

The Impact of Sedentary Behavior on Health and the Need for Physical Activity in Children and Adolescents

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Abstract: Children and adolescents do not practice enough physical activity or have too much unbalanced nutrition, and the consequence of these unhealthy and bad habits is overweight that can lead to obesity, impairment of health and, implicitly, the quality of life.

The objective of the study is to summarize the evidence of published literature on the impact of sedentary lifestyle on the health of children and adolescents, the benefits of regular physical activity, as well as recommendations for their correct performance.

Results: All researched works combines regular physical activity with important health benefits. Children and adolescents aged 5-18 must be physically active for at least 60 minutes a day, with intense physical exercise being associated with the majority of authors with a better physical condition and well-being. The physical activity program should include exercises that address all fitness components: cardiorespiratory capacity, muscle strength / fitness, flexibility and body composition.

Conclusions: Some action is needed to promote a healthy lifestyle and increase physical activity to at least 60 minutes a day, in order to reduce the sedentary behavior among children and adolescents due to excessive use of the Internet, social networks or audiovisual media. Implementation and support of programs to promote physical activity among them is necessary, given the increasing number of overweight and obese persons.

Keywords: physical activity, sedentary, health, obesity, children.

How to cite: Damian, M., Oltean, A., & Damian, C. (2018). The Impact of Sedentary Behavior on Health and the Need for Physical Activity in Children and Adolescents. *Revista Romaneasca pentru Educatie Multidimensionala*, 10(1), 71-83.

<https://doi.org/10.18662/rrem/19>

Introduction

Children and adolescents do not practice enough physical activity or have too much unbalanced nutrition, and the consequence of these unhealthy and bad habits is overweight that can lead to obesity, impairment of health and, implicitly, the quality of life.

Increased obesity due to lack of regular physical activity and unhealthy nutrition in terms of feed intake and increased calories number is worrying. Specifying nutrients classifies foods according to their nutritional composition in order to prevent disease and promote health (World Health Organization, 2010), (World Health Organization, 2006), (WHO, 2006). Children and adolescents spend too much time in the virtual world (smart phone, video games, social networks etc.) and audiovisual media and too little time on the sports ground or other physical activity, which negatively affects the their morphological, functional and biological development. According to the Interview (Livingstone, 2001) and Examination Health (Stanner, 2004) (KiGGS) study, quoted by (Graf et al., 2014) German children and adolescents aged between 11 and 17 spend an average of 3.8 hours (boys) and 2.7 hours (girls) per day in the audiovisual media and video games. The physical activity, health and quality of life are in close correlation, influencing each other; the human body needs regular physical activity for optimal functioning (Arion, Dragomir, & Popescu, 1983; Victor, Strasburger, & Amy, 2010). Many researchers have shown that sedentary lifestyle is a risk factor for the occurrence and evolution of coronary heart disease (cardiovascular diseases and diabetes), and the need to promote physical activity and avoid sedentary behavior, particularly by reducing the consumption of media (American Academy of Pediatrics , 2001), (Proper, Singh, Van, & Chinapaw, 2011), (Arion et al., 1983), (Strasburger, 2010).

Theoretical background

The physical activity is defined as "any kind of movement of the body associated with muscle contraction that increases energy expenditure above the resting level" (National institutes of health consensus development panel on physical activity and cardiovascular health Physical activity and cardiovascular health, 1996), (Aznar & Webster, 2006), (Casperser, Powell, & Christenson, 1985). Physical inactivity is a term that describes a person who does not regularly perform at least 60 minutes of physical activity per day, 5 days per week (Biddle, Sallis, & Cavill, 1998), (Life style and behavior: physical activity and inactivity, 2016).

Sedentary behavior is defined as "any behavior characterized by energy consumption ≤ 1.5 Metabolic Equivalents (MET),(De Rezende, Rodrigues, P., K., & C., 2014) while the body is in inclined posture or wakefulness." The obesity is a chronic condition of nutrition characterized by increased body weight due to fatty tissue resulting from a lack of correlation between increased caloric intake and low energy expenditure (Arion et al., 1983) due to lack of physical activity.

Health is a fully favored state, physically, mentally and socially, and not just the absence of illness or infirmity."

Initiatives to promote physical activity among children and adolescents

Numerous researches (Bos, 2003), (Parlamentul, 2007), (U.S., 1996), (Graf et al., 2014; Kimm et al., 2002), (Aznar & Webster, 2006), (Van der Ploeg, Chey, Korda, Banks, & Bauman, 2012), (Kiens et al., 2007) showed that the number of sedentary children and adolescents is getting higher. Some of the EU Member States have developed "Physical Activity Guidelines" that help government structures and private bodies collaborate to promote physical activity:

- France: Ministère de la Santé et de la Solidarité (2005): Programme Nutrition Santé: Activité physique et santé;

- Germany: Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz, Bundesministerium für Gesundheit (2007): Gesunde Ernährung und Bewegung - Schlüssel für mehr Lebensqualität.

