Barriers to active participation of school-aged children
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This thesis focuses on active participation among school-aged children and its association with health. Moreover, it tries to contribute to the understanding of perceived barriers to such participation, especially in adolescents with health conditions. This chapter briefly describes the theoretical background of this study and its main aims and research questions.

1.1 Active participation among adolescents

The period of adolescence represents a huge potential for growth and development, which might significantly affect the adoption of healthy behaviour patterns (Lerner, 2005). Resources for healthy development are not only in the adolescents themselves but also in the social context (family, school, community, etc.) in which adolescents mature. Active participation in social relationships (e.g. family, peer group, school and community), leisure-time activities and school activities are an essential vehicle for healthy development in adolescence, as such participation might generate essential developmental opportunities.

1.1.1 Participating in social relationships

Participation in social relationships builds social networks and resources of social support which are essential for healthy development. It enhances well-being and health directly by meeting basic human needs for companionship, intimacy and a sense of belonging, while promoting a positive self-concept, as well as individual coping resources, e.g. problem-solving abilities, access to new contacts and information and perceived control, which are important in the prevention of health problems (Heaney & Israel, 2008). The drive for a greater autonomy and independence is reflected in more leisure-time spent with peers and outside the family. Nevertheless, the family remains an important part of adolescents’ lives, especially through support for spending time together and joint activities (Offer, 2013). This chapter will focus on participation in family activities and peer activities. Participation in social relationships with teachers and classmates will be discussed in a separate chapter.

1.1.1.1 Family activities

Parents share various activities with children, and the prevalence and nature of various family activities differ by age and gender, reflect
cultural differences in countries and are changing over time. Based on Bandura’s social learning theory (1971), adolescents’ behaviour is shaped by their parents through learning by observing particular behaviour and activities which parents do in their leisure time are models for imitating. Model activities, like doing sports or walking together, might influence health via promoting an active life style, while the others might be rather a source of emotional support and influence health despite their sedentary nature. Spanish adolescents reporting high frequency and enjoyment of family activities (watching TV or video, playing indoor games, eating meals, going for a walk, going places, visiting friends or relatives, playing sport, sitting together and talking about things together) also reported a higher health-related quality of life (Jimenez-Iglesias et al., 2015) and lower tobacco, alcohol and marijuana use (Jimenez-Iglesias et al., 2013). Taking part in activities, such as sharing meals, has sometimes been associated with a positive well-being as well as with improved nutrition of young people (Brooks et al., 2015). Moreover, the co-playing of computer games with parents by girls has also been associated with a lower prevalence of depression and increased parent–child connectedness (Coyne et al., 2011).

Parents and their children spent on average only 2.4 minutes per day performing moderate-to-vigorous physical activity but 92.9 minutes in sedentary behaviour together (Dunton et al., 2012). The most frequent sedentary family activities were watching TV, playing computer games, talking about troublesome things or eating meals together (Inchley et al., 2016; Vokacova et al., 2016; Berntsson & Ringsberg, 2014). Evening meals shared with parents every day were reported by 63% of the 11-year-old, but only 45% of the 15-year-old respondents of the Health Behaviour in School-aged Children study conducted in 2013/2015 in more than 40 countries. High variation was found between countries, e.g. Slovak 15-year-old adolescents rated very low, with less than 16% of them reported sharing evening meals with parents every day (Inchley et al., 2016). Moreover, the prevalence of eating together with parents showed a decreasing tendency between 2002 and 2014 in Czech school-aged children (Vokacova et al., 2016), which might mean fewer opportunities to talk to each other and comfort each other (Offer, 2013). The prevalence of playing sport together or going for a walk are not as common as less active family activities (e.g. watching TV, eating together or sitting and talking together), but its prevalence increased in the period 2002-2014 (Vokacova et al., 2016). Taking into account that parental physical activity might play an important role in combating child obesity (Sijtsma et al., 2015), the increasing prevalence of active family activities might improve resources for health promotion within a family.

The nature of family activities differs by age and gender. Younger adolescents get involved in joint family activities more than their older counterparts (Vokacova et al., 2016), and the composition of activities differs between younger and older adolescents. The most common activities for younger children were sporting events, visiting the cinema, doing homework or playing computer games. For older children, these were watching TV, going shopping together or to concerts (Berntsson & Ringsberg, 2014). Even more, the gender of parents plays a role in the frequency of particular activities. According to Kaspersky & Smahel (2016), watching TV or videos is the most preferred activity with mothers as well as with fathers. However, fathers reported playing games on digital devices more often as well as playing sports with their children in comparison with mothers.

