11

Students' physical activities and eating habits

Regular exercise and healthy eating are important for people of all ages, but perhaps particularly so for teenagers, as adolescence is the period when many lifelong habits are formed. This chapter examines the extent of students' physical activities in and outside of school, and how regular physical activity (or the lack of it) is related to student performance and well-being. The chapter also describes students' eating habits, including eating disorders among adolescents, and the benefits of eating meals with parents.

Students' overall physical fitness and health are important pre-requisites for high academic performance, and social and emotional well-being. People who exercise regularly are less likely to suffer from diabetes or cardiovascular diseases (Haskell et al., 2007) and are in better overall health (Penedo and Dahn, 2005) than people who do not. In many high-income countries, and in a growing number of middle- and low-income countries, a sedentary lifestyle is one of the primary contributors to obesity (Bauman et al., 2012). There is strong evidence that participating in physical activity reduces depression and anxiety disorders, and boosts self-esteem (Biddle and Asare, 2011). Regular physical activity also appears to improve memory, perseverance and self-regulation (Biddle and Asare, 2011).

What the data tell us

- About 6.6% of students across OECD countries do not engage in any kind of moderate or vigorous physical activity outside of school. The share of physically inactive students is 1.8 percentage points higher among girls than among boys.
- Countries where students do more moderate physical activity tend to perform better in PISA. Within countries, students who do not engage in any moderate physical activities or do it every day score worse in science, on average, than students who exercise between one and six days per week.
- Physically active students are less likely than those who do not participate in any kind of physical activity outside of school to skip school, feel like an outsider at school, feel very anxious about schoolwork, or be frequently bullied.
- On average across OECD countries, 26% of girls and 18% of boys reported that they had skipped breakfast before school.
- Having dinner regularly is positively associated with adolescents' satisfaction with life, particularly among girls.

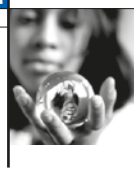
According to specialists, 14-18 year-old students should engage in some physical activity at least three days per week to strengthen their muscles and bones (Janssen and LeBlanc, 2010; Strong et al., 2005). However, analysis of data from the Health Behaviour in School-Aged Children (HBSC) survey finds that the majority of teenagers do not meet the recommended levels of physical activity, even if trends in those levels for 11-, 13- and 15-year-olds increased moderately between 2002 and 2010 (Hallal et al., 2012). Adolescents, and particularly girls, are less physically active as they grow older (Hallal et al., 2012). Since the habits established during adolescence often carry through into adulthood (Bailey, 2006), it is important to understand what influences these behaviours.

In addition to physical activity, eating habits are another important factor to consider for physical well-being. Among students (as, arguably, among all people), what, when and how one eats is closely related to physical and psychological well-being (Cooper, Bandelow and Nevill, 2011). Research shows that eating patterns can affect teenagers' quality of life in three ways. First, eating habits support (or undermine) a healthy lifestyle. Second, good eating habits are related to both physical growth and cognitive development (Birch, Savage and Ventura, 2007). Third, eating habits formed during adolescence are usually maintained through adulthood, influencing health and emotional well-being later on (Kemm, 1987; Videon and Manning, 2003).

In PISA 2015, students were asked four questions related to physical activities in and outside of school. Students reported the number of days per week they attended physical education classes at school, the number of days per week they engage in moderate physical activity outside of school for at least 60 minutes per day, or in vigorous activity outside of school for at least 20 minutes per day, and whether or not they exercise or practice sports before or after school. Physical activities, such as walking and cycling can be considered moderate if they raise a person's heart rate and the person breaks into a sweat. Activities such as hiking, jogging, or playing tennis or football are considered vigorous if breathing becomes difficult and fast, and the heart rate increases rapidly (Centers for Disease Control and Prevention, 2017).

PHYSICAL EDUCATION IN SCHOOL

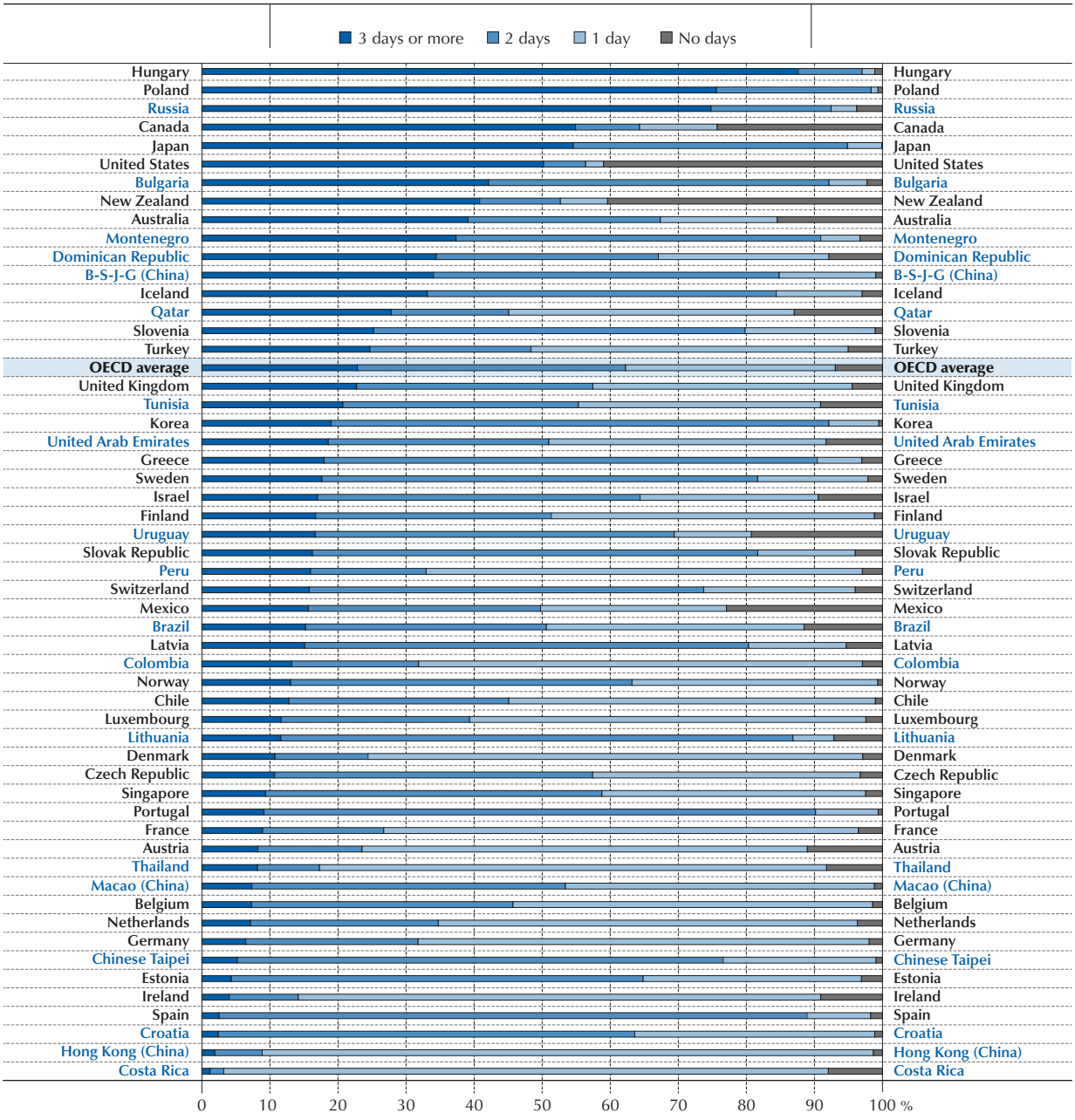
Fifteen-year-olds engage in moderate and vigorous physical activity through physical education classes at school and sports activities outside of school. Physical education aims to develop and promote students' physical competencies, a healthy lifestyle, and students' ability to apply those skills and knowledge to a range of activities (Bailey, 2006). Over the years, physical education has evolved from its original focus on teaching hygiene to teaching children the skills needed for a healthy and active lifestyle (Committee on Physical Activity and Physical Education in the School, Food and Nutrition Board, and Institute of Medicine, 2013).



In the majority of the countries and economies that participated in PISA 2015, most students take at least one physical education class per week, on average (Figure III.11.1). In Hungary, Poland, the Russian Federation (hereafter "Russia"), Canada, Japan and the United States – listed in descending order – more than one in two students reported that they take three or more physical education classes per week. In New Zealand and the United States, physical education is often an elective subject, as around 40% of students reported that they take no physical education class. Students are sometimes allowed to opt out of physical education for nonmedical reasons, often to give these students more time to learn other subjects.

