

**FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY OF CHILDREN AND  
ADOLESCENTS – A PARENTAL POINT OF VIEW**

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## ABSTRACT

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Inactivity is a global trend that causes high costs for societies. Even children are engaged in a sedentary lifestyle from the early age even though physical activity has many positive effects on individual's health. To increase children's physical activity level, it is important to understand factors associated with physical activity behavior. The aim of the study was to investigate from parental point of view how different factors and parental correlates are related with physical activity of children and adolescents in Finland. Specifically the aim was to find out how parental socio-demographic factors (gender, income level, residential area, education level), parental role modeling, and parental support (instrumental behavior, encouragement, modeling, support/influence) were related with the number of hobbies of the child, hours spent on organized and recreational physical activities, and whether the child was practicing individual or team sports. In addition, a correlation between parental physical activity and child's physical activity was investigated. Furthermore, an association between children's gender, age and physical activity was checked.

Data was collected with an online survey during February and March 2020. In total, 239 Finnish parents (49.8 % males, 50.2 % females) answered to the survey and gave opinions about 228 children and adolescents. Of the children, 50.4 percent were girls and 49.6 percent were boys, 18.4 percent were aged six or under, 38.6 percent were aged 7–12, and 43 percent were adolescents aged 13–19. Data was analyzed with SPSS. Respondent and children samples were described by using descriptive statistics. Normal distribution of variables was checked with Kolmogorov-Smirnov test, and based on that, nonparametric tests were used (Mann-Whitney and Kruskal-Wallis). Furthermore, Spearman rank-order correlation was used.

Results indicate that parental socio-demographic factors are related with the number of hobbies of the child, and hours that the child spend on recreational and/or organized physical activities. A positive correlation was found between father's physical activity and children's recreational physical activity, and mothers were more involved in their children's hobbies than fathers. Besides, boys were more active than girls, and activity level dropped when children moved from childhood into adolescence. When planning intervention programs to increase children's physical activity level, it is important to consider different parental correlates that are related with the physical activity behavior. For example, fathers' role in increasing physical activity cannot be underestimated.

Keywords: physical activity, children, adolescents, parental correlates

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# 1 INTRODUCTION

Inactivity and sedentary lifestyle are global trends that cause health problems for the individuals and that cause substantial costs for the societies. World Health Organization (WHO, 2010) identifies that inactivity is the fourth leading risk factor for mortality after high blood pressure, tobacco use, and high blood glucose. When physical activity levels decrease, the number of overweight adults and children increase at the same time. For example in Finland, slightly over fourth (27 %) of the 2–16-year-old boys, and almost a fifth (18 %) of the same aged girls are overweight, and eight percent of the boys and four percent of the girls are fat (Finnish Institute for health and wellbeing, 2019). In addition, only 38 percent of the 9–15-year-old Finnish children and about a fifth of the Finnish adults meet the recommended physical activity guidelines (Kokko & Martin, 2018; Husu et al., 2018).

Inactivity cause substantial costs for the public health care services. Vasankari et al. (2018) calculate the direct and indirect costs of inactivity in Finland. Direct costs are health care costs such as usage of primary and special health care services and medication, and indirect costs are productivity related costs such as loss of employment years because of premature death, sick leave days, and work disability pension. Furthermore, social exclusion costs, welfare benefits, and home care and institutionalization of the elderly are examples of indirect costs. In their study, Vasankari et al. (2018) make a rough estimation that additional costs of inactivity are around 3.2–7.5 billion euros per year in Finland. Noteworthy is that these costs are not all-inclusive. Thus, it can be argued that physical activity is rather cost-friendly way to increase public health and improve national economy.

Physical activity and sport are important for the society from another point of view as well. Especially high-level sport offers experiences, joy, excitement, and sense of togetherness for the people. In Finland, and globally as well, sport is a tool for increasing national identity. High-level sport also raises idols that are important role models for children in terms of promoting healthy and active lifestyle. Organized and high-level sport are mainly based on volunteer movement in Finland. Many parents work as a volunteer in a sport club so that children have opportunities to do sport. From monetary point of view, it is important to generate money to the grass-root level so that children have an equal chance to be physically active in a manner

that is the most suitable for them. The government should take the role of physical activity and sport seriously.

Physical activity and sport participation are key terms in this study. Hirvensalo and Lintunen (2011, p.14) define physical activity and exercise, by using the definition of Caspersen et al. (1985, pp.126–128): “...physical activity is seen as any voluntary movement produced by the skeletal muscles that result in increased energy expenditure, and exercise is described as a subcategory of physical activity which is planned, structured, and repetitive, with the intent of improving or maintaining one or more patterns of physical fitness or function.” Physical activity can be categorized by its intensity: low physical activity (LPA), moderate activity (MPA), moderate-to-vigorous activity (MVPA), and vigorous activity (VPA). Sport or exercise, on the other hand, can be labelled as moderate, moderate-to-vigorous, or vigorous activity. (Somerset & Hoare, 2018)

Research evidence of the health benefits of physical activity are indisputable. Benefits can be categorized into physical, psychological/social, and cognitive. Examples of physical benefits are decreased risk of cardiovascular diseases, type 2 diabetes, osteoporosis, and some cancers together with weight control and increased fitness. Furthermore, physical activity decreases the risk for depression, and memory disorders. (Physical activity: Current Care Guidelines 2016) In addition, positive effects on brain structure, brain functioning, cognition (Donnelly et al., 2016), and school performance are identified (Dwyer et al., 2001; Felfe et al., 2016). Furthermore, physical activity’s positive effects on sleep and recovery are noticed though the effect is bidirectional (Nédélec et al., 2015).

From individual’s and society’s point of view, it is beneficial that children are adopting a physically active lifestyle from the young age. Research evidence has found a solid association between early age physical activity and physical activity later in life. In this early age adoption parents have a big influence together with siblings and friends. Parents can behave in many ways to increase the probability for children to be physically active. They can act as role models (exercising themselves and together with a child), offer instrumental support (paying costs, offering transportation and opportunities), encourage, and improve child’s self-efficacy.

The aim of the thesis is to study, what factors are associated with children’s physical activity from parental point of view. In particular, the aim is to find out how different parental socio-

demographic factors (gender, income level, residential area, and education level), parental role modeling, and parental support (instrumental behavior, encouragement, modeling, and support/influence) are related with the number of hobbies of the child, hours spent on organized and recreational physical activities, and whether the child is practicing individual or team sports. In addition, a correlation between parental physical activity and child's physical activity is investigated. Furthermore, different socio-demographic factors of children (gender and age) and their association with physical activity is checked. Previous research evidence from this field, especially in Finland, are mainly from children's and adolescents' point of view, so this study aims to deepen the understanding by researching the area from parental point of view.

In this thesis the term *physical activity* is used when referring to any voluntary movement produced by the skeletal muscles. *Sport participation* on the other hand is used as a sub-category for physical activity, and it is used when referring to doing sports in a sport club or in other organized manner. Physical activity level is defined as in hours and time spent on organized and/or recreational physical activities on weekly basis. Socio-demographic factors of the parents are gender, education level, income level, and residential area. Children's age is categorized as follows: under school-aged children (aged 6 or under), children aged 7–12, and adolescents aged 13–19. *Children* are used as an umbrella term when referring to all the children in the study.

The structure of the thesis goes as follows: section two describes children's physical activity in more detail (benefits, barriers, and recommendations), section three presents different parental correlates and their association with children's physical activity, section four introduces the methodology, section five presents the results, and section six concludes the study.