1.1.1.2 Peer activities
Adolescents spend considerable time with their peers, either through direct or online relationships, and this affects their active participation in daily activities. The international Health Behaviour in School-aged Children (HBSC) study suggests that on average 19% of boys and girls reported meeting with friends before 8 o’clock in the evening every day, and this percentage increases with increasing age (Inchley et al., 2016). Spending time with friends is very important for adolescents to access emotional support and a safe environment in which they might explore their identities (Malecki et al., 2003). Adolescents who perceive their friends as supportive experience higher levels of psychological well-being and have better social competence and fewer emotional and behavioural problems (Colarus & Eccles, 2003; Lenzi et al., 2012). As youth explore their emerging interests and identities, making friends with others and interacting with their peers through participation in extracurricular activities becomes increasingly important during adolescence (Dworkin et al., 2003).

However, some studies indicate that time spent with peers is associated with higher rates of risk behaviour (Tome et al., 2012). Especially unstructured activities, such as hanging out or meeting with friends in the evening, are predictive of antisocial and norm-breaking behaviours (Augustyn & McGloin, 2013; Haynie & Osgood, 2005; Hoeben & Weerman, 2016), or linked to worse school performance (Bae & Wickrama, 2015; Nelson & Gastic, 2009) and increased rates of substance use (Lee & Vandell, 2015; Spilková, 2015).

Time spent in personal contact with peers is as important as the time spent with them via electronic media (sms, chat, e-mail, social networks) (Kuntsche et al., 2009). Moreover, greater use of electronic media is associated with a higher level of personal contact with peers (Kuntsche et al., 2009). The Internet offers an opportunity for more personal or intimate communication and might be complementary to offline interaction. In most cases people from offline life are involved in the online possibilities (Livingstone et al., 2011).
1.1.2 Participating in leisure-time activities

Leisure time comprises approximately half of adolescents’ waking hours (Larson & Verma, 1999; Wight et al., 2009), and this time slot represents a huge potential for developmental opportunities or risks. The way adolescents’ use this potential depends on their internal assets (e.g. values, self-regulation) as well as on ecological assets (e.g. opportunities, support) (Bowers et al., 2014).

Research on leisure-time use has focused on the developmental benefits of a specific form of leisure, on organized and extra-curricular activities (Farb & Matjasko, 2012). Unlike school, household chores or personal care (e.g. sleep or hygiene), it offers room for a wide range of activities. It is therefore typified by more pronounced inter-individual differences in its content, as well as distinct associations with health and developmental indicators. Some sorts of activities (e.g. organized activities, physical activities) can be considered as health-enhancing and supporting development (Larson, 2000; Mahoney et al., 2006). Other activities, such as the unstructured ones, might pose a threat to adolescent health (Caldwell & Faulk, 2013). Special attention should be paid to screen-based activities, which today occupy an increasing amount of youth leisure time and overlap with other activities.

1.1.2.1 Organized leisure-time activities

Organized leisure-time activities (OLTA) are in fact exactly the opposite of unstructured activities (UA), as they are characterized by having a certain structure, a regular schedule, clearly defined goals and rules, focusing on skill-building and being adult-supervised (Larson, 2000; Mahoney et al., 2006). Participation in organized leisure-time activities (OLTA) is linked with a wide range of developmental and behavioural outcomes. For instance, focusing on school, participation in OLTA was associated with higher school engagement, lower levels of school-related stress and better academic achievement (Knifsend & Grahan, 2012; Badura et al., 2016). Moreover, participation in OLTA was associated with enhanced physical and mental health among all adolescents (Badura et al., 2015).

1.1.2.2 Unstructured leisure-time activities

On the other hand, the involvement of adolescents in unstructured leisure-time activities is frequently associated with problematic outcomes, though not all UA can be labelled as risky (Bradley, 2010; Sharp et al., 2015). Moreover, such activities can be associated with risky behaviour even more than a total lack of involvement in activities (Mahoney & Stattin, 2000). Youth who spend a lot of time in such activities with no or low structure have been reported as having higher rates of delinquency (Hoeben & Weerman, 2016; Svensson & Oberwittler, 2010; Weerman et al., 2015), substance use (Gage et al., 2005; Kiesner et al., 2010; Pulver et al., 2015), potentially risky sexual activity (Barnes et al., 2007) and poorer psychological adjustment (Trainor et al., 2010). In relation to computer use and playing computer games, a recent literature review suggests that excessive time spent on screen-based activities in children may be an outcome from the lack of structured leisure time (Blinka, 2014).

