. Meanwhile, the average screen time (SD) for students varied from 4.81 (3.18) h/day in Italy to 8.46 (5.52) h/day in the UK. Participants in Poland spent the lowest time watching TV on weekdays (1.19±1.20 h/day) or weekends (1.79±1.47 h/day). In contrast, students in the UK spent the highest time watching TV (1.77±1.99 h/day on weekdays, and 3.27±2.08 h/day on weekends) and playing videogames (1.77±1.99 on weekdays and 2.73±2.36 h/day on weekends). Participants from Spain and Italy showed the lowest time spent playing videogames on weekdays (0.64±1.28 h/day) and weekends (1.17±1.87 h/day), respectively. Bulgarian participants spent the highest time using social networks on weekdays (3.25±2.32 h/day) and weekends (3.35±2.37 h/day). On the other hand, the lowest time spent browsing social networks on weekdays (1.22±1.36 h/day) or weekends (1.61±1.61 h/day) was observed among Italian participants.

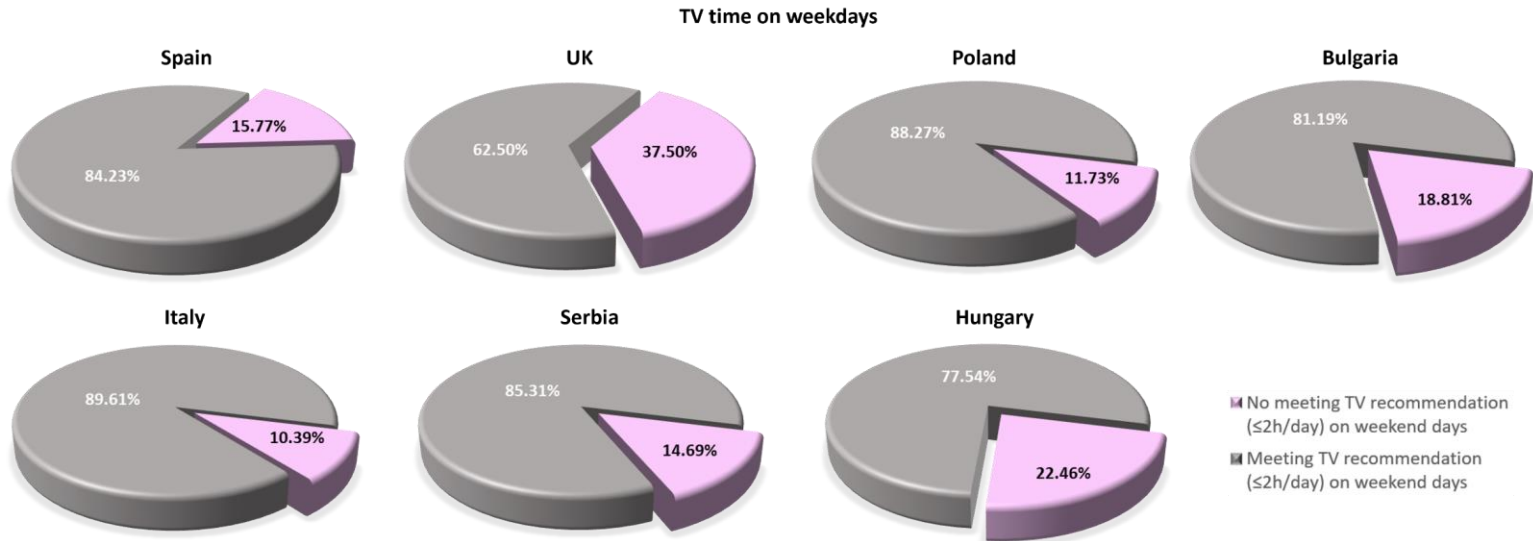
**Table 11. Screen time of participants by country.**

	Spain	UK	Poland	Bulgaria	Italy	Serbia	Hungary	P1
Total screen time* on weekdays (h/day)	4.07±3.49	5.97±4.8	3.55±2.93	5.78±4.16	3.23±2.46	4.11±3.56	5.66±4.15	<0.001 1-2, 1-3, 1-4, 1-5, 1-7, 2-3, 2-5, 2-6, 3-4, 3-6, 2-7, 4-5, 4-6, 5-6, 5-7, 6-7
Watching TV (h/day)	1.38±1.47	2.31±1.85	1.19±1.20	1.51±1.59	1.26±1.05	1.38±1.31	1.55±1.58	<0.001 1-2, 2-3, 2-4, 2-5, 2-6, 2-7, 3-7, 5-7
Playing videogames (h/day)	0.64±1.28	1.77±1.99	0.94±1.27	1.03±1.77	0.75±1.01	1.07±1.45	1.47±1.88	<0.001 1-2, 1-3, 1-6, 1-7, 2-3, 2-4, 2-5, 2-6, 3-7, 5-6, 5-7, 6-7
Using social networks (h/day)	2.05±1.91	1.89±1.94	1.41±1.43	3.25±2.32	1.22±1.36	1.67±1.78	2.64±2.10	<0.001 1-3, 1-4, 1-5, 1-6, 1-7, 2-4, 3-4, 3-7, 4-5, 4-6, 5-6, 5-7, 6-7
Total screen time* on weekend days (h/day)	6.91±4.34	8.46±5.52	5.01±3.55	6.35±4.36	4.81±3.18	5.35±4.03	7.96±5.19	<0.001 1-3, 1-5, 1-6, 1-7, 2-3, 2-5, 2-6, 3-7, 4-5, 4-7, 5-6, 5-7, 6-7
Watching TV (h/day)	2.30±1.84	3.27±2.08	1.79±1.47	1.83±1.90	1.95±1.39	2.06±1.75	2.32±1.98	<0.001 1-2, 1-3, 1-5, 1-6, 2-3, 2-4, 2-5, 2-6, 2-7, 3-6, 3-7, 5-7
Playing videogames (h/day)	1.73±2.03	2.73±2.36	1.43±1.60	1.17±1.87	1.25±1.44	1.41±1.68	2.53±2.50	<0.001 1-2, 1-3, 1-5, 1-6, 1-7, 2-3, 2-4, 2-5, 2-6, 3-7, 4-7, 5-7, 6-7
Using social networks (h/day)	2.88±2.12	2.46±2.18	1.79±1.68	3.35±2.37	1.61±1.61	1.88±1.95	3.10±2.34	<0.001 1-3, 1-5, 1-6, 3-4, 3-7, 4-5, 4-6, 5-6, 5-7, 6-7