## **2 PHYSICAL ACTIVITY OF CHILDREN**

Physical activity behavior is influenced by several factors. There are for example individual, social, and environmental factors that affect the behavior. This section describes why physical activity is important for children and adolescents, what factors and barriers affect physical activity behavior, and what are the general recommendations and guidelines of physical activity set for children.

### **2.1 The importance of physical activity**

Physical activity has many positive effects on children's and adolescents' health, wellbeing, and development in general. Research evidence has found a favorable association between objectively measured physical activity (total and by intensity), patterns of physical activity (sporadic, bouts, adherence to guidelines), and different health indicators (physical, psychological/social, cognitive) (Poitras et al., 2016). In general, the more children are physically active, the more health benefits they gain, especially if they are engaging in moderate or vigorous intensity activities (Janssen & LeBlanc, 2010). Research has identified that physical activity strengthens cardiovascular health (Strong et.al., 2005), cardiorespiratory fitness (Aires et al., 2011), and bone structure (Janz et al., 2015). In addition, physical activity helps with weight control that decreases the risk for metabolic syndrome, which itself is a risk factor for many diseases (Strong et al., 2005). Besides, a positive association between physical activity and brain structure, brain functioning, and cognition have been identified (Donnelly et al., 2016).

Physical activity has positive effects on psychological/emotional, and social development as well. There seem to be a consensus that especially sport participation is positively associated with improved psychological and social health. For instance, sport participation has been found to have a positive association with higher self-esteem, better social skills, fewer depressive symptoms, better self-confidence, and stronger feelings of competence. (Eime et al., 2013) Furthermore, sport participation develops social skills such as cooperation, assertion, responsibility, empathy, and self-control (Côté 2002, referenced by Fraser-Thomas et al. 2005),

and improves emotional and behavioral wellbeing together with perceived competence (Donaldson & Ronan, 2006). An important notion of Donaldson's and Ronan's (2006) study was that psychological benefits can be gained without feeling competent at sport. Additionally, a positive relation between physical activity and academic performance, and between sport club participation and school grades have been identified (Dwyer et al., 2001; Felfe et al., 2016).

Many studies have also focused on the association between physical activity and mental health. A consensus prevails considering the benefits of physical activity on mental health even though different research settings have produced inconsistent results (Biddle & Asare, 2011). In their meta-analysis Rodriguez-Ayllon et al. (2019) found a small but significant effect of physical activity on mental health in 6–18-year-old children and adolescents. Their results indicated that physical activity was inversely associated with psychological ill-being (depression and stress), and positively associated with psychological wellbeing (happiness, self-image, and overall satisfaction with life). Another finding of the study was that great amounts of sedentary behavior, especially high levels of screen time, was related to psychological ill-being. In addition, authors concluded that different types of physical activity may affect mental health in different ways.

Physical activity and sport participation during childhood predicts lifetime sport involvement and positive association has been identified by many researchers (Yang et al., 1999; Friedman et al., 2008; Hirvensalo & Lintunen, 2011). In a 21-year tracking study, Telama et al. (2005) discovered that physical activity from age nine to eighteen significantly predicted physical activity in adulthood. Furthermore, their results proposed that continuous physical activity at school age increased the probability of being active in adulthood. Intensive and continuous participation in physical activity and sports in general were found to be more important than participation in specific sports.

Besides gaining health benefits, adopting physically active lifestyle has other positive outcomes as well. There is some evidence that childhood physical activity has an association with higher education and income level in adulthood. Vasankari et al. (2018) discovered that childhood physical activity had a positive association with education level, precisely with higher number

of school years and higher probability for higher level of education. Besides, authors discovered that childhood physical activity had a positive association with employment (i.e. lesser periods of unemployment), and higher income level. Hyytinen and Lahtonen (2013) found similar kind of association. They studied Finnish male twins and discovered that long-term income level of physically active males was 14–17 percent higher than income level of inactive males. Besides, there is some evidence that sport participation decreases the duration of unemployment periods (Cabane, 2014).

Physical activity and sport participation have also some negative outcomes that need to be considered because they affect physical activity drop-out. For example, Fraser-Thomas et al. (2005) classified that injuries and eating disorders are examples of negative physical outcomes. Athletic burnout and feelings of pressure to win are examples of emotional/psychological outcomes whereas violence, aggression and poor sportsmanship are examples of social outcomes. According to authors, it is important to understand what factors contribute to these positive and negative experiences so that negative outcomes could be avoided. Fraser-Thomas et al. (2005) identified two contributors, that either hinder or enhance positive youth development in sport: program design and adult influences.

Fraser-Thomas et al. (2005) stated that, when talking about program design, it is important to understand different stages of sport involvement; sampling years (ages 6–12), specializing years (ages 13–15), and investment years (ages 16+). During these different stages, it is important to foster proper structures, and amount of play and practice so that children do not quit exercising. Authors stated that for example during sampling years, it is important to offer different experiences from many different sports whereas during specializing years it is good to narrow down the sport disciplines to some. During investment years, children are focused on in one specific sport. Fraser-Thomas et al. (2005) remarked that if children specialize too early (versus early diversification), negative outcomes such as overtraining, injuries, decreased motivation, burnout, sense of failure, missed social opportunities, increased sensitivity to stress, and overall dropout of sport may occur.

Second contributor to positive youth development by Fraser-Thomas et al. (2005) is adult influences. To foster positive development, children need to have long-term mutual relationships with others such as parents, peers, and coaches. Authors mentioned that positive interaction, support, and encouragement from parents have been positively associated with feeling more enjoyment, having more intrinsic motivation, showing more preference for challenge, and overall having greater attraction for sport and in that way leading to higher levels of sport participation, whereas less support, criticisms, and high expectations were linked to dropout and burnout. Besides, authors stated that coaches have also big influence on youth development. Less encouraging, less supportive, controlling, and autocratic coaches were associated with dropout whereas being supportive, offering reinforcement and emphasizing athlete development rather than winning have been associated with attainment of sport and positive feelings towards sport.

## **2.2 Factors, motives, and barriers of physical activity**

Factors that are associated with physical activity can be classified into five categories based on the social-ecological framework: demographic/biological (e.g. age, gender, and ethnicity), psychological/cognitive/emotional (e.g. goal orientation and intention), behavioral (e.g. participation on a sport team, and sedentary time), social/cultural (e.g. parent role modelling and support from parents/siblings/peers/coaches/teachers), and environmental (e.g. opportunities to be physically active) (Sallis et al., 2000; Gustafson & Rhodes, 2006; Biddle et al., 2011).

Different biological factors affect children's physical activity. There exists a common understanding that boys are more active than girls, and that physical activity levels drop when children get older, especially when they are moving from childhood into adolescence (Sallis et al. 2000; Biddle et al., 2011; Mitchell et al., 2016; Bakalár et al., 2019). Besides, there is some evidence that ethnicity is affecting physical activity; 'white Caucasian' adolescents are more likely to be active than other ethnic groups. Furthermore, body mass index (BMI) is found to be inconsistently related to physical activity; a small negative correlation is found among adolescent girls. (Biddle et al., 2011) Physical activity behavior of the Finnish children and

adolescents -study (2018) supported these views since physical activity levels as well as sport club participation dropped when children moved from childhood into adolescence.