Figure III.11.1 ■ **Physical education at school**

Number of days per week students reported that they attend physical education classes



Countries and economies are ranked in descending order of the percentage of students who reported that they attend physical education classes at least 3 days a week.

Source: OECD, PISA 2015 Database, Table III.11.1.

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The emphasis on physical education classes tends to decrease as students get older. On average across OECD countries, students in upper secondary school (ISCED 3) reported spending almost half a day less per week in physical education than students in lower secondary school (ISCED 2) (Table III.11.3). In Austria, Korea and Montenegro, the difference between the two groups of students is greater than one day per week. Only in Hungary, where more time is devoted to physical education than in any other PISA-participating country or economy, did students in upper secondary programmes report attending more physical education classes than students in lower secondary programmes.

Students in rural areas reported spending more hours in physical education classes than students in cities, on average, possibly because rural schools are less likely to face space constraints for physical activities. The difference in favour of rural students was particularly large in Chile, while urban students in Hungary reported taking more physical education classes than students in rural areas (Table III. 11.3).

EXERCISING OUTSIDE OF SCHOOL

Students may choose to use their time before and after school to exercise or practice sports. Figure III.11.2 shows the share of students who exercised or practiced sports on the most recent day they attended school. On average across OECD countries, 43% of students reported that they exercise or practice sports before school, and 66% reported that they exercise or practice sports after school. Overall, boys were more likely than girls to report that they exercise both before and after school. The difference in the shares of boys and girls who reported that they engage in physical activities after school is greater than 20 percentage points (in favour of boys) in Korea, Costa Rica, Turkey, Brazil, Uruguay, Tunisia, Colombia, Peru, Croatia, Chile, Macao (China) and the Dominican Republic (in descending order of that difference) (Table III.11.7b).

On average across OECD countries, 5.7% of boys and 7.5% of girls reported that they do not participate in any form of physical activity outside of school (Figure III.11.3). In Japan and the United Arab Emirates, more than 20% of girls reported doing no moderate or vigorous physical activity. In Brazil, Korea, Tunisia and the United Arab Emirates, the percentage of girls who reported doing no physical activity is at least 10 percentage points larger than the percentage of boys who reported so. Conversely, in the Czech Republic, Denmark, Finland, Norway, the Slovak Republic and Sweden, a slightly larger share of boys than girls reported that they do not do any physical activity outside of school (Figure.III.11.3).

As observed when considering physical education classes at school, students in upper secondary programmes (ISCED 3) were slightly less likely than lower secondary students to report that they participate in vigorous physical activities outside of school (Table III.11.14). In Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter "B-S-J-G [China]), Chile, Korea and Tunisia, upper secondary students reported participating in less vigorous physical activity in the previous week (by more than half a day) than students in lower secondary education.

Socio-economic status is also related to adolescents' level of physical activity. On average across OECD countries, the share of disadvantaged students who reported that they do not engage in moderate or vigorous physical activity outside of school is 4.5 percentage points larger than the share of advantaged students who reported so (Table III.11.10).

Students in the 22 countries and economies that distributed the educational career questionnaire reported the hours they participate in after-school sports instruction. The decision to take additional sports lessons may depend on students' personal preferences as well as on the availability of such lessons in the location where they live or study. But in most cases, sports lessons involve some costs. Figure III.11.4 shows the difference in the percentage of disadvantaged and advantaged students who take additional sports lessons outside of school. In nine countries and economies, advantaged students were more likely to report that they take extra sports lessons than disadvantaged students; the opposite was true in B-S-J-G (China), Peru and Thailand. On average across the 22 countries, the share of advantaged students who take additional sports lessons is about 3 percentage points larger than the share of disadvantaged students who do; and this difference is larger among girls than among boys, on average.

Under pressure to improve performance, education systems may be tempted to shift instruction time from physical education classes to subjects like reading, science or mathematics. Reductions in the time devoted to physical education may have negative long-term consequences if students do not compensate the little physical training they receive at school with some physical activities outside of school. One of the objectives of physical education is to instil a lifelong habit of physical activity. Students who learn to appreciate sports during education classes might also be more inclined to do sports outside of school (Kohl and Cook, 2013).

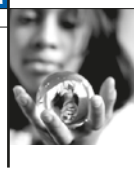
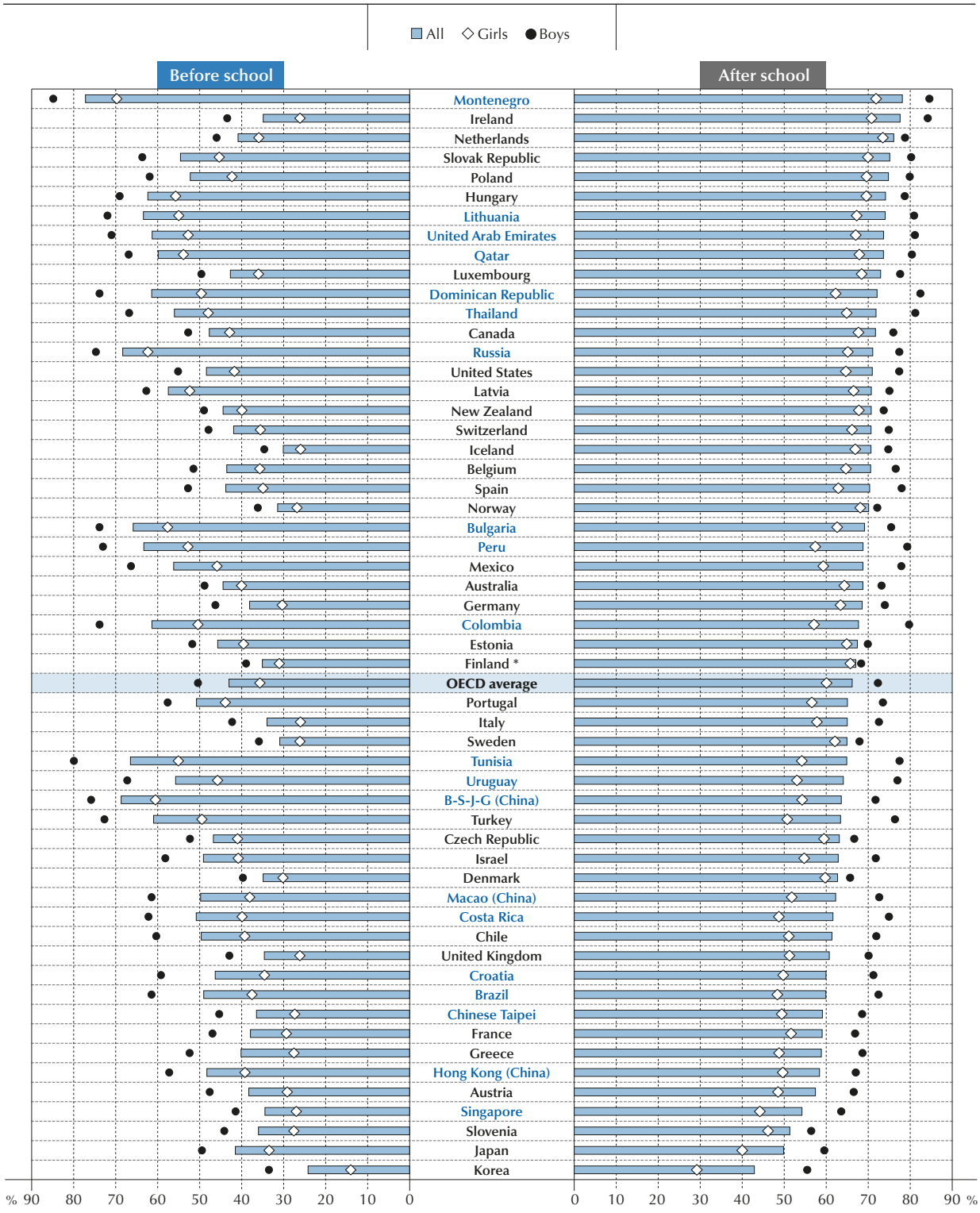


Figure III.11.2 ■ **Exercise before or after school**

Percentage of students who reported that they exercise or practice sports before or after school



Note: All gender differences for exercise before school are statistically significant. Gender differences for exercise after school that are not statistically significant are shown with an asterisk after the country/economy name (see Annex A3).