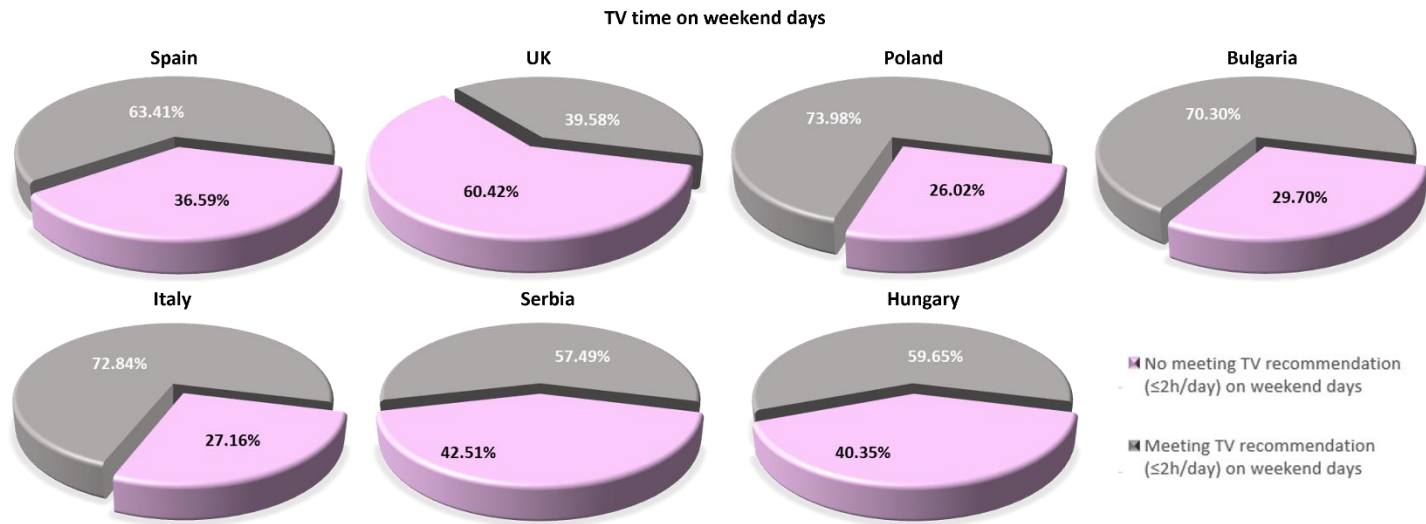
Values are mean and standard deviation. \*Total screen time was estimated as the sum of time spending watching TV, playing videogames and using social networks.

P1: p-value for differences between countries were estimated by ANOVA with post-hoc analysis (Bonferroni). P values for ANOVA and significant (p<0.05) pairwise differences are specified in the last column (i.e., 1-2 means that there are differences between Spain and UK).

Abbreviations: TV=Television.