Furthermore, socio-economic status (SES) also affects children's physical activity; high SES is linked with higher participation rate (Seabra et al., 2011). Socio-economic status may affect physical activity levels because of how parents show support for their children. Brockman et al. (2009) found that children from middle/high-SES families were supported by logistical and financial support, co-participation, and modelling whereas children from low-SES families were supported more by verbal encouragement and demand. In addition, middle/high-SES children engaged more in organized sports while low-SES children engaged more in unstructured and "free play" activities. One of the most significant barriers for low-SES children, that Brockman et al. (2009) found, were costs. Related to these results, Telford et al. (2016) found that girls who were in the lower section of SES were less active and fit, and participated less in sport club activities as their high-SES counterparts.

A review made by Biddle et al. (2011) investigated different psychological correlates that are associated with physical activity. They found that higher levels of perceived competence were associated with physical activity especially among adolescents. However, the strength of this association might be dependent on a sex of a child. Besides, authors concluded that achievement orientation was positively associated with adolescents' physical activity. An interesting finding was also that self-efficacy/confidence and enjoyment were inconsistently associated with physical activity. Some studies, that Biddle et al. (2011) surveyed, identified a positive association between self-efficacy and enjoyment among adolescent girls whereas some other studies did not find any association among children and adolescents. Furthermore, Biddle et al. (2011) discovered that body image and appearance were important factors affecting adolescent girls' physical activity.

Previous research has identified different motives why children participate and commit in physical activities. These motives can be categorized into intrinsic, social, and outcome related factors (McCarthy et al., 2008). Intrinsic factors are for example feelings of excitement, having fun, feeling personal accomplishment, and improving one's skills. Social factors include being

with friends, and outcome related factors include for instance winning the game and pleasing others. Motives may differ depending on gender and age of a child and whether a child is engaging in team or individual sports. For example, McCarthy et al. (2008) found that older children, boys, and children who engaged in team sports reported greater enjoyment than younger children, females, and children who engaged in individual sports. Enjoyment has been found to be crucial factor for sport commitment and it is influenced by different intrinsic, social, and outcome related factors. For example, Weiss et al. (2001) compared two different models. In the first model different factors such as enjoyment, personal investments, and social support affected directly on sport commitment whereas in the second model different factors affected enjoyment which worked as a mediating factor for sport commitment.

When talking about behavioral variables, Biddle et al. (2011) found that previous physical activity is a consistent predictor of physical activity, and that sedentary behavior's association with physical activity seem to be small. In addition, Telford et al. (2016) investigated the influence of sport club participation on physical activity, fitness, and body fat during childhood and adolescence in Australia. Overall, their findings suggested that children who participated in sport club activities were more physically active on daily basis, their fitness was higher, and they spent less time in sedentary activities than children who participated less. The research also discovered that participation rate for sport club activities was higher for boys than for girls. In addition, they found that sport club participation rate dropped from age twelve to sixteen, and greater levels of physical activity dropped during adolescence, especially among girls.

There are elements in the physical, built environment that can either enhance or hinder physical activities. Built environment consist of neighborhoods, roads, buildings, and recreational facilities. In some places physical activities are encouraged when in other places physical activity is discouraged or even prohibited. (Sallis & Glanz, 2006) For example, unsafe environment, meaning risk of harm from strangers, risk of personal injury, unsafe roads, and risk for bullying decreases the level of physical activity (Carver et al. 2008). Enhancing factor in physical environment is that there are enough possibilities and facilities nearby that are easily accessible either by walking/cycling or with public transport (Sallis & Glanz, 2006; Bower et al., 2008; Mitchell et al., 2016). In addition to physical environment, climate conditions matter;

some children may perform better in summertime whereas some in wintertime (Augste & Künzell, 2014).

When planning and building physical environments, green areas should be included in the plan. A study made by Thompson Koon et al. (2011) investigated the difference between doing physical activities outdoors and doing physical activities indoors. They discovered that doing physical activities outdoors produced more enjoyment and satisfaction compared to doing physical activities indoors. Besides, they concluded that outdoor environment was associated with greater feelings of revitalization, decreased tension, anger, confusion, and depression, however these results were somewhat limited. Furthermore, Biddle et al. (2011) found in their review that time spent outdoors, accessibility, physical activity opportunities, and availability seemed to be positively associated with physical activity.

Sallis et al. (2000) reviewed 40 to 48 different variables and their association to children's and adolescents' physical activity. Particularly, a comparison between 4–12-year-old children, and 13–18-year-old adolescents was made. In the children's group, a positive relation was found between physical activity and gender (male), parental overweight status, physical activity preferences, intentions to be active, previous physical activity, healthy diet, program/facility access, and time spent outdoors. A negative correlation was found between physical activity and presumed barriers. In adolescents' group, a positive relation was found between physical activity and gender (male), ethnicity (white), achievement orientation, perceived competence, intentions to be active, previous physical activity, sensation seeking, community sports, sibling's physical activity, parental support, support from others, direct help from parents, and opportunities to exercise. A negative correlation was found between physical activity and age, depression, and being sedentary after school and on weekends. The most frequent and consistent result in both groups was that boys were more active than girls.

There are barriers that prevent children and adolescents from being physically active. In their review, Somerset, and Hoare (2018) classified barriers as practical barriers or person-centered barriers (external and internal). According to them, the most common practical barriers were costs of sport activities, lack of time, and location of activities. In addition, they found that the

most dominant person-centered external barriers were peer disapproval, stereotyping, and lack of parental support whereas common person-centered internal barriers were sporting ability (i.e. how one feels about their sporting abilities), fear of judgement, and competition. Besides, Finger et al. (2014) identified a high BMI of a child, low physical wellbeing, and low parental support for leisure time activity as barriers for engaging in physical activities, especially among adolescents whose parents had low socio-economic position. Biddle et al. (2011) stated that barriers are either real or perceived. They identified the main barriers as perceived lack of time, other activities (e.g. homework), lack of interest or motivation, and the effort needed.

There seems to be a difference between children from lower and higher sociodemographic groups on how they perceive barriers for sport participation. Casper et al. (2011) concluded that children from lower sociodemographic groups perceive more barriers than their counterparts from higher sociodemographic groups. Besides, they found time, peer influence and accessibility of facilities to be the third most perceived barriers of sport participation. Furthermore, children who did not participate on any kind of sport activity perceived more barriers than children who engaged in sport activities. Also, girls seemed to perceive more barriers than boys.

### **2.3 Physical activity recommendations for children and adolescents**

World Health Organization (WHO) has outlined recommendations of physical activity for 5–17-year-old children and adolescents (Global recommendations on physical activity for health, 2010). In the recommendations, physical activity is defined as any planned or spontaneous activity such as play, games, sports, transportation or chores in the family, school, or community context. Recommendations are based on scientific evidence of the benefits of physical activity for health, and they are the following: moderate-to-vigorous intensity physical activity at least sixty minutes daily, and activities that strengthen muscles and bones at least three times a week (for example weight training or vigorous aerobic exercise). Aerobic activities should be favored daily, and daily dose of 60 minutes can be accumulated in multiple shorter bouts. WHO has also made Guidelines on physical activity, sedentary behavior and



sleep for children under five years of age (2019) that contains specific recommendations for infants (less than one year old), children aged 1–2, and 3–4 years-old.