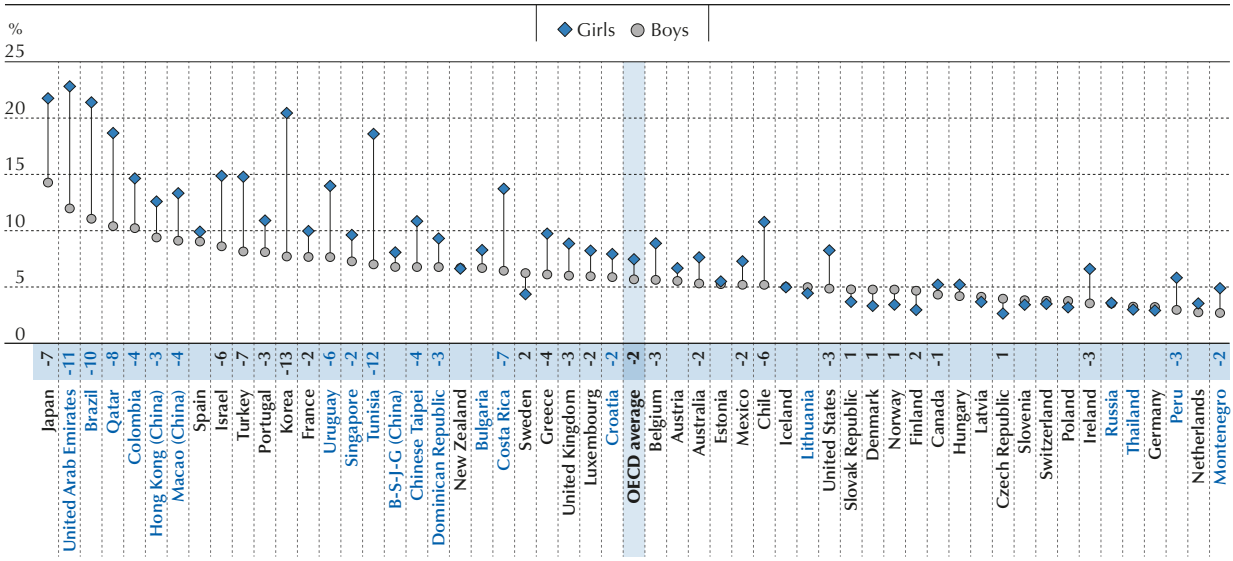
Countries and economies are ranked in descending order of the percentage of students who exercise or practice sports after school, among all students.

Source: OECD, PISA 2015 Database, Tables III.11.6, III.11.7a and III.11.7b.

StatLink http://dx.doi.org/10.1787/888933472876

Figure III.11.3 ■ **Physical activities outside of school**

Percentage of students who reported that they do not practice any vigorous or moderate physical activity outside of school



Note: Statistically significant differences between boys and girls are shown next to the country/economy name (see Annex A3).

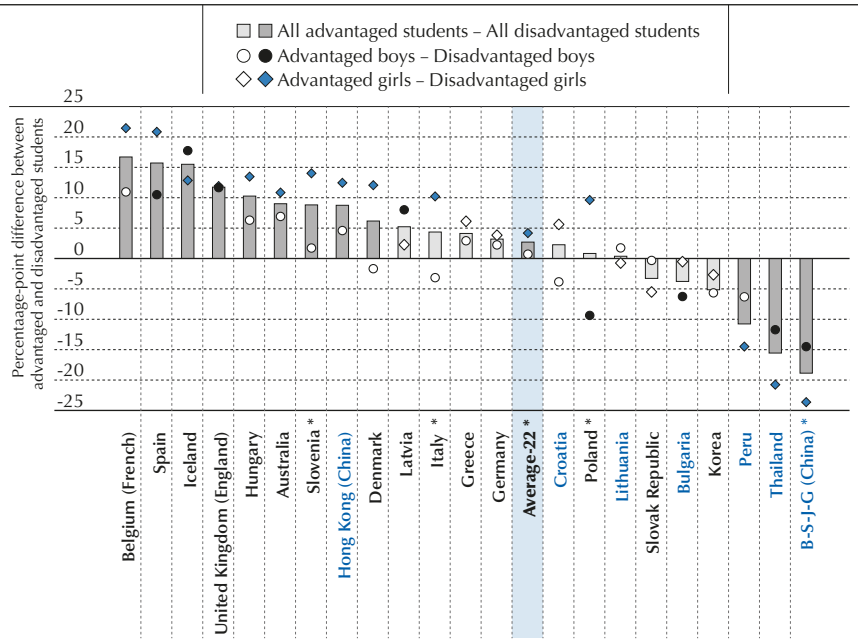
Countries and economies are ranked in descending order of the percentage of boys who reported that they do not practice any physical activity outside of school.

Source: OECD, PISA 2015 Database, Table III.11.10.

StatLink http://dx.doi.org/10.1787/888933472889

Figure III.11.4 ■ **Extra sports lessons**

Percentage-point difference between advantaged and disadvantaged students in attendance of sports lessons outside of school, by gender



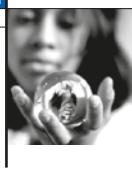
Notes: Statistically significant differences between advantaged and disadvantaged students are marked in a darker tone. Statistically significant differences in the socio-economic disparity between boys and girls are marked with an asterisk next to the country/economy name (see Annex A3).

A socio-economically advantaged (disadvantaged) student is a student in the top (bottom) quarter of the PISA index of economic, social and cultural status (ESCS) within his or her country/economy.

Countries and economies are ranked in descending order of the percentage-point difference between advantaged and disadvantaged students who take additional sports lessons, among all students.

Source: OECD, PISA 2015 Database, Table III.11.19.

StatLink http://dx.doi.org/10.1787/888933472890



Box III.11.1 **Extra lessons in music and the arts**

Some students may prefer to engage in leisure activities other than sports, such as practicing music (instruments, choir, composition), performing arts (dancing, acting) or visual arts (drawing, sculpting, photography) during their after-school hours. Engaging in leisure activities can have a positive effect on adolescents' psychological development and their satisfaction with life (Leversen et al., 2012).

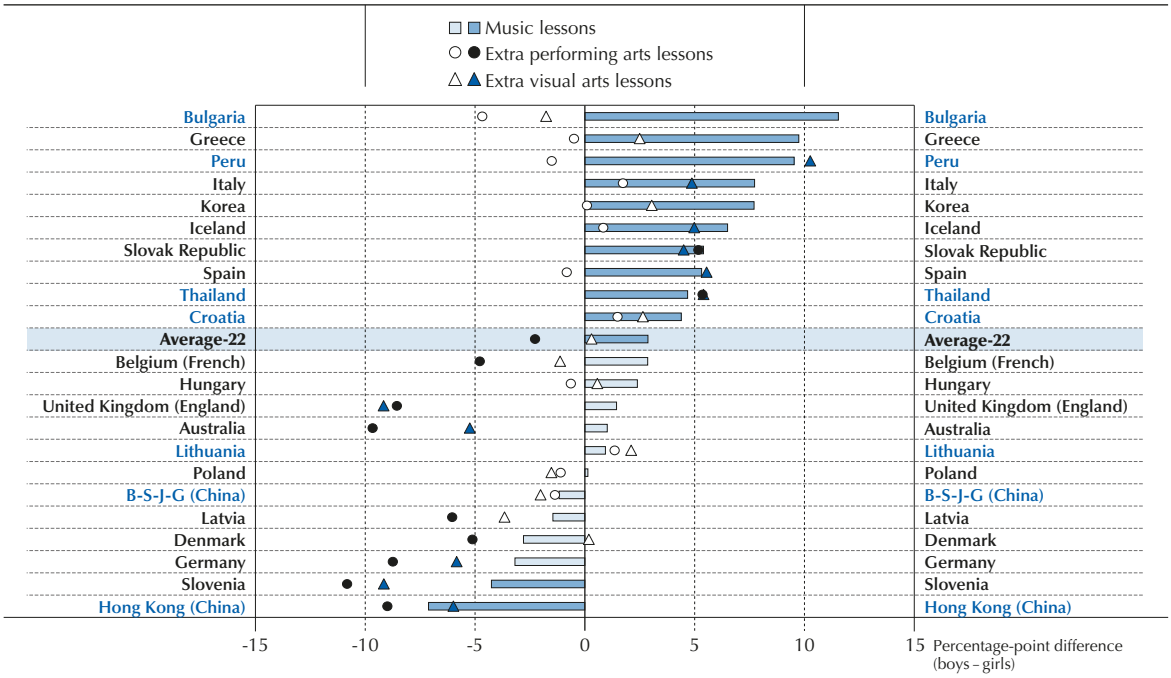
Through these lessons and activities, adolescents have an opportunity to connect with peers who have similar interests and preferences. Practicing music or instruments during childhood and adolescence is positively correlated with working memory capacity, processing speed and reasoning (Bergman, Nutley Darki and Klingberg, 2014). Engaging in musical activities can also have an impact on a person's well-being through emotion regulation (Chin and Rickard, 2014). A study in the United States found that 10th-grade students who participated in performing arts activities were less likely to be involved in risky behaviours, such as drinking alcohol, during adolescence and early adulthood (Eccles et al., 2003).