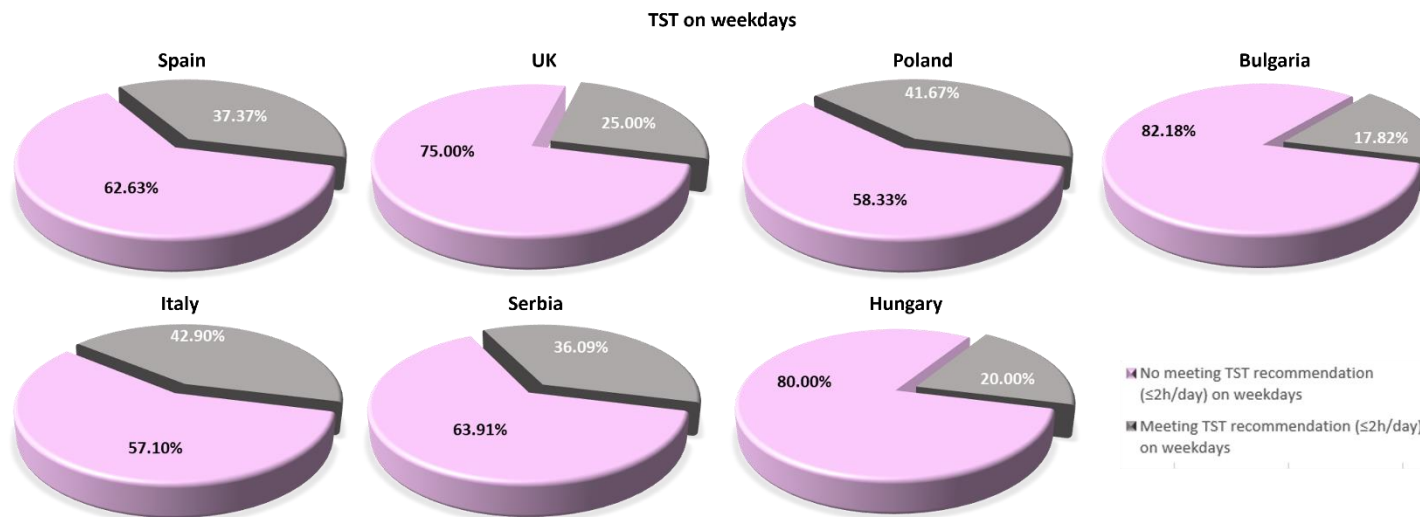


**Figure 14.** Compliance with TV time recommendation (≤2h/day) on weekdays by country. Abbreviations: TV=Television.



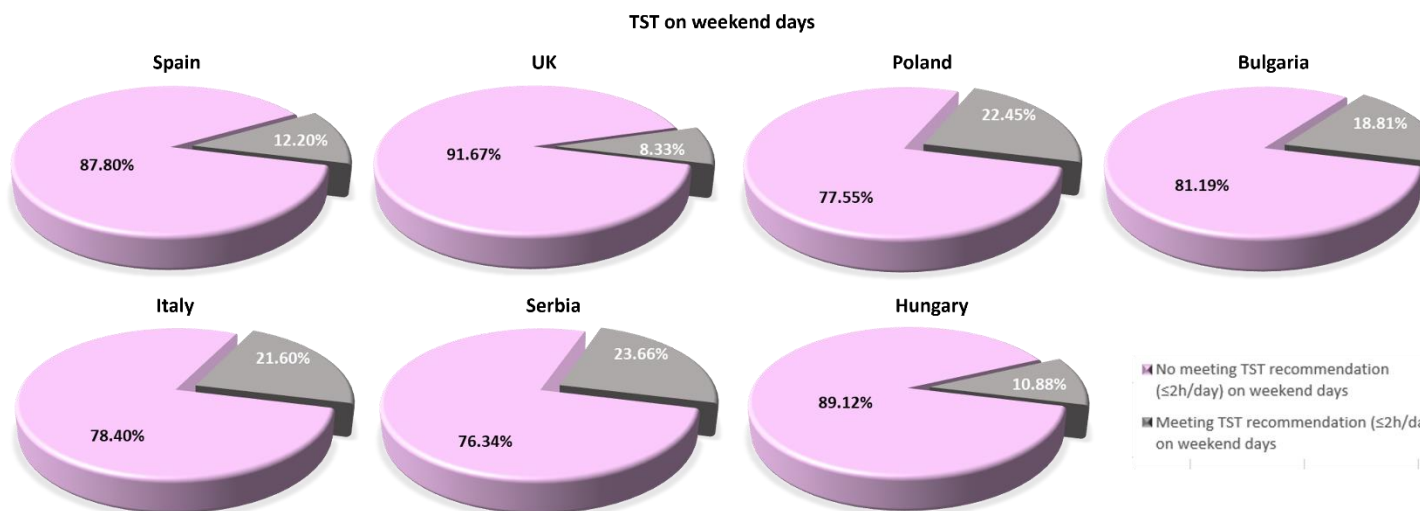
**Figure 15.** Compliance with TV time recommendation (≤2h/day) on weekend days by country. Abbreviations: TV=Television.





**Figure 16. Compliance with TST time recommendation ( $\leq 2\text{h/day}$ ) on weekdays by country.**

Abbreviations: TST=Total Screen Time (calculated as the sum of time watching TV, playing videogames and using social networks); TV=Television.



**Figure 17. Compliance with TST time recommendation ( $\leq 2\text{h/day}$ ) on weekend days by country.**

Abbreviations: TST=Total Screen Time (calculated as the sum of time watching TV, playing videogames and using social networks); TV=Television.



Thus, the percentage of participants who do not meet the recommendation of watching 2 hours or less of TV per day was 15.77% in Spain, 37.50% in the UK, 11.73% in Poland, 18.81% in Bulgaria, 10.39% in Italy, 14.69% in Serbia, and 22.46% in Hungary on weekdays (Figure 14). The corresponding percentages for weekends were 6.59% in Spain, 60.42% in the UK, 26.02% in Poland, 29.70% in Bulgaria, 27.16% in Italy, 42.51% in Serbia, and 40.35% in Hungary (Figure 15). In all countries, more than half of the students do not comply with the recommendation to limit total screen time to two hours per day on weekdays (Figure 16), and over 75% of participants in all countries did not meet this recommendation on weekends (Figure 17).

The average sleep time (SD) on weekdays ranged from 7.36 (1.35) h/day in Hungary to 9.72 (2.27) h/day in the UK. On weekends, the mean (SD) sleep time ranged from 8.90 (1.78) in Hungary to 9.46 (1.46) h/day in Serbia (Table 12). Thus, the percentage of participants who do not meet sleep time recommendations by age was 29.84% in Spain, 64.58% in the UK, 32.08% in Poland, 29.90% in Bulgaria, 23.20% in Italy, 25.28% in Serbia, and 31.67% in Hungary (Figure 18). Additionally, 45.77% of participants in Spain, 57.45% in the UK, 57.66% in Poland, 69.39% in Bulgaria, 51.61% in Italy, 48.25% in Serbia, and 61.57% in Hungary do not meet sleep time recommendations on weekends (Figure 19).