1.1.3 Participating in physical activities

One of the key factors of maintaining an adolescent’s health is physical activity. The World Health Organization (WHO) defines physical activity through activities like play, games, sports, transportation, recreation, physical education or planned exercise, in the context of family, school and community activities. According to a WHO (2010) recommendation, children and youth aged 5-17 years should accumulate at least 60 minutes of moderate-to-vigorous physical activity per day every day in order to achieve beneficial physical and mental health outcomes.

Appropriate levels of physical activity contribute to the development of healthy musculoskeletal tissues (muscles, bones), the cardiovascular system and neuromuscular awareness, while also facilitating the maintenance of a healthy body weight (Penedo & Dahn, 2005; Hallal et al., 2006; Strong et al., 2005; Iannotti et al., 2009b). Regular physical activity has been associated with psychological benefits in young people, as well. It might reduce social anxiety (Dimech & Seiler, 2011), symptoms of depression (Rothon et al., 2010) and improve sleep quality (Lang et al., 2013). On the other hand, low levels of physical activity during adolescence contribute to obesity and poor health outcomes, which may persist into adulthood (Penedo & Dahn, 2005; Riddoch et al., 2004; Strong et al., 2005). In addition, there is evidence that increased physical activity, including daily activities like active commuting to school, can improve academic and cognitive performance (Martinez-Gomez et al., 2011; Sibley & Etnier, 2003). Taking into account the positive consequences of regular physical activity, its potential should be considered in the compensation for the negative health consequences of excessive screen-based activities. Evidence is inconsistent, since some studies indicate that physical activity may also be combined with screen-based behaviour, which leads to compensation of high screen time (Ferrar et al., 2013). On the other hand, according to the displacement hypothesis, spending more time on screen-based behaviour is at expense of physical activity (Carlson et al., 2010).

1.1.4 Participating in school activities

Participation in school activities constitutes a significant influence on adolescent’s cognitive, social and emotional development (Wang & Dishion, 2012). A positive school experience is considered a resource for health
and well-being, while a negative one may constitute a risk factor, affecting mental and physical health. As a consequence, liking school has been identified as a protective factor against health-compromising behaviours (Bond et al., 2007). As for negative experiences, not liking school or low academic performance at school is associated with low self-rated health and well-being and increased somatic and psychological symptoms (Bond et al., 2007; Bird & Markle, 2012). Moreover, adolescents who reported low school connectedness and interpersonal conflicts in early secondary school were more likely to have mental health problems and to use substances in the later years of schooling (Bond et al., 2007).

Evidence also indicates that important factors exist leading to beneficial as well as adverse school outcomes. Experiencing social support from a number of sources, such as parents and family, peers, classmates and teachers contributes to adolescents’ adjustment, social skills and academic competence (Malecki & Demaray, 2003). On the other hand, insufficient quality and quantity of sleep and overall sleepiness have repeatedly been shown to be associated with decreased school performance (Dewald et al., 2010; Wolfson & Carskadon, 2003). Playing computer games has been shown to be associated with verbal memory performance through negative sleep patterns (Dworak et al., 2007). In addition, higher levels of school-related stress connected with the effort to be successful tend to be associated also with psychological complaints, such as feeling sad, tense and nervous (Ottova-Jordan et al., 2015), which may result in aggressive behaviour, such as bullying or physical fighting (Holubcikova et al., 2015). These behaviours have become a serious issue in schools. Despite the aforementioned determinants of school problems being indicated, the particular mechanism behind school problems and especially the route to them via excessive screen time has still not been fully understood.

1.2 Screen-based activities

With the development of information and communication technology, the use of screens has become very favoured and common, especially in adolescents (Bucksch et al., 2016), which might present a barrier to active participation, as we mentioned above. Excessive use of screen-based activities, supported by e.g. an absence of restrictive parental rules may be connected with negative health outcomes. Results of the EU Kids Online II survey (Livingstone et al., 2011) indicate that 9- to 16-year-old children use the Internet almost an hour and a half every day, and this amount increases steeply with age. Working with the Internet or playing games online daily was reported by 83% of European children (Livingstone et al., 2011).