In Finland, UKK Institute has provided recommendations that follow WHO's guidelines: Recommendations for the physical activity of school-aged children (2008). The last modification has been made in 2008 but the recommendations will be renewed in 2020 (UKK Institute, 2020). Besides, Finland has been among the first countries to recognize the benefits of sport for the development of younger children by publishing national guidelines for under school aged children (Joy, play and doing together – Recommendations for physical activity in early childhood, 2016). According to the Recommendations for the physical activity of school-aged children (2008), the basic recommendation is that children should be physically active at least one to two hours daily. Ways of being active should be versatile and suitable for each age group. Sedentary behavior more than two hours at a time should be avoided together with reducing screen time to two hours a day. The basic recommendation for under school aged children is minimum of three hours a day. Daily activity should contain versatile activities with different intensities, and sedentary behavior for over one hour at a time should be avoided.

## **2.4 Activity level of Finnish children**

Studies are made to investigate how Finnish children meet with the recommended guidelines. According to Physical activity behavior of the Finnish children and adolescents -study (2018) approximately 38 percent of the 7–15-year-old children meet the recommended physical activity guideline, an hour per day. About 50 percent of the 7–11-year-old children meet the guideline whereas only 20 percent of the 15–year-olds meet the guideline. Approximately one sixth engage in little or no physical activity during the week (0–2 days a week). Overall, the results reveal that younger children and boys meet the guideline more often than older children and girls, and that physical activity decrease, and inactivity increase when children get older.

Other findings of the Physical activity behavior of the Finnish children and adolescents -study (2018) reveal that among boys, physical activity starts to decrease at the age of eleven whereas among girls physical activity level is quite stable until the age of thirteen when decreasing

starts. About two thirds of the children meet the recommendation of vigorous activity (at least three times a week); younger children meet this recommendation more often than older children. The study also shows, how much time children and adolescents spend being inactive per day. According to the results, children and adolescents spend about 50 percent of the awakening time being inactive, meaning laying down or sitting down. This percentage seems to increase when moving from younger age groups to older ones, and at the same time, time spend on moderate-to-vigorous, and vigorous activities decrease. (Kokko & Martin, 2018)

In addition, the study discovered that the most common way of being physically active is spontaneous, independent activity. About 91 percent of the children are spontaneously active at least once a week. This percentage decrease when children get older, for example 20 percent of the 15-year-old adolescents are not being spontaneously active at all or are active very rarely. When active, children and adolescents seem to participate in light activities, especially girls. Boys do more moderate-to-vigorous, and vigorous activities in every age group compared to girls. About 62 percent of 9–15-year-old children are participating in organized sports. The most common age group participating in organized sports is 11-year-old whereas 15-year-old adolescents are participating the least. Younger children and boys are participating on sport club activities more than older children and girls. Two thirds have belonged to sport club before school age, and one fourth had ended a sport club hobby. In addition, those children and adolescents who meet the national guidelines participate more on activities organized by sport clubs or private companies. Besides, children and adolescents who live in cities are more actively involved in sport club activities as to those counterparts who live in a countryside. (Kokko & Martin, 2018)

As a conclusion it can be said that research evidence of the benefits of physical activity for children is indisputable. However, children are not active enough, since majority of the children are not meeting the recommendations set for them, not even the minimum level. Motives and barriers for participating might be gender or age related, and these should be taken into account when planning actions. In the next section parental correlates and their association to children's physical activity are discussed in more detail.

### **3 PARENTAL CORRELATES AND CHILDREN'S PHYSICAL ACTIVITY**

This section describes, how different parental correlates are associated with physical activity of children and adolescents. Different correlates can be categorized into socio-demographic factors, role modelling, and parental support. Research considering parental correlates has produced mixed results mainly because researchers have used cross-sectional data whereas evidence from longitudinal studies is limited. Besides data used, methods, age groupings and measures of physical activity have differed between studies. However, many reviews and meta-analysis considering the issue have been made (Edwardson & Gorely, 2010; Pugliese & Tinsley, 2007) to understand what kind of parental influence is in association with children's and adolescent's physical activity and sport participation. Next, a short introduction to different correlates and their association to children's physical activity is made.

#### **3.1 Socio-demographic factors**

Previous studies have investigated different socio-demographic factors such as gender, age, education, income level, ethnicity, and residential area, and their association to physical activity. A term parental socio-economic position (PSEP) or socio-economic status (SES) has been widely used as an umbrella term to combine these factors, and many studies have investigated especially the relationship between SES and physical activity (Finger et.al 2014; Biddle et al., 2011). Many studies have also focused solely on whether gender of the parent affects physical activity of children. For example, Gustafson and Rhodes (2006) found that there is some evidence of the positive correlation between same gender parent and same gender child, however, results are little contradictory.

A study made by Mutz & Albrecht (2017) examined the relationship between parents' socio-economic (SES) status and children's moderate-to-vigorous physical activity (MVPA) patterns on daily basis. They discovered that the socio-economic status of parents, specifically education background and income level, predicted children's daily MVPA levels. However, child's gender was found to be a strong predictor of MVPA meaning that boys were more active than girls, and this was independent of parents' SES. Partly different results were found from a study

made by Lämmle et al. (2012). They found an association between SES (education, occupation, and income level) and physical activity of adolescents; adolescents in lower SES were less active than children in higher SES, and this association was applicable in both males and females. In relation to this finding, Freitas et al. (2007) discovered that physical fitness of children differed between high, average, and low SES groups, however these differences were related to sex and age of a child. Furthermore, Toftegaard-Støckel et al. (2011) found that adolescents whose one parent or both parents were unemployed were less likely to participate in organized sports.

A German study made by Finger et al. (2014), found that higher level of parental education was positively associated with better aerobic fitness and lower media use of 11–17-year-old adolescents. Besides, higher education level of the parent was associated with higher leisure time physical activity, better aerobic fitness, higher total energy expenditure, and less media use, but only among girls. Similar kind of results were found in a study made by Jiménez-Pavón et al. (2012). They studied the association between parental education and children's physical activity across Europe. Results revealed that parental education level influenced children's PA, but the results were gender- and country-specific.

Parental status and its effects on physical activity of children have been studied less. Some studies have found that children from single parent families were more active than other children, whereas others have found that if there is one active parent in the family, children are more likely to be active than families where there are two active parents or no active parents at all (Gustafson & Rhodes, 2006). Biddle et al. (2011) reviewed that single parent status is unrelated to physical activity level of children, whereas Toftegaard-Støckel et al. (2011) found that adolescents from single-parent homes were less likely to participate in organized sports, especially if the their parents were not physically active themselves.

### **3.2 Parent's own physical activity level**

A term 'parental modelling' has been widely used and its influence on children's physical activity has been studied. However, evidence of the influence has been inconsistent. This may

be because of many studies of physical activity have been based on self-reports rather than objectively measured activity levels (Moore et al., 1991), some have used interviews or questionnaires that have not been validated previously, and study settings have been in most parts cross-sectional rather than longitudinal (Gustafson & Rhodes, 2006). Besides, Sallis et al. (2000) mentioned that lack of consistency between studies is based on methodological problems, especially differences in measurement and samples used. Another explaining factor could be that many studies have focused on direct modelling and lacked focus on other constructs such as parental beliefs about physical activity, encouragement, and parental support (Trost et al., 2003). Even though the research evidence is mixed, there is still a shared presumption that active parents have active children (Biddle et al., 2011).

Schoeppe et al. (2016) investigated how maternal and paternal sport participation was associated with 10–13-year-old children's leisure time physical activity in Germany. They found that higher parental sport participation was related to higher leisure-time physical activity levels of children. Particularly, they discovered that higher maternal sport participation was positively and significantly associated with higher physical activity levels of girls whereas higher paternal sport participation was positively and significantly associated with higher physical activity levels of boys (i.e. the association was stronger among parent-child pairs of the same gender). Overall, they concluded that the higher parental sport participation was, the higher children's leisure time physical activity level was. Gustafson and Rhodes (2006) found a similar association in their review when they studied overall physical activity.