**Table 12. Sleep time of participants by country.**

	Spain	United Kingdom	Poland	Bulgaria	Italy	Serbia	Hungary	P1
Usual sleep time on weekdays (h/day)	7.92±1.33	9.72±2.27	8.08±1.38	7.35±1.34	8.28±1.09	8.29±1.25	7.36±1.35	<0.001 1-2,1-4, 1-5, 1-6, 1-7, 2-3, 2-4, 2-5, 2-6, 2-7, 3-4, 3-6, 3-7, 4-5, 4-6, 5-6, 6-7
Usual sleep time on weekend days (h/day)	9.44±1.73	9.19±2.55	9.19±1.79	9.20±1.70	9.31±1.42	9.46±1.46	8.90±1.78	<0.001 1-3, 1-7, 3-6, 5-7, 6-7

Values are mean and standard deviation. are mean and standard deviation.

P1: p-value for differences between countries were estimated by ANOVA with post-hoc analysis (Bonferroni). P values for ANOVA and significant (p<0.05) pairwise differences are specified in the last column (i.e., 1-2 means that there are differences between Spain and UK).

In Table 13, the responses to each item of the KIDMED questionnaire on Mediterranean diet quality are shown for each country. The highest total score on the KIDMED questionnaire was obtained by participants in Poland (6.18±2.59), while the lowest was found among participants in Hungary (4.14±2.90). The mean (SD) score on the KIDMED questionnaire was 5.68 (2.23) for participants in Spain, 5.94 (3.36) in the UK, 5.55 (3.00) in Bulgaria, 5.29 (2.49) in Italy, and 5.88 (2.50) in Serbia (Figure 20). Thus, the percentage of participants whose diet was classified as low (score ≤ 3 points), medium (score ranging from 4 to 7 points), or high quality (score ≥ 8 points) according to the KIDMED questionnaire varied significantly among countries. Around 34% of participants in Poland, 31% in the UK, 30% in Bulgaria, 28% in Serbia, 23% in Spain, 20% in Italy, and 13% in Hungary reported a high quality of the Mediterranean diet (Figure 21). The highest percentage of participants with a low-quality diet was found in Hungary (40%), followed by Italy and Bulgaria (24%), and the UK (21%); the lowest percentages of low-quality diet were observed among participants in Serbia (18%), Spain (17%), and Poland (14%).



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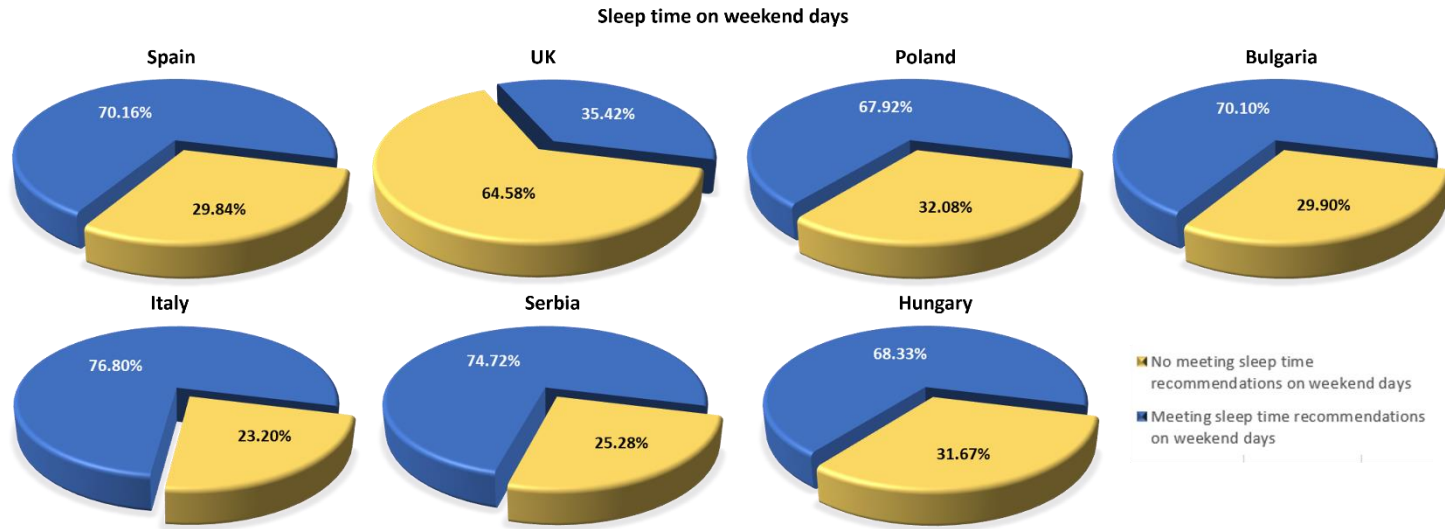


Figure 18. Compliance with sleep time recommendation on weekdays by country.