- United Kingdom: Office of the Deputy Prime Minister; Local Government Association; Department of Culture, Media and Sport; Sport England (2004): Sport and Physical Activity in 2nd Generation Public Service Agreements: Guidance Notes. DCMS, Sport England (2008): Shaping Places through Sport and Health.

- World Health Organization (WHO, 2010): Global Strategy on Nutrition, Physical Activity and Health (Orientările UE privind activitatea fizică Aprobate de Grupul de lucru al UE „Sport și sănătate” Confirmate de ministrii sportului din statele member ale UE în cadrul reuniunii de la Biarritz din 27-28 noiembrie 2008).

School and family can play a decisive role in promoting an active and healthy lifestyle, supported by the EU Sport and Health Working Group (2008), which estimated that up to 80% of school-age children are engaged in physical activity only at school and that they should have at least one hour of light physical activity daily (NIH, 1996). To spend enough time for physical and sports activities in school or other extracurricular activities is related to health benefits (Chief Medical Officer, At Least Five a Week).

Excepting the physical education classes in the school, the family plays an important role in involving children and adolescents in physical or sports activities (Bowman, 2006).

Objective

The objective of this narrative review is to summarize the evidence of published literature on the impact of sedentary lifestyle on the health of children and adolescents, the benefits of regular physical activity, as well as recommendations for their correct performance.

The impact of sedentary lifestyle on health

The human cost of sedentary lifestyle is unacceptable, young people being the future of every nation. Physical inactivity is a major challenge to public health and is recognized as a global epidemic (R. Andersen, E., Crespo, Bartlett, Cheskin, & M., 1998). The inactivity causes 1.9 million worldwide deaths annually, as per World Health Report (2000) (Speiser et al., 2005). There are numerous studies, systematic reviews and meta-analyses that show that adult sedentary lifestyle has been positively associated with type 2 diabetes, cardiovascular disease, metabolic syndrome, and mortality (Dietz & Gortmaker, 1985), (Thomas, 1999), (Van der Ploeg et al., 2012), (Bauman, 2012), (National Institute for Health and Care Excellence, 2014), but in the case of children and adolescents the evidence is not very conclusive, (Van der Ploeg et al., 2012), ((Powell, Thompson, & Caspersen, 1987), (Powell et al., 1987), (BHF, 2000), (Thorp, Owen, Neuhaus, & Dunstan, 2011). Blair (2009) states that physical inactivity with early years of life contributing to increased obesity and other serious medical conditions, is now considered a major problem of children and adolescents in Europe and the world (Kohl, 2001), (Strasburger, 2010), (SRBN, 2012), (Kiens, et al., 2007), (K. M. Karlsson, Stenevi-Lundgren, Linden, & Gardsell, 2006; M. Karlsson, 2002), Dietz and Gortmaker (Gortmaker et al., 1996) were the first to establish the relationship between excess audiovisual and the increased risk of overweight and obesity (Salmon, Bauman, Crawford, Timperio, & Owen, 2000).

While knowing the benefits that physical activity brings to health, sedentary behavior among children and adolescents due to the excessive use of smart phones, video games, social networks or the audiovisual media is increasing (Butcher, 2003), (Diaz & Daichi, 2013), (SBU, 2004), (Expert Panel on Blood Cholesterol Levels in Children and Adolescents), (Fletcher, Blair, & Blumenthal, 1992), (Biddle et al., 1998; Sallis, Prochaska, & Taylor,

2000). A study made in 8 European countries presents that the predisposition for overweight and obesity in children aged between 10 and 12 was significantly lower in Switzerland, attributable to a reduced percentage of time spent in front of the television and a percentage high physical activity (Butcher, 1983).

Physical inactivity is a factor that increases the risk of cardiovascular disease in children and adolescents (ADA, 1999). In Spain, most young people are not physically active enough to register health benefits (Alpert & Wilmore, 1994). The Health Behavior in School-Aged Children (HBSC), conducted in 2005/2006, 2009/2010 and 2014/2015, shows that children and adolescents in Romania occupy the last positions in Europe with regard to daily physical activity, Romania being the only country to which sedentary behaviors are more common in families with a high socio-economic level (Graf, et. al., 2014). The French National Institute for Health and Medical Research (INSERM), in its report entitled "Retrouver to liberté de mouvement" by Professor Toussaint in 2008, argues that "physical exercising" and nutrition are essential to achieving an energy balance in all ages (Ekelund, Brage, Froberg, Harro, & Anderssen, 2006)

Benefits of Regular Physical Activity to Health

The need to reduce sedentary lifestyle and increase physical activity is indisputable (Biswas et al., 2015; NICE, 2009) (PAGAC, 2008) There is clear evidence of the benefits that regular physical activity brings to children and adolescents: improving cardiorespiratory capacity, muscle tone, bone health, cardiovascular and metabolic health biomarkers, body composition, and low risk of depression. Regular physical activity improves both the quality of life and its longevity, significantly by reducing the risk of morbidity and mortality due to: coronary heart disease (S. N. Blair, Cheng, & Holder, 2001), (Kopelman, 2000), (Life style and behavior: physical activity and inactivity , 2016), (NIHCE, 2009), (Orientările UE privind activitatea fizică Aprobate de Grupul de lucru al UE , 2008), (Pratiques sportives , 2015), (Aaron, Kriska, & Dearwater, 1993), hypertension (Epstein, Wing, Koeske, & Vaoski, 1985), (Chinapaw, Altenburg, & Brug, 2015), (Bostock, 2001) type I diabetes mellitus, (Epstein et al., 1985; Lee et al., 2012),(AAP, 2001) certain cancers (MS, 2015), (Verloigne, Loyen, & Van Hecke, 2016), (Howard et al., 2008) and osteoporosis (Haskell et al., 2007), (Hegde & Solomon, 2015), (WHO, 2014).