As with sports lessons, participating in these activities depends on an individual's preference, the availability of discretionary time, and financial resources. Demographic characteristics, particularly gender and socio-economic status, may affect the likelihood of taking additional lessons in arts and music outside of school. Students in the 22 countries and economies that distributed the educational career questionnaire reported the number of hours per week that they participate in performing or visual arts and/or music lessons in addition to their mandatory school classes.

On average across these 22 countries, around 38% of students take extra music lessons, 31% participate in performing arts lessons, and 33% take visual arts lessons outside of school (Table III.11.20). On average, the share of boys taking extra music lessons is 2.9 percentage points larger than the share of girls who do, whereas boys are 2.3 percentage points less likely than girls to take extra performing arts lessons (Figure III.11.5).

Figure III.11.5 ■ **Gender differences in additional music and art lessons**

Difference in the percentage of boys and girls who take additional music and art lessons



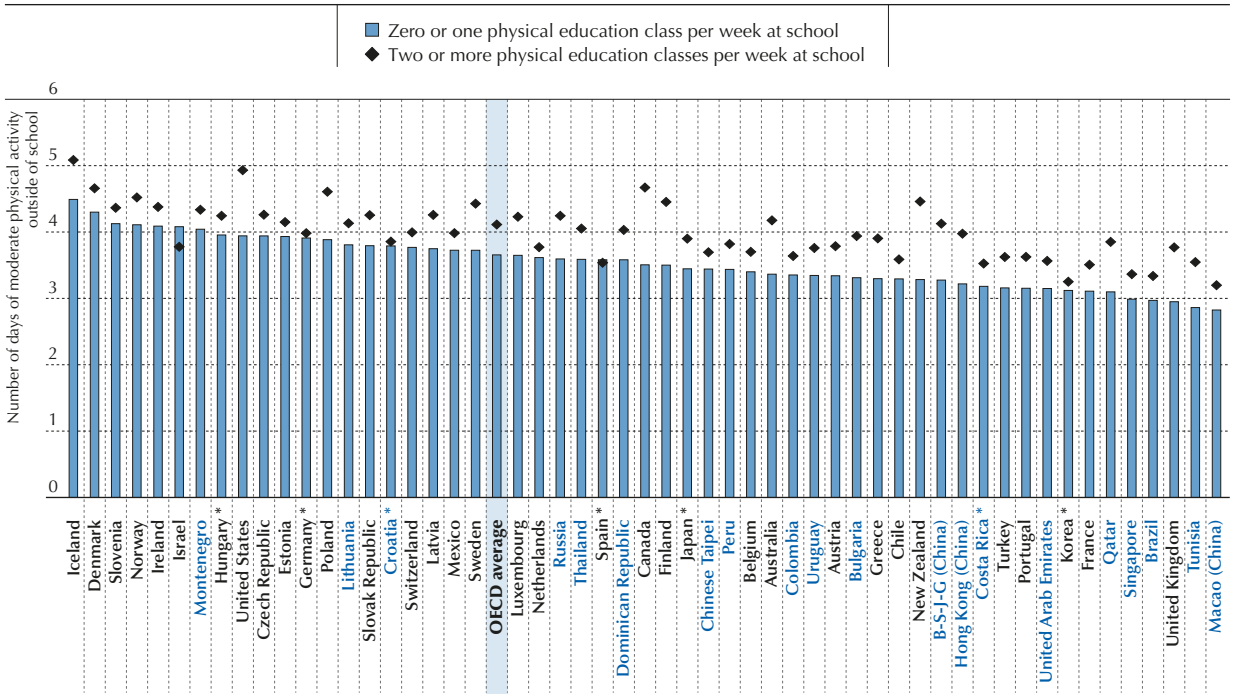
Countries and economies are ranked in descending order of the difference between the percentage of boys and girls who take extra music lessons.

Source: OECD, PISA 2015 Database, Table III.11.20.

StatLink http://dx.doi.org/10.1787/888933472906

Figure III.11.6 compares how much time per week students who participate in at least two physical education classes in school – and those who take none or only one class per week – engage in moderate or vigorous physical activity outside of school. In all but eight countries, students who take physical education classes at school are significantly more active outside of school. On average across OECD countries, students who participate in at least two physical education classes at school exercise moderately about 0.5 day per week more than students who do not take physical education classes (Table III.11.17). In Canada, Finland, New Zealand and the United States, the difference between the two groups of students in time spent engaged in moderate physical activity outside of school is equal to or greater than one day per week. This finding suggests that participating in physical activities at school might lead students to value sports more, even if it might also reflect the fact that some of the students who do not take any physical education class at school might opt out for medical reasons.

Figure III.11.6 ■ **Physical activities, in and outside of school**



Note: Differences in the number of days of moderate physical activities that are not statistically significant are marked with an asterisk next to the country/economy name (see Annex A3).

Countries and economies are ranked in descending order of the average number of days of moderate physical activity outside of school with no physical education classes in school.

Source: OECD, PISA 2015 Database, Table III.11.17.

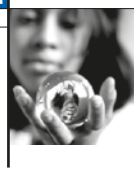
StatLink http://dx.doi.org/10.1787/888933472917

PHYSICAL ACTIVITIES AND ACADEMIC PERFORMANCE

Many studies have examined the relationship between students' physical activity and academic performance (Esteban-Cornejo et al., 2015; Busch et al., 2014; Singh et al., 2012). The evidence is mixed, as some researchers find a significant positive relationship between exercise and performance while others find no significant relationship. Research suggests that regular physical activity through sports or physical education classes can have a positive impact on students' academic performance because of its positive effects on cognitive functions (Sofi et al., 2011), executive functions (Allan, McMinn, and Daly, 2016), behaviour, concentration during classes (Singh et al., 2012), and psychological health (Busch et al., 2014).

Physical education classes and performance

On average across OECD countries, students who frequently attend physical education classes tend to have lower science scores in PISA (Table III.11.4a). This relationship is modest in the majority of countries (only 2.3% of the variation in science performance across OECD countries is explained by the number of days students attend physical education classes).

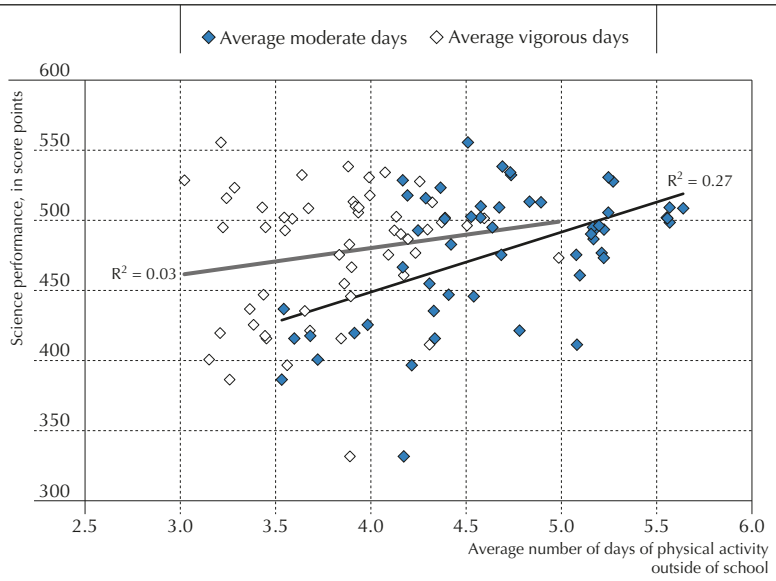


This association is unlikely to be due to any direct negative effect of exercise on academic skills, since good physical health is vital for healthy brain functions and the ability to learn (Strong et al., 2005). Research has also found that children respond faster and with greater accuracy to a variety of cognitive tasks after participating in a session of physical activity at school (Budde et al., 2008; Hillman et al., 2009; Pesce et al., 2009). A more plausible explanation is that students with poorer academic skills attend schools that provide more hours of physical education or attend optional physical education classes (Levine, Etchison, and Oppenheimer, 2014).

Exercise outside of school and performance

Figure III.11.7 shows that there is a positive relationship between the number of days students engage in moderate physical activity outside of school and the average science performance of education systems. The system-level relationship between the average number of days of vigorous physical activity outside of school and science performance is much weaker.