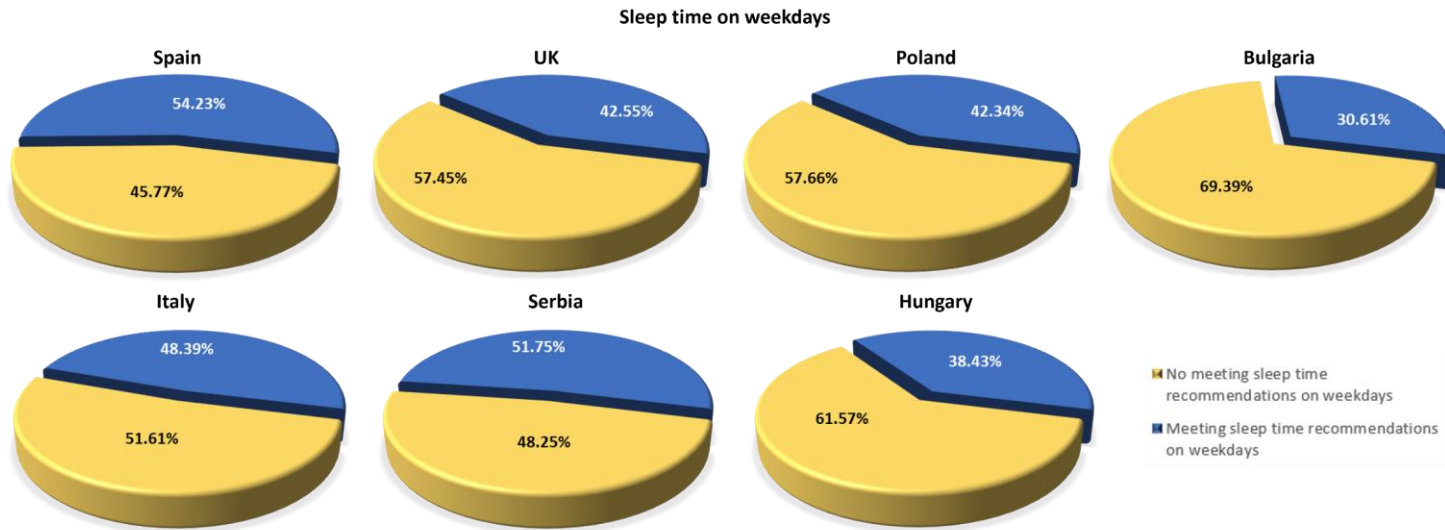


Figure 19. Compliance with sleep time recommendation on weekend days by country.





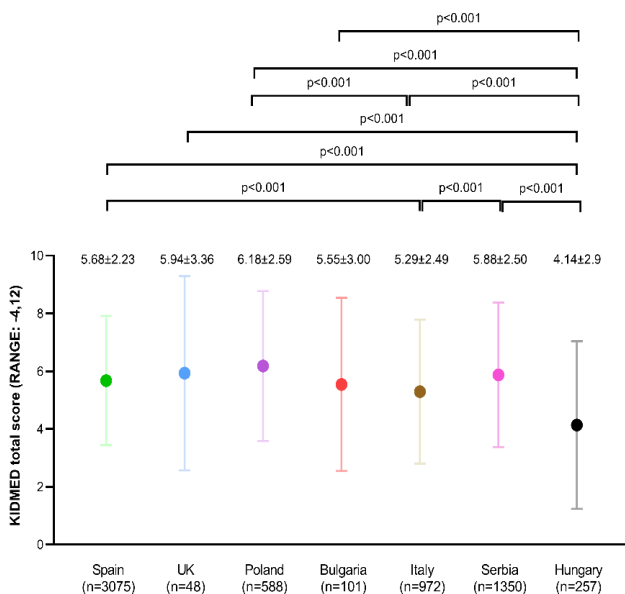
**Table 13. KIDMED questionnaire (responses by question) by country**

	Spain	United Kingdom	Poland	Bulgaria	Italy	Serbia	Hungary
Do you eat a piece of fruit or drink fresh fruit juice every day?	2351 (43.33)	44 (47.83)	507 (46.30)	72 (41.62)	692 (41.59)	1357 (44.49)	174 (37.99)
Do you eat a second piece of fruit every day?	1453 (32.09)	33 (40.74)	335 (36.29)	47 (31.76)	373 (27.73)	1074 (38.93)	76 (21.23)
Do you eat fresh vegetables (example: salads) or cooked vegetables (example: soup) regularly, one a day?	2262 (42.38)	34 (41.46)	479 (44.89)	89 (46.84)	614 (38.71)	1410 (45.40)	180 (38.88)
Do you eat fresh or cooked vegetables more than once a day?	1318 (30.00)	26 (35.14)	355 (37.65)	54 (34.84)	357 (26.86)	799 (32.14)	94 (25.13)
Do you eat fish/seafood (e.g., hake, sardines, octopus, shrimp) at least 2 to 3 times a week?	1893 (38.10)	24 (33.33)	213 (26.59)	48 (32.21)	449 (31.6)	617 (26.87)	58 (17.31)
Do you go, once or more a week, to fast-food restaurants like hamburger places?	767 (19.96)	27 (36.00)	139 (19.12)	36 (26.28)	206 (17.49)	533 (24.01)	66 (18.97)
Do you like and eat pulses (e.g., beans, peas, chickpeas, broad beans, lentils) more than once a week?	2177 (41.45)	29 (37.66)	302 (33.93)	75 (42.61)	531 (35.33)	1284 (43.42)	145 (33.96)
Do you eat pasta or rice almost every day (5 days or more a week)?	1338 (30.32)	35 (42.17)	304 (34.08)	34 (25.19)	833 (46.15)	499 (23.03)	185 (39.53)
Do you eat nuts (e.g., walnuts, almonds, hazelnuts) regularly (at least 2-3 times a week)?	1523 (33.12)	20 (29.41)	307 (34.30)	66 (39.52)	355 (26.75)	670 (28.39)	105 (27.27)
Do you use olive oil at home?	2749 (47.20)	27 (36.00)	402 (40.61)	67 (39.88)	912 (48.41)	1041 (38.15)	169 (37.47)
Do you take breakfast every day?	2345 (43.27)	36 (42.86)	459 (43.84)	69 (40.59)	774 (44.33)	1484 (46.70)	184 (39.66)
Do you eat cereal or cereal products (e.g., oats, bread) for breakfast?	2181 (41.5)	41 (46.07)	475 (44.68)	80 (44.20)	518 (34.77)	1349 (44.60)	206 (42.39)
Do you eat dairy products (yogurt, milk, cheese) for breakfast?	1001 (24.56)	33 (40.74)	489 (45.40)	76 (42.94)	676 (41.02)	1553 (47.87)	205 (41.92)
Do you eat commercially baked goods or pastries (e.g., cookies, cakes, croissants, donuts) for breakfast?	2595 (45.77)	23 (32.39)	285 (32.65)	64 (38.79)	727 (42.79)	949 (36.40)	224 (44.27)
Do you eat 2 yogurts and/or some cheese (about 40 g) daily?	1952 (38.83)	21 (30.43)	319 (35.17)	48 (32.21)	318 (24.65)	912 (35.23)	114 (28.79)
Do you eat sweets and candies several times a day (e.g., chocolates, gums, sweets)?	643 (17.29)	20 (29.41)	298 (33.63)	64 (38.79)	351 (26.53)	983 (37.21)	159 (35.97)