Stearns et al. (2016) studied objectively measured activity of both parents and children aged 7–8. They found a positive correlation between parents' steps taken per day and children's steps taken per day. Specifically, when parents' steps increased by 1000 steps a day, children's steps increased by 260 steps a day. Besides, they also investigated how different parental correlates affected this correlation. They discovered that the correlation was stronger among those parent-child pairs where parents had higher education and higher income level. However, this result was not statistically significant but being close to statistical significance.

An association between father's physical activity and adolescents' physical activity has been proven by Bakalár et al. (2019). They found that adolescents aged 13–16, who had active fathers were 1.3 times more likely to report higher levels of moderate-to-vigorous physical activity levels (MVPA) than adolescents who had inactive fathers. Besides, those adolescents who played sports together with their parents at least once a week reported higher levels of MVPA than those who did not play. On the contrary to these findings Seabra et al. (2011) found that father's physical activity was not a predictive factor for adolescents' participation of high-level PA, but mother's activity was. Parallel findings were found from a meta-analysis made by Yao and Rhodes (2015). They discovered that an association between father-son PA was higher than mother-son PA. In addition, they found that parent's gender did not affect girls' PA. Overall they discovered a small association between parental PA and child PA.

Similar results were found in studies made by Moore et al. (1991), and Jago et.al. (2014). Moore et al. (1991) studied the association between objectively measured physical activity of parents and 4–7-year-old children. They found that those children, who had active mothers, were two times more likely be active than children who had inactive mothers. In addition, those children who had active fathers were 3.5 times more likely to be active than children who had inactive fathers. Besides, they found that when both parents were active, the probability of the children being active rose six-fold. Jago et al. (2014) got similar way of results when objectively measured MVPA of parents and 5–6-year-old children were investigated. They found a weak association between parents and children; however, they did not find differences between boys and girls indicating that the association between parental physical activity and child physical activity was similar for boys and girls. Another study made by Garriguet et al. (2017) discovered that objectively measured MVPA of parents was associated with MVPA of Canadian children aged 6–11. Specifically, there was stronger correlation between a parent and a daughter versus a parent and a son (except on weekdays after school).

Trots et al. (2003) investigated how parental physical activity influenced children's physical activity. They found that parental physical activity did not influence children's physical activity directly but instead parental physical activity behavior, parental enjoyment of physical activity, and perceived importance of physical activity were positively associated with parental support, which in turn mediated the physical activity behavior of a child through self-efficacy

perceptions. Their important notion was that instrumental parental support, such as transportation, encouragement, and observing child's activity, were important in boosting child's self-efficacy and confidence and in that way increasing child's physical activity level. They concluded that direct role modeling is insufficient in influencing children's physical activity itself.

Research field have gotten mixed results of the correlation between different parental correlates and physical activity of children and adolescents. Many studies have found no relation to physical activity, which is why there is a need for more longitudinal studies. Some have already been made, for example Yang et al. (1996) discovered that father's physical activity was positively associated with the overall physical activity of both girls and boys. In addition, they discovered, that mother's physical activity had a small but significant association to girl's physical activity but not for boys. The mechanisms that can explain the relationship between parents' and children's physical activity according to Moore et al. (1991) could be role modeling, sharing of activities by family members, enhancement, and support by active parents. Trots et al. (2003, 277) referencing Baranowski (1997) listed additional mechanisms such as genetics, rewarding desirable behavior, punishing undesirable behavior, eliminating barriers, providing resources, and helping the child develop self-control skills. A contrasting notion made by Aarnio et al. (1997) was that the association between parental physical activity and child's physical activity could also be reverse meaning that physically active child could influence parent's physical activity level especially if the parent has been inactive.

### **3.3 Parental support**

There are many ways how parents can influence children's and adolescents' physical activity, sport participation, beliefs about themselves, and their capabilities. Parental support means different behavior related to children's physical activity such as role modelling, encouragement, and instrumental support (for example paying the costs, or offering transportation). Eccles' and Fredricks' (2005) categorization indicate that parents can act as role-models (e.g. by being coaches or participating in sport themselves), they can interpret and give messages about children's sporting abilities and the value of practicing sports. Parents also provide emotional

support and positive experiences related to sports. Parental support has been proven to influence children's physical activity, both in the early years (Carson, 2016), and during adolescence (Biddle et al., 2011) however the effect of overall parental support might be small or moderate (Yao and Rhodes, 2015). In their meta-analysis, Yao and Rhodes (2015) stated, that a moderate effect was found between encouragement and child's physical activity, and a small effect between a child's PA and praising the child, watching the child participate in PA, engaging in parent-child co-activity, transporting the child to places where the child could be active, and providing the child with equipment.

Parental support has been widely associated with children's physical activity, however, correlation's effect, direct or indirect, is not fully clear. Direct correlation means that child's activity level increases because of parent's activity level and indirect correlation means that parental support affects for example child's self-efficacy which in turn increases child's physical activity level. (Gustafson & Rhodes, 2006) Brown et al. (2017) found in their longitudinal study that greater social support from parents (e.g. co-participation, facilitation, and encouragement) was related to greater odds at meeting with the physical activity guidelines. Related to this finding, Gustafson, and Rhodes (2006) found that boys received more overall support than girls, and that boys were more encouraged than girls. Furthermore, Eccles and Fredricks (2005) indicated that parents perceived their sons had more athletic ability, and that sport was more important for boys than for girls. They also stated that parents were stereotyped in their actions providing more opportunities and encouragement for their sons.

In their meta-analysis, Pugliese and Tinsley (2007) investigated the relation between parental behavior and child and adolescent leisure time physical activity (PA). Parental behavior was outlined in five different categories: encouragement (e.g. promoting physical activities), modeling (e.g. parents' own activity and sedentary behavior levels), instrumental behavior (e.g. offering transportation and buying equipment), work habits, and support-/ influence (e.g. emotional support for physical activity). After conducting the meta-analysis, they found a small positive, statistically significant relation between parental behavior and children's PA (both children and adolescents). Modeling had the weakest relation to PA whereas encouragement and instrumental behavior were found to be significantly related to physical activity of children, both children and adolescents.



Pugliese's and Tinsley's (2007) findings related to the relative risk of children being inactive were interesting. Those children, whose parents were not engaged in socialization behaviors, had 1.41 times greater risk for being inactive than those children whose parents engaged in socialization behavior. In addition, the relative risk for inactivity was 1.86 times greater if the parents were not encouraging, and 1.59 times greater if the parents did not engage in instrumental behavior. The odds for being an active child/adolescent were over two times higher if the parents were encouraging and engaged in instrumental behavior. Another study made by Garriguet et al. (2017) discovered a similar relation between parent's sedentary behavior and child's sedentary behavior. More specifically, an association was discovered between parents and daughters on weekends, and between parents and sons during weekdays (after school period).

Parental influence on child's physical activity can have different influence depending on the age of a child, gender of a child, types of intensity levels, and types of parental correlates. For example, when considering children aged 6–11, Edwardson & Gorely (2010) found in their review that mother role modelling was positively associated with children's moderate-to-vigorous physical activity (MVPA). In addition, they discovered that parental involvement was positively associated with overall physical activity of children, father modelling and father involvement was positively associated with leisure-time physical activity, and overall support was positively associated with organized physical activity. In addition, Edwardson & Gorely (2010) studied correlates related to adolescents' activity (aged 12–18). They found that parental modelling (both mother's and father's physical activity), parental support, parents' attitudes/beliefs, and transport were positively associated with MVPA. Besides, father's physical activity, and support were positively associated with overall physical activity and vigorous physical activity (VPA) of adolescents.