Figure III.11.7 ■ **Physical activity outside of school and science performance, between countries**



Source: OECD, PISA 2015 Database, Tables I.2.3 and III.11.13.
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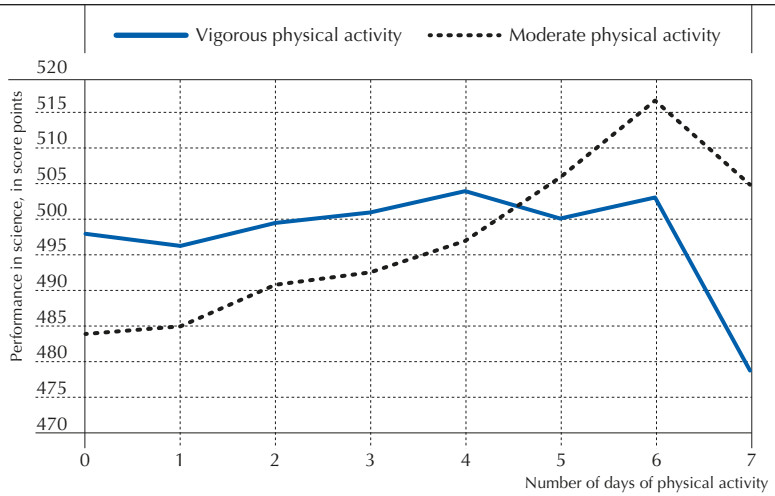
Within countries, an additional day of moderate physical activity is positively – albeit modestly – associated with students' science performance, after accounting for gender and socio-economic status; the opposite holds true for vigorous physical activity (Tables III.11.11a and III.11.12a). On average across OECD countries, an additional day of vigorous physical activity is linked to a three-point decrease in science scores, while an additional day of moderate physical activity is associated with a two-point increase, after accounting for students' gender and socio-economic status.

The difference in science scores related to an additional day of moderate physical activity, after accounting for gender and socio-economic status, is five points or greater in Belgium, Bulgaria, Montenegro, the Netherlands, Qatar, the Slovak Republic and Switzerland. In some of the top-performing countries in the PISA science assessment, such as Estonia, Hong Kong (China) and Singapore, the negative association between an additional day of vigorous physical activity and science performance is stronger than in other countries (Figure I.2.13 and Table III.11.12a).

Figure III.11.8 shows that students who engage in physical activity every day – especially vigorous physical activity – perform significantly worse than other students. On average across OECD countries, students who engage in vigorous physical activity every day score 25 points lower in science than students who exercise vigorously 4 days per week. Some of the students in the former group are a select group of "student athletes" who assign a higher priority to success in sports than to academic achievement. Student athletes may also face a higher risk of burnout and injuries due to too much training and pressure (Brenner, 2007).

Figure III.11.8 ■ **Physical activity outside of school and science performance (OECD average)**



Source: OECD, PISA 2015 Database, Table III.11.15.

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The relationship shown in Figure III.11.8 does not establish a causal relationship between physical activities and students' academic performance, and thus should not be treated as a prescription for or against the amount of physical activity an average 15-year-old student should engage in. The weak and often negative association between sports activities and performance in PISA highlights the need for further research to study the possible trade-offs between physical and cognitive performance. Students in highly competitive schools might be forced to reduce their physical activity, given the time they have to spend on homework and preparing for classes.

Asking students to reduce their physical activity to devote more time to study could backfire. A review of 50 studies finds that spending more time in school-based physical education classes and relatively less time on other school subjects does not adversely affect academic performance (Centers for Disease Control and Prevention, 2010). In addition, evidence from Shanghai suggests that low-performing students might perform worse if they replace the time spent on physical activities with extra homework or study (Zhang et al., 2015).

PHYSICAL ACTIVITIES AND NON-ACADEMIC OUTCOMES

Physical education and life satisfaction

The expected psychological and social benefits of physical education include a greater sense of self-efficacy, self-concept and self-worth (Haugen, Säfvenbom and Ommundsen, 2011), positive attitudes towards school, greater motivation and more focused goal orientation (Digelidis et al., 2003), connectedness with other students and teachers, and team building (Byrd and Ross, 1991; de la Haye et al., 2011; Macdonald-Wallis et al., 2011) . But there are significant gaps among the intent of the curriculum, the expected psychological or social benefits, and the reality of physical education programmes in many schools (HHS, 2013). These gaps are partly linked to the low status often attributed to physical education in the hierarchy of school subjects. In addition, physical education classes can be a source of anxiety and feelings of failure for unfit, uncoordinated and overweight youth.

PISA 2015 data show a weak, positive relationship between the number of physical education classes a student attends and the student's satisfaction with life (Table III.11.5). France is the only PISA-participating country where physical education and life satisfaction are negatively related.

Physical activities outside of school, life satisfaction and psychological well-being

Is the amount of time students spend engaged in physical activity linked with their satisfaction with life? Figure III.11.9 shows the difference in the average level of life satisfaction reported by students who engage in three or more days of vigorous or moderate physical activity per week and those who do not engage in any physical activity. In the majority of countries, students who exercise three or more days per week reported greater satisfaction with life than students who do not exercise outside of school. The difference in average life satisfaction is slightly larger when considering vigorous as opposed to moderate physical activity.

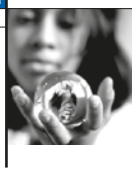
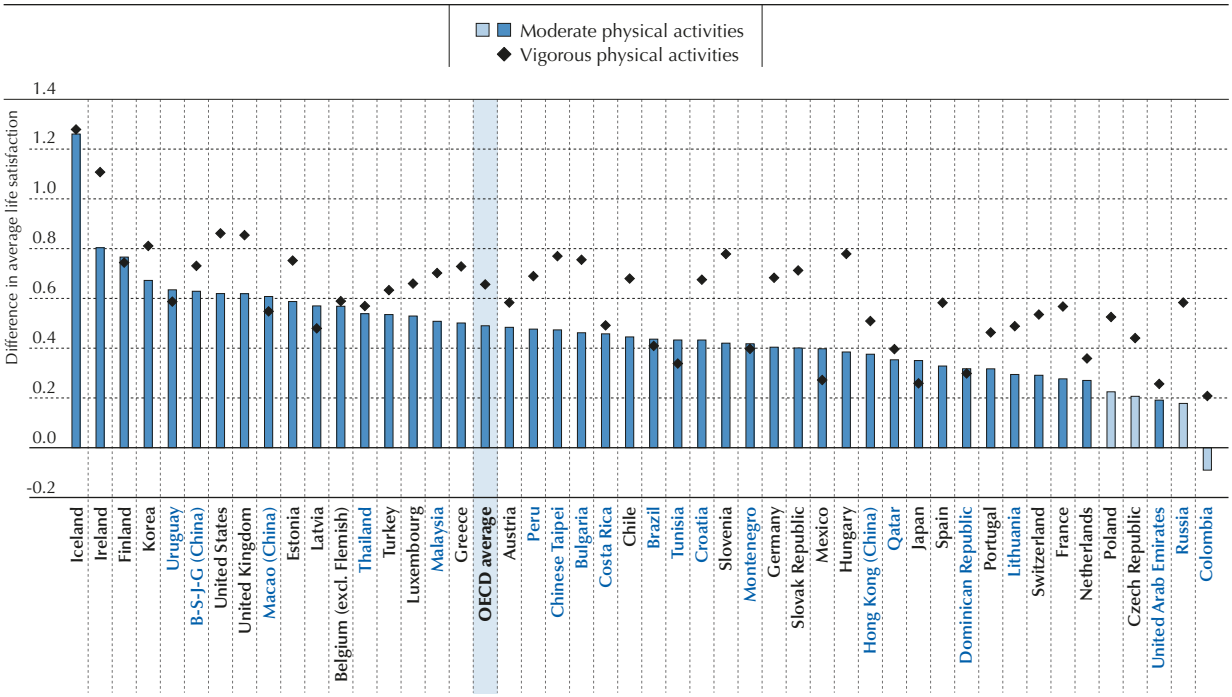


Figure III.11.9 ■ Physical activity and life satisfaction

Difference in average life satisfaction between students who engage in 3 or more days of moderate and vigorous physical activity per week and those who engage in no physical activity



Note: All differences in life satisfaction relative to engaging in vigorous physical activities are statistically significant. Statistically significant values for moderate physical activities are marked in a darker tone (see Annex A3).