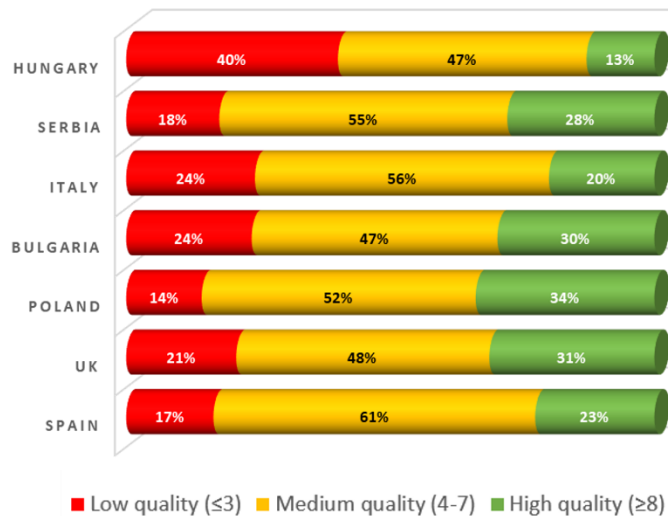
Values are frequency (n) and percentage of participants who responded affirmatively (yes) in each question of KIDMED questionnaire. All questions in the KIDMED questionnaire are binomial categorical (yes/no).



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**Figure 20.** KIDMED total score for all sample and segmented by gender (boys and girls) and age group (children and adolescents). The circular symbols represent the mean, and the lines the standard deviation in each group. p-values for differences (ANOVA with post-hoc with Bonferroni adjustment) by country are shown.



**Figure 21.** Percentage of participants with low, medium and high quality of diet (KIDMED) by country.

#### IV.4. Perceptions, interests and opinions about physical activity and other related factors.

In Table 14, the results regarding the interests and opinions of the participants about physical and sports activities, as well as the facilitating elements for the practice of physical activity provided by their schools, are shown. Overall, the highest percentages of agreement with the proposed statements were found among Serbian participants (i.e., like play sports in school [84.7%], having a gym in the school [84.9%], and perceiving that engaging in physical activity helps feel themselves in better physical condition [89.4%] and developing their personality [71.9%]). In contrast, Spain, Bulgaria, and Hungary had the lowest percentages of agreement in some of the items; for example, only 59.7% of participants in Hungary and 62.4% in Spain completely agreed that they like to practice sports in school. Additionally, fewer than 65% of participants in Spain, Bulgaria, and Hungary completely agreed that engaging in sports helps them develop their personality or that they would like to increase the hours of physical education during the school time.

#### Main results by country:

Substantial differences were found in all indicators assessed through the initial questionnaire across countries (i.e., physical activity level, screen time, sleep time, quality of diet, and attitudes and opinions of the participants). These differences need to be interpreted with caution due to the discrepancies in participant characteristics (i.e., proportion of boys and girls, age range, etc.) between countries.



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**Table 14.** Percentage of participants responded “completely agree”, “no attitude” and “completely disagree” in the questions about interest and opinions about physical activity and related factors, segmented by country