Davison et al. (2006) found that parental support had a positive association with girls' (mean age 9.3) organized sport whereas Fogelholm et al. (1999) discovered a positive association between father modelling and girls' (aged 6-11) VPA. This same study by Fogelholm et al. (1999) discovered also that mother modelling was positively associated with both girls' and boys' overall physical activity, but father modelling applied only for girls. In addition, Bauer et al. (2008) discovered that especially parental encouragement was associated with higher levels

of MVPA, particularly adolescents who were influenced by their same-sex parent. A longitudinal study made by Sallis et al. (1999) found that parental encouragement, playing with a child, transport, parent physical activity, and fees payed were positively associated with boys' overall physical activity but not for girls. On the contrary, Barnett et al. (2002) discovered that parent modelling and encouragement did not have a relation with overall physical activity of both boys and girls.

### **3.4 Other factors**

Siblings, peers, physical education teachers and other significant persons also influence children's and adolescents' physical activity level as well as other domains in life. Influence is based on social learning; observational learning and imitation (Whiteman et al., 2007). There is some evidence that peer and sibling modeling/influence is stronger among adolescents than among younger children, whereas parents have stronger influence on younger children's physical activity and sedentary behavior (Yao & Rhodes, 2015; Matarma, 2020). For example, Yao and Rhodes (2015) stated that parental modeling is important in the early years because during those early years, child adopts social norms related to physical activity. But when child matures the influences of physical activity comes more from peers.

Peer influence and its relation to physical activity of children and adolescents have been widely studied. Bakalàr et al. (2019) found that best friend's influence on sufficient level of moderate-to-vigorous physical activity was stronger among boys compared to girls, and Seabra et.al. (2011) found that peers had a positive influence on adolescents' (aged 10–18) moderate and high levels of PA for both girls and boys. A review made by Macdonald-Wallis et al. (2012) found a strong evidence of how friends influence physical activity of children and adolescents. In particular, they discovered that friends' physical activity predicted individual's physical activity, and that children were more likely to form ties with other children who had similar physical activity behavior with the individual. Besides, individuals' perceptions of peer support have been found to be positively related to children's physical activity (Wilk et al., 2018).

Fitzgerald et al. (2012) found that peers and friends were important when talking about physical activity of adolescents. They identified six processes, how peers and friends influenced the behavior. These were peer and/or friend support, presence of peers and friends, peer norms, friendship quality and acceptance, peer crowds, and peer victimization. Especially they proposed that influence of peers and friends might be especially important for those adolescents who are at risk of being overweight. Specifically, overweight youth might involve in more intense physical activities when friends are around compared to doing physical activities alone. Researchers also found that friendship quality and peer acceptance enhance the feeling of connectedness and in that way affected sport continuation, perceived self-competence, and enjoyment of PA.

Kracht and Sisson (2018) reviewed studies made of the sibling influence and discovered that children who had siblings had higher levels of MVPA than children with no siblings. Besides, children without siblings were more likely to be obese than children with siblings. In relation to these findings, Liu et al. (2014) found that older sibling's influence on younger sibling's physical activity was stronger than parent's level of activity. Furthermore, Whiteman et al. (2007) found a relation between older sibling's sport interest and younger sibling's sport interest. This relation was evident especially between younger sisters and older brothers and sisters who showed great interest in sports.

As a conclusion one could say that parental correlates have an influence on child's physical activity level. However, age of a child, gender of a child, and gender of a parent affect this influence. In addition, it is not fully clear whether parents influence children's physical activity directly or indirectly. Next section describes the study procedure, and after that study results will be presented.

## **4 RESEARCH QUESTIONS AND METHODOLOGY**

This section describes the data collection procedure, and methods of statistical analysis. The aim of the research was to investigate, what factors are associated with children's and adolescents' physical activity from parental point of view. In more detail, the aim was to investigate different parental correlates, such as socio-demographic factors, physical activity level (parental modeling), and parental support, and their association with children's physical activity.

Research questions of the study are the following:

1. How do parents' socio-demographic factors relate with the physical activity level of the child?  
H1: Socio-demographic factors relate with the number of child's sport hobbies  
H2: Socio-demographic factors relate with the number of hours that the child spends at organized and recreational physical activities  
H3: Socio-demographic factors relate with whether a child is engaging in team sports or individual sports
2. How do parents involve in their children's sport hobbies?  
H4: Socio-demographic factors relate with the level of parental support
3. How does parent's physical activity level correlate with child's physical activity level?  
H5: There is a positive correlation between parent's own physical activity level and child's physical activity level
4. How do age and gender of the child relate with child's own physical activity level?  
H6: Boys are more active than girls  
H7: Activity level decreases with age

Data was collected as a part of a research project of Sponsor Insight Finland, which is a company specializing in planning and measuring sponsorship activations as well as executing event and market surveys (Sponsor Insight Finland, 2020). Sponsor Insight Finland works closely with sponsoring companies and rightsholders from the fields of sport, culture, and events. Within sport sector, the company collaborates with different sport clubs, sport associations, and sport events. I have had the privilege to work in Sport Insight Finland since 2018. Because the data was collected as a part of the company's project, the data is owned by Sponsor Insight Finland.

The questionnaire was created, and the data was collected with the help of Klaus Virkkunen, Research Director of Sponsor Insight Finland. Data was collected through an online panel operated by Dynata, one of the world's largest provider of first-party data and insight (Dynata, 2020). Quantitative methods were chosen and IBM SPSS Statistics 26 together with Microsoft Office Excel were used for the data analysis.

#### **4.1 Data collection procedure**

An online questionnaire was created, and it was made only in Finnish because of study's target group. The questionnaire contained 29 closed-ended questions. All the questions were optional so the respondent could have chosen not to answer or give an opinion. Questions, question paths, and coding for SPSS were made together with the Research Director of the company. The data was collected during February and March 2020. Response time varied between 5–12 minutes, and average drop-out rate was 15 percent. The questionnaire is found in the Appendix 1.

Dynata's online panel was used to target Finnish adult population (minimum age of 18) so that a sample as broad as possible could be collected. More specifically, the aim was to broadly target Finnish adults, who had at least one child participating in physical activities whether in organized or recreational physical activities. There are about 100.000 over 18-year-old Finns in Dynata's online panel pool from which a thousand respondents were randomly selected to participate this survey. Respondents in the panel choose to participate voluntarily and therefore

they could quit participating in the research at any time. Respondents were anonymous, which is important from the ethical point of view of the research. No individuals could be identified from the answers. There was a filtering question in the study, which was “Do you have at least one under 20-year-old child participating in physical activities?”. If the respondent did not have children, they did not get questions related to children’s physical activities, and they were not included in the study. If the respondent had multiple children, they were asked to give an opinion considering only the oldest and the second oldest child. Overall, 239 respondents met the filtering question criteria and were included in the study.

## **4.2 Methods of statistical analysis**

After the data was collected, it was coded and entered SPSS. When the data was successfully entered, descriptive statistics such as frequencies and percentages were used to describe the sample and variable distribution in more detail. Cross-tabulation was used to describe the variable distribution and differences between groups (mainly gender and age distribution), and Chi-square test was used to statistically analyze differences between genders and age groups. Normal distribution assumption was checked with Kolmogorov-Smirnov test, and based on that, non-parametric tests were chosen. Means between two separate groups were compared with Mann-Whitney U-test and means between multiple groups were compared with Kruskal-Wallis test. Correlations were calculated with Spearman rank-order correlation, which is independent of the variable distribution. Level of statistical significance was based on  $p < 0.05$  level.