Data has shown that high levels of sedentary behaviour, like being involved in screen-based media use (Iannotti et al., 2009b), is potentially detrimental to health (Biddle et al., 2010). Spending a high number of hours on a computer was related to physical problems, such as neck pain (Smith et al., 2008), recurrent backache and headache (Torsheim et al., 2010), sleep problems or musculoskeletal pain (Costigan et al., 2013). Furthermore, increasing any type of sedentary behaviour was associated with more psychological complaints, such as depression and well-being, lower social support (Costigan et al., 2013) and poorer self-esteem (Tremblay et al., 2011). However, computers and the Internet may be used and often are used by children as an educational resource – for information, schoolwork, etc. (Kalmax et al., 2009). Some studies show no or even a positive association of computer use with children’s school results (Skoric et al., 2009; Borzekowski & Robinson, 2005; Sharif & Sargent, 2006). From this perspective the negative effect of media consumption on academic performance is mostly a matter of how such media are being used and not necessarily of how much they are being used. Some studies have shown that while excessive time with traditional media (television) is reflected in poor academic achievement, high time spent with new media (computer, Internet) does not (Borzekowski & Robinson, 2005; Sharif & Sargent, 2006).

One of the key factors that influences the amount of time spent on screen-based activities is parental rules (Veitch et al., 2013). According to contextual model formulated by Darling and Steinberg (1993), parental rules, as specific control behaviour of parents, might express parental practices, which represent the mechanisms through parents directly influence their children’s behaviour. Data shows that children whose parents report low restrictions on sedentary activities were most likely to watch TV more than four hours per day. Moreover, a permissive parenting style is associated with increasing risk of excessive TV viewing especially among younger adolescents (Jago et al., 2011). Similar results have been found for playing on a computer. Adolescents who exceeded the recommended screen time, had no parental screen-viewing rules (Cillero et al., 2010) or who lacked parental restriction on Internet use were more likely to report an increased amount of time spent online (Helsper et al., 2013). Evidence is lacking in regard to screen-based activities among adolescents with different types of chronic conditions. Moreover, it seems important to focus further research on associations with psychosocial determinants, including parents and school environment, as their outcomes may have an essential role in promoting healthier ways of spending leisure time. Such research should also be focused on how parents through joint activities might contribute to involving their children in more active ways of spending time, which might be beneficial to their health.

1.3 Adolescents’ health conditions and active participation

Living with and managing a chronic condition, such as diabetes mellitus or asthma, constitutes a major challenge for adolescents, especially in connection with participation in their social environment. The incidence and
prevalence of chronic conditions among adolescents is steeply increasing every year, particularly in children under the age of 15 years (IDF, 2015). Up to 15% of adolescents are living with chronic health conditions, such as asthma, diabetes or visual impairment (Michaud et al., 2007).

The presence of such a health condition requires management of the condition and a patient’s adherence to daily treatment. This in many cases limits a lot of areas of an adolescent’s everyday life, including his or her family, peers or school (Lindsay et al., 2011). The way children perceive their disease as well as their adaptation to a chronic condition is a dynamic and changeable process and can be moderated by several factors, such as perception, exposure to cultural/familial beliefs (Barros, 2003) or a construction of the concepts of health and illness (Taylor et al., 2008). Thus, comprehension related to the impact of a chronic condition is strongly affected by culture and by the socialization process and influences its integration in the adolescent’s life context (Barros, 2003). The International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) model classifies functioning and disability associated with health conditions in children. It is designed to record the personal characteristics of a developing child and the influence of his or her surrounding environment (WHO, 2001).

As illustrated in Figure 1.1, a child’s level of functioning is the result of a dynamic interaction between her or his health conditions, environmental factors and personal factors. All determinants of disability are important, and all of them may interact with another. The interaction works in two directions; the presence of disability may modify the health condition itself (WHO, 2007). Participation is defined by the ICF-CY model as involvement in a life situation (WHO, 2001; WHO 2013). In the terms of this thesis, participation describes the extent to which a child is socially engaged in child-relevant life situations, such as social relationships, home life and education or organized leisure-time activities (King et al., 2007). This participation is affected by health conditions as well as personal factors, which might be connected with perceived environmental or personal barriers. Adolescents with a chronic condition are more likely than their peers to miss school due to their condition or treatment, which might affect their school attendance (Michaud et al., 2005). Because of various limitations related to their treatment and changes of lifestyle, adolescents with a chronic condition might feel in several cases different from their peers, which might lead to exclusion from their peer group and social isolation (Suris et al., 2004). At the same time, requirements regarding compliance with the sometimes complex management of a chronic condition are also related to family functioning (Tsouli et al., 2013; Droter et al., 2013). Moreover, insufficient active participation might be compensated by higher engagement in screen-based activities.