	<b>Spain</b> (agree/no attitude/ disagree, %)	<b>UK</b> (agree/no attitude/ disagree, %)	<b>Poland</b> (agree/no attitude/ disagree, %)	<b>Bulgaria</b> (agree/no attitude/ disagree, %)	<b>Italy</b> (agree/no attitude/ disagree, %)	<b>Serbia</b> (agree/no attitude/ disagree, %)	<b>Hungary</b> (agree/no attitude/ disagree, %)
Do you like play sport in school?	62.4 / 31.6 / 6.0	77.1 / 22.9 / 0.0	81.1 / 15.3 / 3.6	63.4 / 24.8 / 11.9	84.7 / 13.8 / 1.5	85.2 / 11.1 / 3.7	59.7 / 36.7 / 3.5
Does your school organize lots of sport activities?	56.7 / 36.0 / 7.3	91.7 / 8.3 / 0.0	68.5 / 25.2 / 6.3	53.5 / 33.7 / 12.9	54.8 / 34.9 / 10.3	52.0 / 31.1 / 16.3	70.0 / 26.1 / 3.2
Do you have a big gym where to play sport in school?	61.5 / 25 / 13.6	43.8 / 22.9 / 33.3	83.3 / 9.2 / 7.5	80.2 / 9.9 / 9.9	75.7 / 18.7 / 5.6	84.9 / 6.7 / 8.3	67.1 / 29.3 / 2.5
Does your school have lots of sport materials/equipment (balls, cones, racquets, nets...)	77.4 / 18.4 / 4.1	93.8 / 6.3 / 0.0	85.2 / 10.2 / 4.6	67.3 / 21.8 / 10.9	81.1 / 15.1 / 3.8	74.1 / 16.8 / 8.7	84.1 / 14.1 / 1.8
In your opinion, does your school teachers give high values to school sports?	57.4 / 35.2 / 7.3	77.1 / 18.8 / 4.2	60.0 / 33.2 / 6.8	59.4 / 29.7 / 10.9	70.6 / 24.6 / 4.8	69.3 / 22.5 / 7.3	79.2 / 18.7 / 2.1
Playing sport in and outside school time helps you to fell in better physical conditions?	79.5 / 15.7 / 4.8	81.3 / 16.7 / 2.1	79.4 / 16.0 / 4.6	74.3 / 19.8 / 5.9	84.1 / 12.9 / 3.1	89.4 / 7.7 / 2.7	73.5 / 23.0 / 3.2
Playing sport in and outside school time helps you to fell in better mental conditions?	71.8 / 21.6 / 6.6	83.3 / 12.5 / 4.2	64.3 / 26.9 / 8.8	69.3 / 22.8 / 7.9	74.0 / 22.3 / 3.7	80.6 / 14.7 / 4.5	60.1 / 32.2 / 7.8
Playing sport in and outside school time helps you in the development of your personality?	57.9 / 31.7 / 10.4	83.3 / 16.7 / 0.0	61.7 / 29.3 / 9.0	65.3 / 24.8 / 9.9	68.9 / 25.9 / 5.1	71.9 / 18.3 / 9.5	59.0 / 30.7 / 9.2
Playing sport in and outside school time helps you to socialize with people and make new friends?	69.8 / 23.0 / 7.3	81.3 / 14.6 / 4.2	62.6 / 23.3 / 14.1	61.4 / 25.7 / 12.9	80.6 / 15.6 / 3.8	79.5 / 12.5 / .07	61.5 / 30.0 / 8.1
Playing sport in and outside school time helps you to learn he basic values of fair play (such as respect rules, do not cheat, helps others?	69.1 / 24.4 / 6.5	83.3 / 16.7 / 0:0	74.1 / 19.6 / 6.3	71.3 / 19.8 / 8.9	83.8 / 13.5 / 2.7	83.1 / 10.9 / 6.0	67.5 / 25.8 / 6.0
Would you like to increase the hours of Physical Education during the school time?	61.6 / 21.6 / 16.8	77.1 / 12.5 / 10.4	65.6 / 21.1 / 13.3	64.4 / 22.8 / 12.9	82.1 / 11.9 / 6.0	74.6 / 12 / 13.1	55.1 / 30 / 13.8

Values are percentages of participants in each response category (i.e., I completely agree; I have no attitude; I completely disagree) per question.



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VII. ANNEX: MSc STUDENTS' QUESTIONNAIRE (IN ENGLISH)

# MSC Questionnaire for students (6-18 years)

## Some general questions...

- 1. What is the name of your school? (dropdown options)
- 2. What grade are you in? (drop-down options according to each country's system)
- 3. What class are you in? Indicates the exact class (e.g., 3ºA, 3-1, etc.) \_\_\_\_\_
- 4. What is your list number? Indicate the number you are assigned within your class. If you do not have an assigned number, ask your teacher to tell you the number you should indicate here \_\_\_\_\_
- 5. What is your gender?
  - (1)  Boy
  - (2)  Girl
  - (3)  Other: \_\_\_\_\_
- 6. How old are you? \_\_\_\_\_ years
- 7. Where is...
  - ... your school located?
    - (1)  In the city
    - (1)  In the countryside
  - ... your usual home located?
    - (1)  In the city
    - (1)  In the countryside

**Physical activity** is any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, school activities, playing with friends, or walking to school. Some examples of physical activity are running, brisk walking, rollerblading, biking, dancing, skateboarding, swimming, soccer, basketball, football, or surfing.

- 8. Think about the last 7 days. Did you do at least **60 minutes a day** of physical activity across the week?
  - (0) No
  - (1) Yes
- 9. Over the past 7 days, on how many days did you exercise in your free time so much that you **get out of breath or sweat**?
  - 0 days
  - 1 day
  - 2 days
  - 3 days
  - 4 days
  - 5 days
  - 6 days
  - 7 days
- 10. Over the past 7 days, on how many days did you do activities for **strengthening** muscles and bones (such as weight-lifting, sit-ups, knee-flexion, jumping, hopping, skipping, etc.)?
  - 0 days
  - 1 day
  - 2 days
  - 3 days
  - 4 days
  - 5 days
  - 6 days
  - 7 days
- 11. Over the past 7 days, on how many days did you do **stretching** exercises to lengthen or relax your muscles?
  - 0 days
  - 1 day
  - 2 days
  - 3 days
  - 4 days
  - 5 days
  - 6 days
  - 7 days



We are trying to know more about your level of **physical activity** from **the last 7 days** (in the last 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 others.

**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.

**12. Physical activity in your spare time:** Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one option per row.).

	No (1)	1-2 (2)	3-4 (3)	5-6 (4)	7 times or more (5)
Skipping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rowing/canoeing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In-line skating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tag	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walking for exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bicycling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jogging or running	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aerobics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baseball, softball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Football	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Badminton	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skateboarding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soccer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Street hockey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volleyball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floor hockey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basketball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice skating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-country skiing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice hockey/ringette	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**13. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)**

- (1)  I don't do PE
- (2)  Hardly ever
- (3)  Sometimes
- (4)  Quite often
- (5)  Always

**14. In the last 7 days, what did you do most of the time at recess? (Check one only.)**

- (1)  Sat down (talking, reading, doing schoolwork)
- (2)  Stood around or walked around
- (3)  Ran or played a little bit
- (4)  Ran around and played quite a bit
- (5)  Ran and played hard most of the time



15. In the last 7 days, what did you normally do at lunch time (besides eating lunch)? (Check one only)

- (1)  Sat down (talking, reading, doing schoolwork)
- (2)  Stood around or walked around
- (3)  Ran or played a little bit
- (4)  Ran around and played quite a bit
- (5)  Ran and played hard most of the time

16. In the last 7 days, on how many days right after school, did you do sports, dance, or play games in which you were very active? (Check one only.)