## **5 RESULTS**

This section presents the main findings of the study. First, descriptive statistics of the respondents and children participating in physical activities are illustrated with frequencies and cross-tabulation. After that, results of nonparametric tests and Spearman rank-order correlation are presented. Finally, a conclusion will be drawn.

### **5.1 Descriptive statistics**

Next, respondent details are presented in more detail. After that details considering children who participate in some form of physical activities are illustrated.

#### **5.1.1 Respondent details**

Total of 239 Finnish parents answered the online survey. From these, 50.2 percent (N=120) were women and 49.8 percent (N=119) were men. Majority (46.4 %) were aged between 30–44, 33.9 % aged 45–59, 17.2 % aged 18–29, and the rest (2.5 %) 60 years or over. Of the respondents 41 percent were living in a large town or its sphere of influence with over 100.000 inhabitants, and 33.5 % in a small or averaged sized town or municipality with 20.000 – 100.000 inhabitants. The rest (25.5 %) were living in a countryside. A fourth of the respondents had university education, and 16.9 percent had education from the university of applied sciences. Majority (36.9 %) had vocational school education and the rest (21.2 %) had either comprehensive school education or upper secondary level education. Income levels were distributed. Details are presented in Tables 1, 2, and 3. Note that Tables do not include those respondents who did not want to give an opinion.

TABLE 1. Resident area of the parent

	Frequency	Valid Percent	Cumulative Percent
Large town or its sphere of influence (over 100.000 inhabitants)	98	41,0	41,0
Small or medium sized town / municipality (20.000 – 100.000 inhabitants)	80	33,5	74,5
Countryside / Sparsely populated area	61	25,5	100,0
Total	239	100,0	

TABLE 2. Education of the parent

	Frequency	Valid Percent	Cumulative Percent
Comprehensive school	19	8,1	8,1
Upper secondary school	31	13,1	21,2
Vocational school	87	36,9	58,1
University of applied sciences	40	16,9	75,0
University	59	25,0	100,0
Total	236		

TABLE 3. Income level of the family (yearly gross income)

	Frequency	Valid Percent	Cumulative Percent
Under 30.000 euros	67	31,2	31,2
30.001 – 60.000 euros	97	45,1	76,3
Over 70.000 euros	51	23,7	100,0
Total	215		



When asked, how many under 20-year-old children the respondent had, 46.4 percent had one child, 39.3 percent had two children, and 14.2 percent had three or more. Furthermore, a parental status was asked, and details are presented in Table 4. As a notion, joint custody in this study means that parents are divorced, and they are sharing the custody.

TABLE 4. Parental status

	Frequency	Valid Percent	Cumulative Percent
Both parents are living with the child/children	134	60,4	60,4
Joint custody	66	29,7	90,1
Single parent	22	9,9	100,0
Total	222		

Respondents were also asked to evaluate their own physical activity level. There were two different questions about the activity level; how many times you are physically active per week and how many hours you are physically active per week, whether in organized or recreational manner. It is noteworthy to highlight that 15.9 percent of the parents did not exercise at all on a weekly basis. Majority (60.6 %) were physically active 1–4 hours per week. Some parents were highly active since ten percent did physical activities 8–10 hours or more on a weekly basis. Tables 5 and 6 illustrate the details.

TABLE 5. Activity level (times per week)

Times	Frequency	Valid Percent	Cumulative Percent
0	39	16,3	16,3
1-2	80	33,5	49,8
3-4	65	27,2	77,0
5-7	38	15,9	92,9
8-10	7	2,9	95,8
Over 10	10	4,2	100,0
Total	239	100,0	

TABLE 6. Activity level (hours per week)

Hours	Frequency	Valid Percent	Cumulative Percent
0	38	15,9	15,9
1-2	78	32,6	48,5
3-4	67	28,0	76,6
5-7	32	13,4	90,0
8-10	12	5,0	95,0
Over 10	12	5,0	100,0
Total	239	100,0	

Furthermore, respondents were asked to give an opinion in which sport disciplines they participate currently or had participated in the past. Respondents could choose in between 33 different options and they could choose all the sport disciplines they had done. Table 7 presents the results by gender of a parent. Total column represents the amount of mentions for a specific sport discipline. It can be viewed from Table 7 that the top ten most practiced sport disciplines among parents were: walking, gym/fitness, swimming, cycling, running, football, floorball, track & field, group lessons at the gym, and cross-country skiing. Only two team sports disciplines, football, and floorball were included in the top ten. In addition, males practiced more team sports than females, and 11.7 percent of the parents did not participate in any form of physical activities. Because the list was given and contained closed ended questions, no detailed information about “other” discipline was available.

TABLE 7. Sport disciplines practiced by parents

	Men	Women	Total
1. Walking	37	55	92
2. Gym / Fitness	26	33	59
3. Swimming	27	29	56
4. Cycling	27	29	56
5. Running	28	27	55
6. Football	42	12	54
7. Floorball	28	7	35
8. Track & field	18	13	31
9. Group lessons at the gym (e.g. Les Mills)	5	26	31
10. Cross-country skiing	15	15	30

11.	Horse riding	3	24	27
12.	Yoga / pilates	4	22	26
13.	Ice hockey	23	2	25
14.	Volleyball	16	7	23
15.	Finnish baseball	15	6	21
16.	Dancing	6	15	21
17.	Martial arts (e.g. boxing, taekwondo, judo, karate etc.)	14	7	21
18.	Tennis	15	3	18
19.	Basketball	11	6	17
20.	Gymnastics	3	12	15
21.	E-sports	9	1	10
22.	Orienteering	7	3	10
23.	Wrestling	7	2	9
24.	Motor sport (e.g. karting, enduro)	5	3	8
25.	Alpine skiing	5	2	7
26.	Snowboarding	3	3	6
27.	Figure skating	0	5	5
28.	Ballet	0	5	5
29.	Golf	4	0	4
30.	Cheerleading	0	4	4
31.	Agility	0	4	4
32.	Synchronized skating	1	1	2
33.	Other	14	12	26
34.	Nothing	15	13	28
	Total	119	120	239

There were questions related to the costs of children's sport hobbies. Parents were asked how much money they spend to their children's sport hobbies per month, and the following question contained an opinion about the costs. Half of the respondents (50.6 %) spent 0–50 euros a month, and 33,5 percent spent 51–250 euros a month. When asked how they perceived these costs, 41.4 percent considered that the costs were reasonable, and 26 percent considered the costs rather or too expensive. Tables 8 and 9 present these results. It needs to be pointed out that details about the costs per sport discipline cannot be drawn from the data.

