

The contribution of physical activity (PA) to the cognitive development and mental health of children and adolescents

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ABSTRACT

Compared to previous generations of children and adolescents, we are witnessing a change in lifestyle habits as younger generations of young people around the world have become predominantly sedentary. Levels of physical activity (PA) are rapidly decreasing, while research on its benefits is increasing. Continuous PA has been shown to be associated with a range of health benefits, including cognitive development and mental health. In children and adolescents, regular PA can positively contribute to cognitive development and provide numerous psychological and physiological benefits. These benefits are particularly applicable to childhood and adolescence, as these life stages are receptive to the adoption of healthy habits and lifestyles by preventing the onset of various forms of disease and promoting positive mental health.

The aim of this poster is to provide a critical overview of the contribution of PA to the cognitive development and mental health of children and adolescents and to draw conclusions based on a comprehensive analysis.

PHYSICAL ACTIVITY (PA) IN CHILDREN AND ADOLESCENTS

THE LATEST HBSC (HEALTH BEHAVIOUR IN SCHOOL AGED CHILDREN, 2018) REPORT:

- the proportion of male and female students who are engaged in moderate to intense physical activity decreases with age
- students who are physically active for at least 60 minutes a day decreases from 30.9% at the age of 11 to **27.5%** and to **21.4%** at the age of 13 and 15
- a decline - for female students, from 25.1% at the age of 11, to 21.6% at the age of 13 and to 13% at the age of 15
- CROATIA** - a decline in the PA of Croatian fifteen-year-olds in the last few decades - the highest proportion of physically active male and female students in this age group was observed in **2002** (33.5%), before falling to 25.4% in 2014 and **21.4%** in 2018 (Capak, 2020).
- a high proportion of insufficiently active young people who are not involved in structured leisure activities after school, as well as an insufficient level of motivation to get involved in it (Belošević & Ferić, 2022)

strategies to encourage the motivation and involvement of children and young people in various activities, in order to achieve the recommended amounts through free time

PHYSICAL ACTIVITY (PA) AND COGNITIVE DEVELOPMENT IN CHILDREN AND ADOLESCENTS

ACADEMIC ACHIEVEMENT	ATTENTION	LANGUAGE AND MEMORY
particularly important during adolescence and early youth and may be a key determinant of cognitive development during adulthood (Singh et al., 2012) - this period of growing up is characterized by the greatest drop in PA levels during life (Eaton et al., 2012), while this developmental phase is characterized by the rapid development of the executive functions of the prefrontal cortex (Lebel et al., 2008)		
<ul style="list-style-type: none">✓ positive correlation of PA with cognitive and school achievements (an average of 75% of studies support a positive association) (Esteban-Cornejo et al. (2015)✓ PA as a predictor of higher average school grades (de Greef et al., 2018)✓ a high degree of variability and inconsistency regarding the quality of the studies and the results obtained (Howie and Pate, 2012)✓ still not possible to draw final conclusions	<ul style="list-style-type: none">✓ positive correlation of PA with improved attention and concentration (Trudeau and Shephard, 2008; Vanhelst et al., 2016)✓ physically fitter adolescents had better selective attention and concentration (Reigal et al., 2019)✓ cardiorespiratory fitness - one of the variables that better explains the connection between children and youth and selective attention and concentration (Reigal et al., 2019)✓ even short-term 12-minute aerobic activity improves selective attention in children (Tine, 2014)	<ul style="list-style-type: none">✓ the positive impact of PA on the development of a wider lexical network and understanding of word meaning, as well as a better ability to detect syntactic (Scudder et al., 2014) and spelling errors (Mullender-Wijnsma et al., 2016)✓ robust relationship between PA and transient attention enhancement, but inconsistent for other aspects of cognition, such as memory✓ inconsistent results of meta-analyses, but not to the point of ignoring the indisputable fact of benefit of PA in any form for any aspect of executive functions or cognitive development in general compared to sedentary lifestyle

PHYSICAL ACTIVITY (PA) AND MENTAL HEALTH IN CHILDREN AND ADOLESCENTS

PARTICIPATION IN PA
<ul style="list-style-type: none">✓ prevention of the development of anxiety and depressive symptoms (Hosker et al., 2019)✓ correlation with a reduced risk of developing depression (Jerome et al., 2022; Schuch et al., 2018) and suicidal ideation in young people (Jewett et al., 2014)✓ longitudinal studies - adolescents who participate more often in PA - more resistant to the development of depressive symptoms (Mcphie and Rawana, 2015)✓ contribution to the treatment of depression in young people with an already developed clinical picture (Pascoe and Parker, 2019)✓ positive outcomes such as the development of social-emotional skills and contribution to the positive development of children and young people. On the other hand, negative experiences of participation in activities, such as stress and conflict, are associated with negative outcomes, such as delinquency (Belošević & Ferić, 2022).✓ youth with impaired mental health or with diagnosed disorders are less likely to participate in TAs (Griffiths et al., 2016), while those with fewer depressive symptoms are more likely to participate in activities (Eime et al., 2013) – missing out on the physical and mental health benefits they can gain through participation in TAs (Fortnum et al., 2021)✓ finding ways to increase participation in TAs and reduce symptoms of anxiety and depression among young people should be a public health priority✓ the high prevalence rate and negative outcomes associated with impaired mental health in young people indicate the importance of identifying cost-effective interventions aimed at promoting mental health, including PA

IT IS IMPORTANT TO:

- look at PA through a **holistic approach** in order to fully understand all its benefits on the overall development of children and adolescents
- understand the need to implement a **program of mental health promotion and prevention of mental health disorders** as the first and most important step
- remember that **PA is a non-stigmatizing and easily accessible intervention** without unwanted consequences that can help young people to promote positive mental health and treat problems and symptoms of impaired mental health
- **not forget that giving up and stopping regular PA is on the rise with entering adolescence, coinciding with the average age of onset of mental health problems**
- consider the **motivation** for participation in activities, the development of relations with the implementers of activities and other participants, the **experiences** of participating in activities and the general context of the implementation of activities

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