- (1)  None
- (2)  1 time last week
- (3)  2 or 3 times last week
- (4)  4 times last week
- (5)  5 times last week

17. In the last 7 days, on how many evenings did you do sports, dance, or play games in which you were very active? (Check one only.)

- (1)  None
- (2)  1 time last week
- (3)  2 or 3 times last week
- (4)  4 or 5 last week
- (5)  6 or 7 times last week

18. On the last weekend, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)

- (1)  None
- (2)  1 time
- (3)  2 - 3 times
- (4)  4 - 5 times
- (5)  6 or more times

19. Which one of the following describes you best for the last 7 days? Read all five statements before deciding on the one answer that describes you.

- (1)  A. All or most of my free time was spent doing things that involve little physical effort
- (2)  B. I sometimes (1 – 2 times last week) did physical things in my free time
- (3)  C. I often (3 – 4 times last week) did physical things in my free time
- (4)  D. I quite often (5 – 6 times last week) did physical things in my free time
- (5)  E. I very often (7 or more times last week) did physical things in my free time

20. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None (1)	Little bit (2)	Medium (3)	Often (4)	Very often (5)
Monday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wednesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thursday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saturday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sunday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

- (1)  Yes. What prevented you? \_\_\_\_\_
- (2)  No



What do you think about your current level of **physical fitness**?

22. Please, think about your current level of **physical fitness** (compared with your friends) and choose the most appropriate answer.

	(1) Very poor	(2) Poor	(3) Average	(4) Good	(5) Very Good
My <b>general physical fitness</b> is...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My <b>cardiorespiratory fitness</b> (capacity to do exercise, for instance long running) is...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My <b>muscular strength</b> is...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My <b>speed/agility</b> is...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My <b>flexibility</b> is...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Now, we are going to ask you about some **sedentary behaviors** in your **leisure time**.

23. About how many hours a day do you usually...

	None at all (1)	About half h/day (2)	About 1 h/day (3)	About 2 h/day (4)	About 3 h/day (5)	About 4 h/day (6)	About 5 h/day (7)	About 6 h/day (8)	About 7 or more hours a day (9)
...watch television (including videos and DVDs)									
on <u>weekdays</u> ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
on <u>weekend days</u> ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...play games on a computer or games console (Playstation, Xbox, GameCube, etc.)									
on <u>weekdays</u> ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
on <u>weekend days</u> ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...use a computer or other electronic device (e.g., telephone or tablet) for chatting on-line, internet, social networks (e.g., Twitter, Instagram, TikTok, etc.) or similar									
on <u>weekdays</u> ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
on <u>weekend days</u> ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Sleep time

24. About how many hours a day do you usually sleep at night...

...on weekdays? \_\_\_\_\_ hours/day

...on weekend days? \_\_\_\_\_ hours/day



What about the quality of your diet?

25. Please, answer the following questions in relation to your diet.

	Yes	No
Do you eat a piece of fruit or drink fresh fruit juice every day?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat a second piece of fruit every day?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat fresh vegetables (example: salads) or cooked vegetables (example: soup) regularly, one a day?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat fresh or cooked vegetables more than once a day?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat fish/seafood (e.g., hake, sardines, octopus, shrimp) at least 2 to 3 times a week?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you go, once or more a week, to fast-food restaurants like hamburger places?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you like and eat pulses (e.g., beans, peas, chickpeas, broad beans, lentils) more than once a week?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat pasta or rice almost every day (5 days or more a week)?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat nuts (e.g., walnuts, almonds, hazelnuts) regularly (at least 2-3 times a week)?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you use olive oil at home?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you take breakfast every day?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat cereal or cereal products (e.g., oats, bread) for breakfast?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat dairy products (yogurt, milk, cheese) for breakfast?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat commercially baked goods or pastries (e.g., cookies, cakes, croissants, donuts) for breakfast?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat 2 yogurts and/or some cheese (about 40 g) daily?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>
Do you eat sweets and candies several times a day (e.g., chocolates, gums, sweets)?	(1) <input type="checkbox"/>	(0) <input type="checkbox"/>

26. Please, select the option that best suits your interests or opinions on the following statements

	I completely agree (3)	I have no attitude (2)	I completely disagree (1)
Do you like play sport in school?	😊	😐	😞
Does your school organize lots of sport activities?	😊	😐	😞
Do you have a big gym where to play sport in school?	😊	😐	😞
Does your school have lots of sport materials/equipment (balls, cones, racquets, nets...)	😊	😐	😞
In your opinion, does your school teachers give high values to school sports?	😊	😐	😞
Playing sport in and outside school time helps you to fell in better physical conditions?	😊	😐	😞
Playing sport in and outside school time helps you to fell in better mental conditions?	😊	😐	😞
Playing sport in and outside school time helps you in the development of your personality?	😊	😐	😞
Playing sport in and outside school time helps you to socialize with people and make new friends?	😊	😐	😞
Playing sport in and outside school time helps you to learn he basic values of fair play (such as respect rules, do not cheat, helps others)?	😊	😐	😞
Would you like to increase the hours of Physical Education during the school time?	😊	😐	😞

**THANK YOU**



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