The physical activity associated with balanced nutrition can contribute to favorable outcomes in the treatment of obesity. Food is the

source of nutrients, and to get the nutrients we need, we require a varied and well-balanced diet (Teodor, 2017a).

The prevention has a particular importance in this context (Department of Health, 2004), (Swinburn & Shelly, 2009). Studies show that 30-minute of aerobic exercise performed three times a week for at least three months can provide a lowering of blood pressure in hypertensive children and young adults aged 11 to 21 (L. B. Andersen et al., 2006) . A high level of physical activity during child growth and development reduces the risk of developing cardiovascular disease in adulthood (Department of Health, 2004). Although researches are reduced in number in comparison to researches on adults, evidence of the benefits of regular physical activity on the health of children and adolescents is evident. Consultative Committee of USA The Department of Health and Human Services (2008) evaluated the evidence from research (Jenvey, 2007), on the benefits that physical activity (Eisenmann, 2004) brings to the health of children and adolescents as being strong, moderate and weak. Strong evidence: Improving cardiorespiratory capacity, cardiovascular and metabolic health biomarkers, improving muscle and bone health and body composition. Moderate evidence: low risk of depression (Pate, Pratt, & Blair, 1995). Children can increase muscle strength by 14-30% through specific training, a twice weekly frequency being recommended for increased muscle strength (S. N. Blair & Connelly, 1996). The significant effects of physical training on skeleton occur before puberty (Janssen, 2007; Janssen & Leblanc, 2009), (Kimm et al., 2002).

Recommendations on physical activity in children and adolescents

Global recommendations on physical activity in children and adolescents aim to highlight and promote the need for it, the benefits that it brings to health and the rules of age and fitness. Existing data and recommendations encourage children and adolescents to practice at least 30-60 minutes of regular physical activity per day (Arion et al., 1983), (Berg, 2010), up to a few hours a day), (Aaron et al., 1993), (MF, 2011-2015), (Gerhardsson de Verdier, Steineck, Hagman, Rieger, & Norell, 1990), (SNIPHPA, 2010). During and after mild or moderate physical activities lasting more than one hour, water consumption is required to keep body temperature stable and prevent dehydration (Teodor, 2017b). The World Health Organization (NHS, 1996; WHO, 2010, 2015) recommends children and adolescents aged 5 to 17 to cumulate daily at least 60 minutes of aerobic physical activity of moderate and increased intensity and exercises for the development of muscles, among the recommended physical activities being

jogging, sports, walking, physical school education or physical activities in the context of the family or community (Verloigne et al., 2016), (Pate et al., 1995). National Institute for Health and Care Excellence, NICE recommends physical exercise for muscle strength, flexibility, and bone system to be performed at least two times a week, divided by inches of at least 10 minutes [60]. Physical activities exceeding 60 minutes offer additional health benefits (Physical activity for children and young people Public health guideline, 2009), (Herzig et al., 2012; Verloigne et al., 2016). The Medical Director of Great Britain's Government has issued a series of guidelines on physical activity by age group:

- Children (0-5 years) who are able to walk without help must be physically active for at least three hours (180 minutes) within a day.
- Children and young people (5-18 years) should be physically active for at least 60 minutes per day and should reduce the time of inactivity as much as possible (Lampert, et. al., 2007)

Guidelines for children and adolescents	
Aerobic capacity	60 minutes a day moderate or intense aerobic physical activity. intense physical activity at least 3 days a week. for additional benefits > 60 minutes a day.
Muscle resistance	In the 60 minutes of daily physical activity, children and adolescents must include exercise to strengthen the muscles for at least 3 days a week.
Strengthen the bone system	In the 60 minutes of daily physical activity, children and adolescents should include exercises for strengthening the bones at least 3 days a week.

Source: 2008 Physical Activity Guidelines for Americans

Conclusions

The current studies associate regular physical activity with important health benefits. More researches on the impact of sedentary lifestyle on health can be useful in developing new strategies for promoting physical activity. The implementation and support of programs in order to promote physical activity among children and adolescents is necessary, given the growing number of overweight and obese young people. Promoting a healthy lifestyle by reducing sedentary behavior due to excessive use of the internet or audiovisual media as well as increasing physical activity is indispensable. School and family can play a decisive role in promoting an active and healthy lifestyle. Physical activities for children and adolescents

must be appropriate to age, fitness, as well as to be attractive, varied and complex.

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