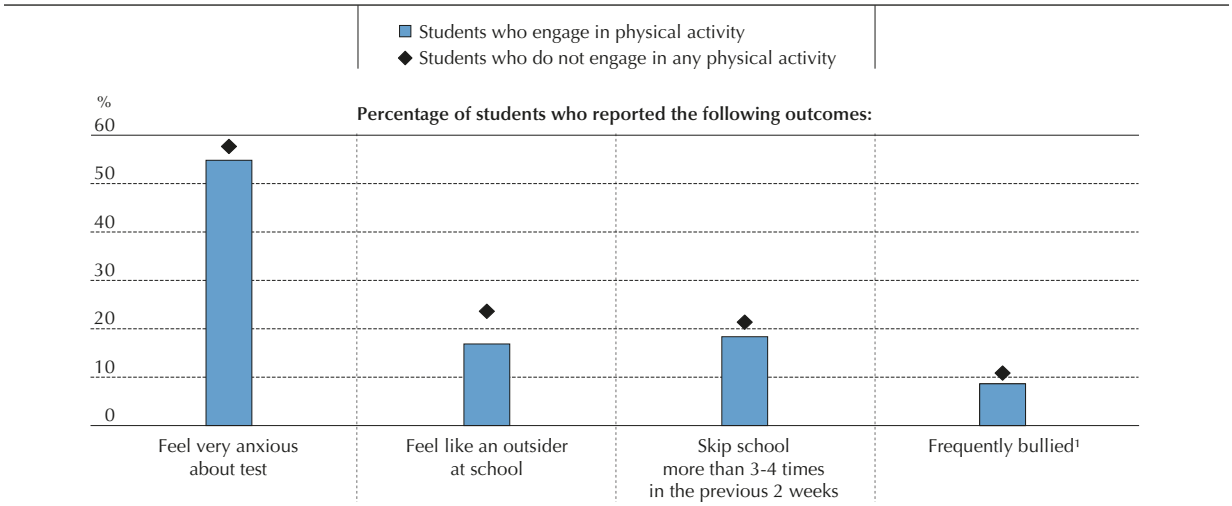
Countries and economies are ranked in descending order of the difference in average life satisfaction among all students who engage in moderate physical activities.

Source: OECD, PISA 2015 Database, Table III.11.16.

StatLink http://dx.doi.org/10.1787/888933472949

Figure III.11.10 ■ Physical activities and other outcomes

OECD average



1. A student is frequently bullied if he or she is in the top 10% of the index of exposure to bullying among all countries/economies. See Annex A1 for information on the index of exposure to bullying.

Note: All differences are statistically significant (see Annex A3).

Source: OECD, PISA 2015 Database, Table III.11.18.

StatLink http://dx.doi.org/10.1787/888933472953

On average across OECD countries, students who do not engage in any moderate physical activity reported a life satisfaction level of 6.9 on a scale from 0 to 10; students who exercise moderately at least 3 days per week reported a life satisfaction level of 7.4 on the scale (Table III.11.16). Similarly, students who exercise vigorously three days per week or more reported a satisfaction with life about 0.7 point higher than those who do not engage in any physical activity. This relationship should be interpreted with some caution because some of the students who do not report any physical activity might suffer from a physical disability.

Figure III.11.10 suggests that students who do not engage in any kind of physical activity outside of school tend to fare poorly in several psychosocial outcomes and are more likely to engage in risky behaviours. On average across OECD countries, students who reported taking part in some moderate or vigorous physical activity are 2.9 percentage points less likely to feel very anxious about schoolwork, 6.7 percentage points less likely to feel like an outsider at school, 3 percentage points less likely to skip school frequently, and 2.2 percentage points less likely to be frequently bullied than students who do not engage in any form of physical activity outside of school.

Box III.11.2 **Adolescents' physical activity and obesity**

The number of overweight or obese children and adolescents across the world has been increasing over the past few decades, particularly in developed countries (Lobstein et al., 2015). According to 2013-14 data from the Health Behaviour in School-aged Children survey, 22% of 15-year-old boys and 13% of 15-year-old girls are overweight or obese (based on students' self-reported weight and height measures), on average across 42 participating countries. In all participating countries and economies except Denmark, England, Greenland, Malta and the Netherlands, boys were more likely to be overweight or obese than girls; and in half of the countries, socio-economic status was negatively associated with the incidence of obesity. In countries where children practice more sports (defined as doing at least 60 minutes of moderate to vigorous physical activity per day), students are less likely to be overweight or obese, even if the relationship is relatively weak (a correlation of -0.18 for 15-year-old students). A stronger association is found among girls, however, with a correlation coefficient of -0.29 across 42 countries.

Source: (Quick et al., 2014).

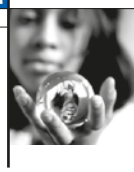
Previous research on what works to increase physical activity among adolescents does not reach a single, simple conclusion. But potentially effective strategies include high-quality physical education through improved teacher pedagogy and professional development activities (Dudley et al., 2011; Lonsdale et al., 2013). Supportive and well-trained physical education teachers can encourage students to be more active (Bailey, 2006; Borra et al., 2003). In addition, when parents believe that physical training is beneficial, their adolescent children tend to participate in physical activities (Heitzler et al., 2006). Schools could thus provide tips to parents on how to communicate the importance of exercise to their children.

STUDENTS' EATING HABITS

What affects adolescents' eating habits?

Different factors, such as health concerns, cultural habits and traditions, all influence what teenagers eat. Eating habits can also be shaped by such factors as family and peers, self-image, preferences and availability of food (Videon and Manning, 2003). Students can experience a drastic change in eating habits as they transition into adolescence. Teenagers become conscious of their own body and how it is perceived by others. Consequently, they may modify their diet in order to meet the expectations of their peers and respond to social pressure. In addition, as adolescents gain more autonomy, they, rather than their parents, decide how much time they want to spend eating, and when and what they eat (Neumark-Sztainer et al., 1999). One study using international data from the Health Behaviours in School-aged Children (HBSC) survey shows that, between 2002 and 2010, daily breakfast consumption among 11-15 year-olds increased significantly in only 6 out of the 19 countries and regions examined, while it decreased in 11 countries (Lazzeri et al., 2016).

To learn more about adolescents' eating habits, PISA 2015 asked students to report whether they ate breakfast before school or ate dinner after school on the most recent day they attended school. Figure III.11.11 indicates the share of students, by gender, who skipped breakfast or dinner. On average across OECD countries, 26% of girls and 18% of boys reported that they had skipped breakfast. In every country and economy except B-S-J-G (China), Hong Kong (China) and Japan, girls were more likely than boys to skip breakfast. The difference between the share of boys and girls who reported that they had