Active participation in terms of regular physical activity is important not only for healthy adolescents but also for children with a chronic condition like diabetes mellitus because of health-related beneficial effects (Michaliszyn & Faulkner, 2010; Aman et al., 2009) and improvement of a patient’s quality of life (D’hooge et al., 2011). However, children with Type-1 Diabetes Mellitus (DM-1) are less engaged in physical activities (Tully et al., 2016) and do not meet WHO recommendations (2010) of moderate-to-vigorous physical activity 60 minutes per day every day. A systematic review suggests that a wide range of personal, social or environmental barriers might inhibit their interest in physical activity (Shields et al., 2012). The barriers to participation in physical activity have been studied more comprehensively than the facilitators to participation. Both include a lack of knowledge on the role of the child’s preferences, fear, parental behaviour, a negative societal attitude to the disability, the adequateness of the facilities, transport, programmes and staff capacity and extra costs (Shields et al., 2012). The reported barriers and facilitators to participation can differ according to whose views are elicited. Children with a disability tend to focus on personal factors, while parents focus on familial, social, policy and programme factors (Shields et al., 2012). Most published studies in this area have sought only the perspectives of children with disability or their parents, and only a small number have included the views of other stakeholders, such as professionals who work in the sport and recreation sector (Carter et al., 2014; Shields et al., 2014). One small study did explore the perspective of 24 sports and recreation industry personnel only (Shields et al., 2014). Based on content analysis of a short survey in this convenient sample, it found the most common perceived barriers to be inaccessible facilities, non-inclusive providers, lack of transport, lack of
relevant opportunities and increased costs. The most common perceived facilitators reported were welcoming providers, parental support, inclusive providers, adaptable approaches and accessibility of facilities. All types of barriers to active participation might be connected to the research findings that adolescents with different types of chronic conditions are highly involved with a sedentary lifestyle (Walker et al., 2015). Use of electronic media, including Internet and video gaming, has also increased among children with a health condition, like Attention Deficit or Hyperactivity Disorder (ADHD). The Internet environment and virtual reality offers very attractive features for them. It provides very broad content for potential stimulation or various activities in simultaneously open windows, which might lead to fixation on the online world. Furthermore, video games offer immediate rewards with a strong incentive to increase the reward by trying the next level (Weiss et al., 2011; Ko et al., 2012).

1.4 Aim of the study and research questions
The aim of this thesis is to explore active participation and perceived barriers among adolescents, especially among those with a health condition. Moreover, we aimed to analyse the influence of these barriers on health and quality of life in adolescents.

On the basis of the previous considerations the following research questions, which are graphically represented in Figure 1.2, were formulated.

**Research question 1:**
Do adolescents with long-term illness, asthma and learning disabilities differ in screen-based activities? (Chapter 3)

**Research question 2:**
Is there an association of screen-based behaviour with selected physical and psychological health complaints and is this association moderated by physical activity? (Chapter 4)

**Research question 3:**
Is the time spent on use of the Internet and computer screens associated with school difficulties and what is the role of sleep quality and unhealthy eating habits in this association? (Chapter 5)

**Research question 4:**
Do adolescents with diabetes mellitus feel barriers to active participation and do such barriers influence their active participation? (Chapter 6)

**Research question 5:**
Are family-related factors associated with excessive time spent on screen-based activities among adolescents? (Chapter 7)

1.5 Outline of this thesis
Chapter 1 provides general information and the scientific background focused on active participation and perceived barriers among adolescents, especially those with a health condition. Moreover, the purpose and the research questions are summarized here.

Chapter 2 provides information on the study samples used in this thesis. It also describes the design of those studies, measures and statistical analyses.

Chapter 3 regards differences in screen-based behaviour of adolescents by long-term illness, asthma and learning disabilities.

Chapter 4 examines the relationship between screen-based behaviour and selected health complaints in school-aged children as well as the moderating role of physical activity.

Chapter 5 focuses on the associations of Internet and computer screen time with school difficulties and the role of sleep quality and unhealthy eating habits.

Chapter 6 explores perceived barriers and their associations with active participation among adolescents with diabetes mellitus.