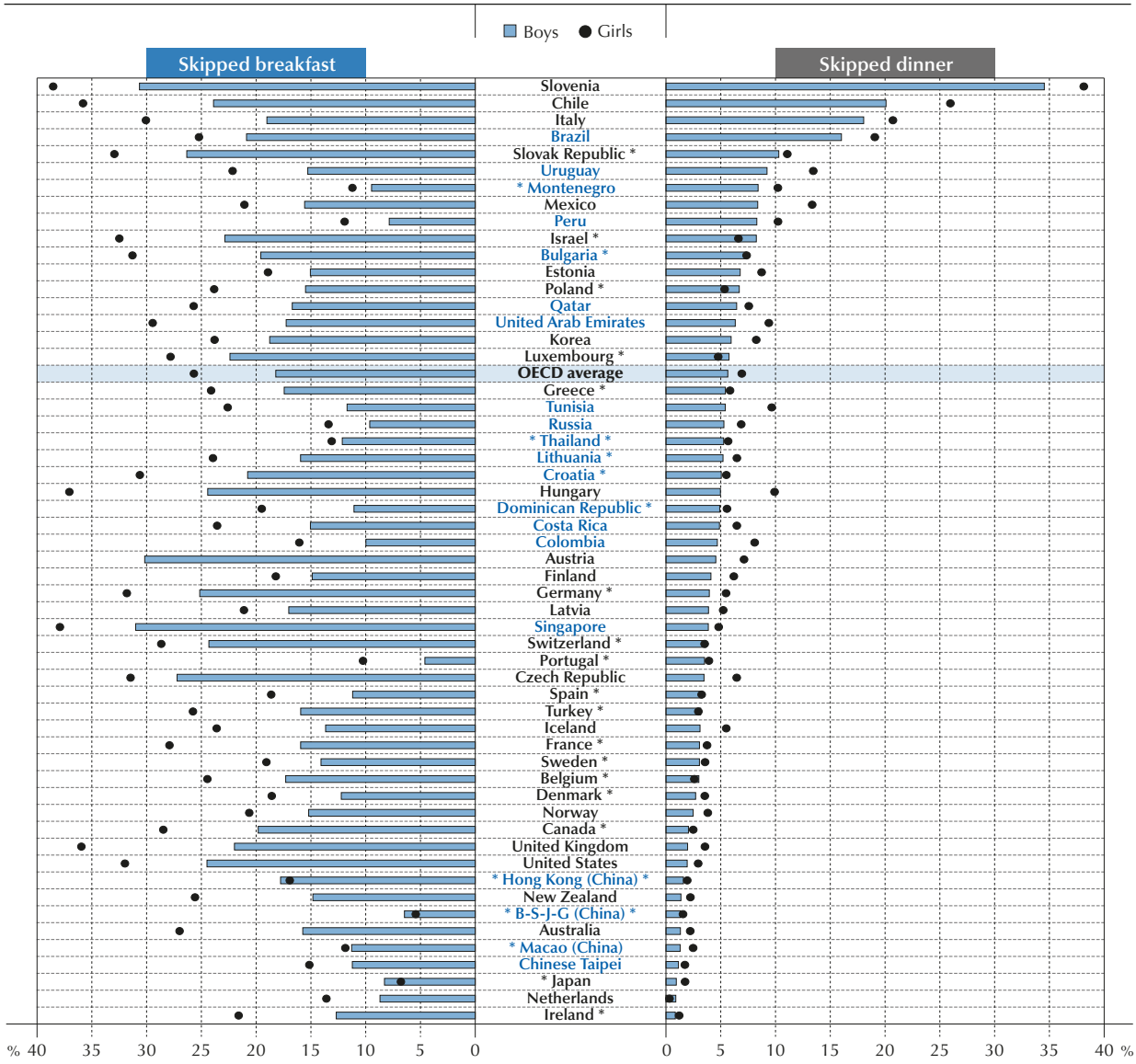


skipped breakfast ranges from 14 percentage points in the United Kingdom to 1 percentage point in Thailand. This gender difference may be partly due to the fact that girls are more likely than boys to be influenced by their perception of their own bodies (Paxton et al., 1991; Furnham, Badmin, and Sneade, 2002; McCabe and Ricciardelli, 2001; Jones, 2001). The PISA estimates represent an upper bound of the actual percentage of students skipping breakfast, as some students may choose to have breakfast when they arrive at school.

Compared to the share of students who had skipped breakfast, a considerably smaller proportion of students reported that they had skipped dinner (Table III.11.21). Still, girls were more likely to have skipped dinner than boys, but the difference between girls and boys was less pronounced than that concerning skipping breakfast (Figure III.11.11). On average across OECD countries, 7% of girls and 6% of boys reported that they had skipped dinner after school.

Figure III.11.11 ■ **Skipping meals**

Percentage of students who reported that they had skipped breakfast or dinner



Note: Differences that are not statistically significant are shown with an asterisk before (for skipping breakfast) and after (for skipping dinner) the country/economy name (see Annex A3).

Countries and economies are ranked in descending order of the percentage of boys who skipped dinner.

Source: OECD, PISA 2015 Database, Table III.11.22.

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In all countries and economies except Brazil, Chile, Italy and Slovenia, less than 15% of students reported that they had skipped dinner (Table III.11.21).

Research has shown that adolescents' eating habits are related to the quality of family relationships and to socio-economic status (Keski-Rahkonen et al., 2003). Students living in families that enjoy closeness and good communication are more likely to have eaten breakfast before school (Berge et al., 2013). Fathers' education level and employment status are also significantly associated with eating breakfast before school (Hussein, 2014). Students from socio-economically advantaged backgrounds may be more aware of the importance of eating breakfast than disadvantaged students.

On average across OECD countries, 74% of disadvantaged students reported that they had eaten breakfast before school while 82% of advantaged students reported so. In Belgium, Singapore and the United Kingdom, the difference between the share of advantaged and disadvantaged students who ate breakfast before school is greater than or equal to 15 percentage points. Similarly, a larger share of advantaged students than disadvantaged students reported that they had eaten dinner. Across OECD countries, the average difference between the two groups of students is 2.3 percentage points (Table III.11.22).

Eating habits and students' well-being

Eating breakfast can have an impact on other aspects of adolescents' lives beyond health. Students who eat breakfast might perform better in school because they are better able to concentrate and pay attention than students who skip breakfast (Adolphus, Lawton, and Dye, 2013).

Eating breakfast is positively related to students' science performance, on average across OECD countries. The association is not strong, however, as in a number of countries eating breakfast and performance are negatively related. On average across OECD countries, boys who reported that they had eaten breakfast before school score 10 points higher in science than boys who had skipped breakfast. Girls who reported that they had eaten breakfast score six points higher than those who reported that they had skipped breakfast (Figure III.11.12). After accounting for socio-economic status, eating breakfast is positively associated with science performance among boys in 27 countries and among girls in 19 countries. Girls might be more likely than boys to skip breakfast because they think they are overweight, and a self-image of being overweight is associated with poor performance, particularly among girls (Florin, Shults, and Stettler, 2011).

The family environment can also play a role in shaping adolescents' eating habits. Eating the evening meal together, as a family, can ensure that teenagers consume enough fruits and vegetables, and reduce the likelihood that adolescents will skip breakfast (Videon and Manning, 2003). Research suggests that in households where families eat dinner together, teenagers tend to enjoy better physical and emotional well-being, possibly because dinner provides time for informal discussions, and during that time, parents can promote healthy eating habits (Videon and Manning, 2003). Korean middle-school students who frequently have dinner with their families are more likely to have a balanced and nutritious meal, report higher life satisfaction, and have better emotional control than students who do not have frequent family meals (Kwon et al., 2013).

Among students in OECD countries, those who reported that they had eaten dinner reported greater satisfaction with life than those who had skipped dinner. On average, boys who had eaten dinner reported a life satisfaction of 7.6 on a scale from 0 to 10, 0.7 point higher than boys who had skipped dinner. The relationship is even stronger among girls, with a difference of one point on the scale of life satisfaction. In B-J-S-G (China), Finland, Germany, Hong Kong (China), Ireland and the United States, the average level of life satisfaction among boys who reported that they had eaten dinner with their families was at least one point higher on the scale than that among boys who reported that they had skipped dinner (Figure III.11.13). Similarly, there is a positive relationship between eating breakfast and students' life satisfaction, although the magnitude of the difference in average life satisfaction is smaller than that related to eating dinner (Table III.11.27). Overall, the relationship between eating meals (dinner or breakfast) and life satisfaction varies across countries; but in the majority of countries and economies, the relationship is stronger among girls than among boys (Table III.11.28).

Although these associations do not establish cause and effect between eating meals and adolescents' satisfaction with life (nor the existence of such a direct relationship, as other factors might be related to both life satisfaction and eating habits), they align with evidence showing eating disorders to be strongly related to low satisfaction with life among adolescents (Matthews et al., 2012). Given that girls are more likely to suffer eating disorders and to be sensitive to body image, it may be beneficial to target policies that support a positive body image and that promote regular meals at girls and young women in particular (Box III.11.3). Schools can play an important role in both targeted and universal interventions to prevent eating disorders (chapter 14).

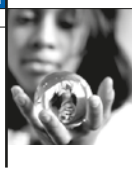
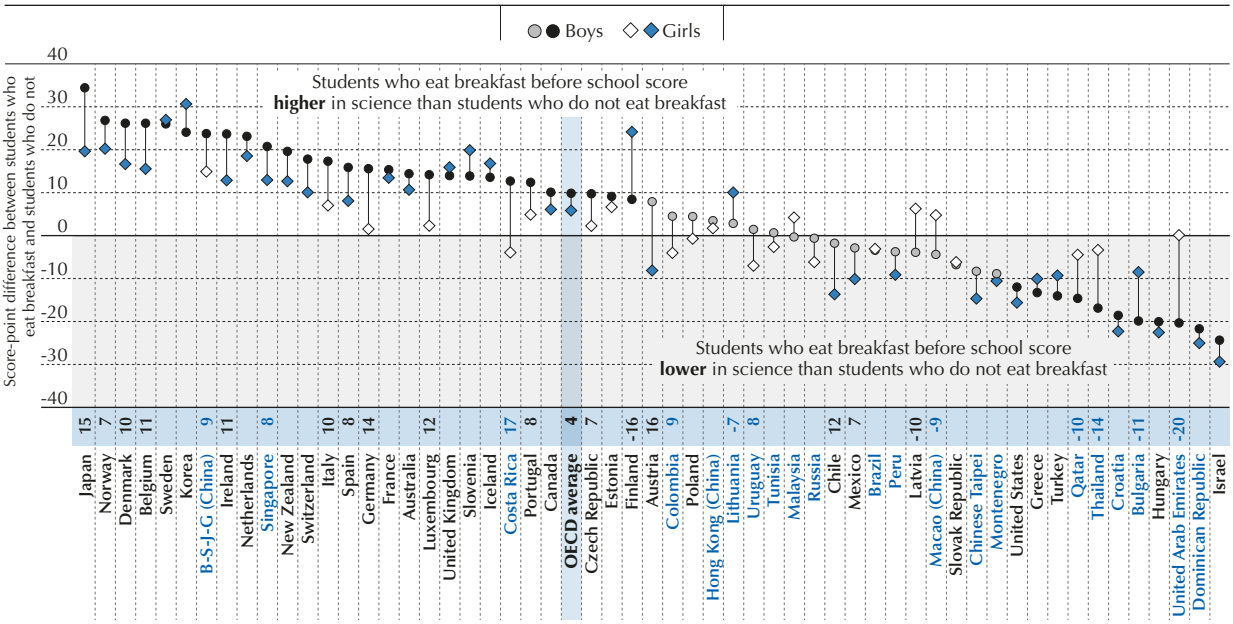


Figure III.11.12 ■ **Eating breakfast and science performance**

Score-point difference in science performance, after accounting for students' socio-economic status



Notes: Only countries and economies with valid values for both genders are shown.

Statistically significant differences between students who eat breakfast and those who do not are marked in a darker tone. Statistically significant differences between boys and girls are shown next to the country/economy name (see Annex A3).

Countries and economies are ranked in descending order of the score-point difference associated with eating breakfast, among boys.

Source: OECD, PISA 2015 Database, Table III.11.25.

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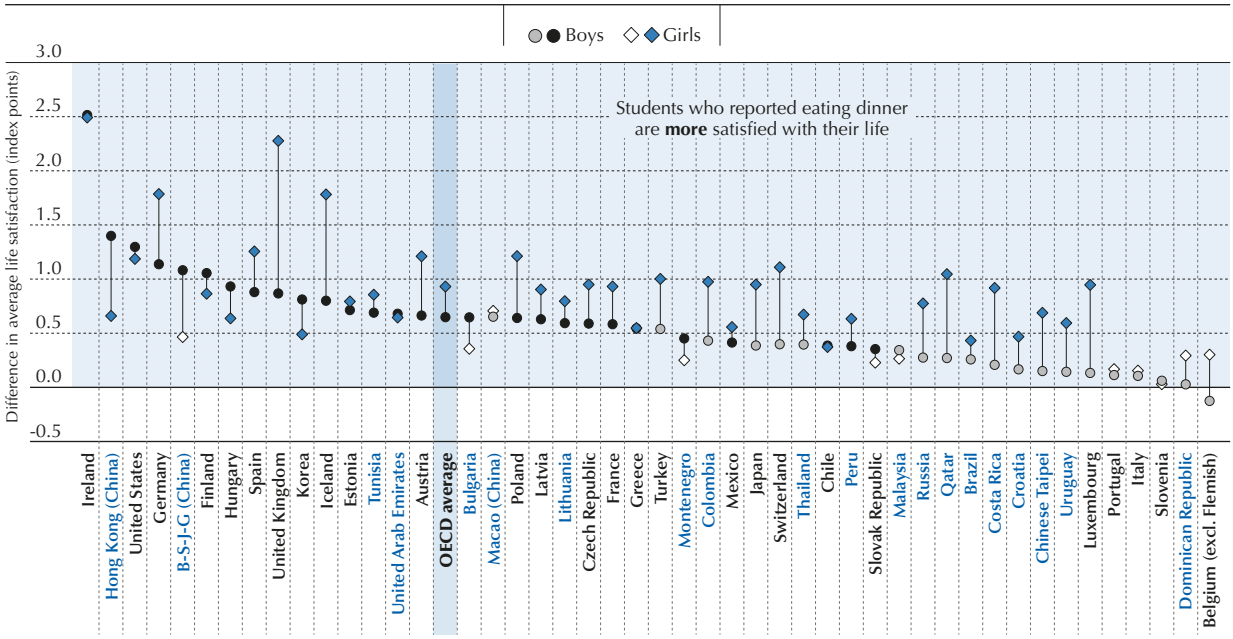
Figure III.11.13 ■ **Eating dinner and life satisfaction, by gender**

Difference in life satisfaction associated with eating dinner, after accounting for students' socio-economic status



Notes: Only countries and economies with valid values for both genders are shown.

Statistically significant differences are marked in a darker tone (see Annex A3).

Countries and economies are ranked in descending order of the difference in average life satisfaction among boys, by whether or not they eat dinner.

Source: OECD, PISA 2015 Database, Table III.11.28.

StatLink http://dx.doi.org/10.1787/888933472983

Box III.11.3 Eating disorders among adolescents

In most industrialised economies, healthy bodies are regarded as an ideal, but thinness is often equated with beauty. This mixed message may produce an obsession with weight that is particularly distressing for adolescents. Eating disorders among teenagers, such as binge eating, bulimia or anorexia nervosa, can pose serious health risks (Zipfel et al., 2000) and psychosocial problems (Herpertz-Dahlmann et al., 2001). In severe cases, anorexia can lead to death, through suicide or medical complications (Fairburn and Harrison, 2003; Pompili and Tatarelli, 2005). In a recent meta-analysis of 35 published articles, the crude mortality rate for anorexia nervosa was about 0.51% (Smink, van Hoeken and Hoek, 2012).

Different eating disorders share common symptoms, and individuals can be diagnosed with multiple disorders. For example, those with symptoms of anorexia and bulimia both tend to base their feelings of self-worth on their (usually distorted) view of their own body weight and shape (Fairburn and Harrison, 2003). Some 20-30% of bulimics previously had anorexia (Kaye, 2008).

Eating disorders can be triggered by a variety of factors, including dissatisfaction with one's own body, a distorted image of one's body, depression, low self-esteem, excessive dieting, compulsive behaviour, stress, social or cultural pressure to be thin, bullying or problems with friends, genetic predisposition, difficulties with family members, and stressful events in the family (Nilsson et al., 2007; Kaye, 2008; Fairburn and Harrison, 2003). Because many of these risk factors are related to psychosocial and mental health, treatments for eating disorders often include psychotherapy and can sometimes involve antidepressants or antipsychotics (Jaite et al., 2013).

Eating disorders are more commonly found among girls and young women, particularly those between the ages of 15 and 19 (Smink, van Hoeken, and Hoek, 2012). Around 90% of patients diagnosed with eating disorders are teenagers or young women (Kreipe and Birndorf, 2000).

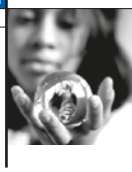
Studies in Australia, Denmark, the Netherlands, Norway and the United Kingdom have found slightly increasing prevalence rates for all types of eating disorders, except bulimia, particularly among adolescent girls (Currin et al., 2005; Mitchison et al., 2012; Steinhausen and Jensen, 2015; von Soest and Wichstrøm, 2014; Smink, et al. 2016).

The prevalence of eating disorders tends to be higher in Western countries (Makino, Tsuboi and Dennerstein, 2004). Frequent exposure to mass-media images that convey the notion that thin bodies are the ideal is related to dissatisfaction with one's own body, particularly among women (Grabe, 2008). According to HBSC data, 43% of 15-year-old girls and 22% of boys that age reported that they are too fat, and in all of the participating countries, girls were at least twice as likely as boys to report so.

Adolescents who are identified and treated early in the course of an eating disorder have a significantly better chance of recovery when compared with those who have been living with an eating disorder longer. However, the median duration of treatment delay is extraordinarily long for eating disorders, partly because people with eating disorders experience significant barriers to seeking help. A person who has an eating disorder may need guidance and support from those around him or her to take the first steps towards preventing or treating an eating disorder. It is therefore important that educators deepen their understanding about eating disorders. School strategies to prevent, intervene early and manage students' eating disorders can reduce the stigma and misconceptions that surround eating disorders.

What these results imply for policy

- Schools can encourage and organise regular physical activity to reduce the negative effects on well-being of not engaging in any kind of moderate or vigorous physical activity outside of school.
- Providing counseling to those students who are at risk of developing eating disorders may be beneficial, particularly for girls. Schools can work with parents, communities and social services to address issues related to eating habits.



Notes

1. The PISA estimates on skipping breakfast represent an upper bound of the actual percentage of students skipping breakfast. Some students may choose to have breakfast when they arrive at school if their schools offer breakfast. Because the PISA questionnaire only asks if students had breakfast before going to school, some of these students may appear as if they skipped breakfast when in fact they did not.

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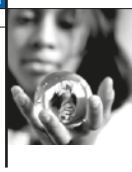

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