TABLE 8. Money spent on children's sport hobbies per month

	Frequency	Valid Percent	Cumulative Percent
0-50 euros	121	50,6	50,6
51-150 euros	54	22,6	73,2
151-250 euros	26	10,9	84,1
251-350 euros	12	5,0	89,1
351-450 euros	13	5,4	94,6
451-550 euros	7	2,9	97,5
551-650 euros	3	1,3	98,7
851-999 euros	1	,4	99,2
Over 1000 euros	2	,8	100,0
Total	239	100,0	

TABLE 9. Opinions about the costs

	Frequency	Valid Percent	Cumulative Percent
Too expensive	14	5,9	5,9
Rather expensive	48	20,1	25,9
Reasonable	99	41,4	67,4
Rather affordable	29	12,1	79,5
Too affordable	7	2,9	82,4
I cannot say	42	17,6	100,0
Total	239	100,0	

### 5.1.2 Children and adolescents participating in physical activities

Parents were asked to give an opinion about their children's physical activities. If the respondent had more than one child, they were asked to give an opinion considering only the oldest and the second oldest child separately. Totally, parents gave opinions about 228 children and adolescents participating in physical activities whether in organized and/or recreational manner. Of the children, 67 percent were the only or the oldest child, and 33 percent were the second oldest child. Gender-wise 50.4 percent were girls, and 49.6. percent were boys. Of the

children, 18.4 percent were aged six or under, 38.6 percent were aged 7–12, and 43 percent were adolescents aged 13–19. Age groupings are presented in Table 10.

TABLE 10. Age groups of the children

	Frequency	Valid Percent	Cumulative Percent
6 or under	42	18,4	18,4
7-12	88	38,6	57,0
13-19	98	43,0	100,0
Total	228	100,0	

In addition, it was asked how many different sport hobbies the child had and what was the starting age of the first hobby. Half of the children (53.5 %) had one sport hobby, 28.9 percent had two sport hobbies, and the rest (17.6 %) more than three different sport hobbies. Mean number of hobbies for all the children was  $M=1.73$ , for girls  $M=1.61$ , and for boys  $M=1.85$ . Number of hobbies for girls and boys are presented in Table 11, and the number of hobbies per age group in Table 12.

TABLE 11. Number of hobbies per sex of a child (N=frequency)

Number of hobbies	Girl	Boy	Total
1	66	56	122
2	34	32	66
3	10	18	28
4	4	3	7
5	1	1	2
More than 5	0	3	3
Total	115	113	228

TABLE 12. Number of hobbies per age group (N=frequency)

Number of hobbies	6 or under	7-12	13-19	Total
1	23	41	58	122
2	11	25	30	66
3	6	16	6	28
4	2	3	2	7
5	0	2	0	2
More than 5	0	1	2	3
Total	42	88	98	228

Majority (54.7 %) of the children aged six or under had one sport hobby, 26.1 % had two sport hobbies, and the rest (19 %) had three or four sport hobbies. Similarly, 46.5. percent of the 7–12-year-olds had one sport hobby, 28.4 percent had two sport hobbies, 18.1. percent had three sport hobbies, and the rest (6.8 %) had over four sport hobbies. In adolescents' group, 59.1 percent had one sport hobby, 30.6 percent had two sport hobbies, and the rest (10.2 %) had three or more sport hobbies. A mean number of hobbies for children aged six or under was  $M=1.69$ , for children aged 7–12  $M=1.90$ , and for adolescents aged 13–19-year-olds  $M=1.59$ . A common starting age of the first sport hobby was under age of five, since 30.7 percent had started their first hobby at that age. However, some of the children had started their first sport hobby rather late, at their teens. Details can be seen in Table 13.

TABLE 13. Starting age of the first hobby

	Frequency	Valid Percent	Cumulative Percent
Under 5	70	30,7	30,7
5-6	54	23,7	54,4
7-8	40	17,5	71,9
9-10	24	10,5	82,5
11-12	21	9,2	91,7
13-14	11	4,8	96,5
15-16	6	2,6	99,1
17-19	2	,9	100,0
Total	228	100,0	

Activity level of a child was inquired with two separate questions. The first question covered hours spent on organized sports per week, and the second hours spent on recreational physical activities per week. A worrying result was that 10.5 percent of the children were not participating in organized sport activities at all, and 9.6 percent were not physically active on recreational basis at all. However, it cannot be said that same children/adolescents were part of both groups.

Slightly over third (36.4 %) participated in organized sports 1–2 hours per week, 28.5 percent 3–4 hours, and 15 percent 5–7 hours per week. Of the children, 4.8 percent of the girls and 5.7 percent of boys did not participate in organized sports at all whereas 9.6 percent participated eight hours or more. However, in total boys spent more hours on organized sports compared to girls. Adolescents aged 13–19 were the most active group participating in organized sports but also the least active belonged to this group, since 6.6 percent did not exercise at all. Table 14 shows the details.

TABLE 14. Hours spend on organized sports per week (N=frequency)

<b>Hours</b>	<b>Girls</b>	<b>Boys</b>	<b>Total</b>	<b>6 or under</b>	<b>7-12</b>	<b>13-19</b>	<b>Total</b>
0	11	13	24	4	5	15	24
1-2	53	30	83	22	39	22	83
3-4	26	39	65	13	24	28	65
5-7	17	17	34	2	12	20	34
8-10	4	13	17	0	8	9	17
Over 10	4	1	5	1	0	4	5
<b>Total</b>	<b>115</b>	<b>113</b>	<b>228</b>	<b>42</b>	<b>88</b>	<b>98</b>	<b>228</b>

When hours spent on recreational physical activities were investigated, 37.2 percent of the children did recreational physical activities 1–2 hours per week, 32.4 percent 3–4 hours, and 11.8 percent 5–7 hours per week. Of the children 3,9 percent of the girls and 5,7 percent of boys did not practice recreational physical activities at all whereas 8.7 percent did eight hours or more per week. Girls spent more hours on recreational physical activities compared to boys, except in 5–7 hours group. Different age groups spent similar amount of time in recreational physical activities. Table 15 shows the details.

TABLE 15. Hours spend on recreational physical activities per week (N=frequency)

Hours	Girls	Boys	Total	6 or under	7-12	13-19	Total
0	9	13	22	6	8	8	22
1-2	48	37	85	16	31	38	85
3-4	40	34	74	10	33	31	74
5-7	9	18	27	6	8	13	27
8-10	3	6	9	1	4	4	9
Yli 10	6	5	11	3	4	4	11
<b>Total</b>	<b>115</b>	<b>113</b>	<b>228</b>	<b>42</b>	<b>88</b>	<b>98</b>	<b>228</b>

Respondents were also asked to give their opinion about the two most practiced sport disciplines per child. The given list contained the same options than parents' list. A noteworthy point must be made. Some of the respondents could have mentioned total of four different sport disciplines, two most practiced sport disciplines per child. When these mentions have been calculated together, the top ten most practiced sport disciplines among children were: football, floorball, dancing, swimming, cycling, walking, gym / fitness, gymnastics, horse riding, and volleyball. Top five sport disciplines for boys were football, floorball, cycling, swimming, walking and ice hockey, and for girls dancing, horse-back riding, gymnastics, cheerleading, and swimming. The rest of the list by sex of the child can be seen in Table 16. When it was investigated whether children participated in individual or team sports, 51.2 percent of the children did individual sports, girls (69.4 %) more than boys (32.3 %), whereas 32.9 percent of the children did team sports, boys (42.8 %) more than girls (23.1 %). Additionally, 16 percent of the children did both; 24.7 percent of the boys did both, and 7.4 percent of the girls did both.

TABLE 16. The most practiced sport hobbies of children (N=total mentions)

		Girl	Boy	Total
1.	Football	9	33	42
2.	Floorball	4	28	32
3.	Dancing	26	1	27
4.	Swimming	10	8	18
5.	Cycling	5	12	17



6.	Walking	9	8	17
7.	Gym/fitness	9	7	16
8.	Gymnastics (e.g. artistic, rhythmic, trampoline)	12	3	15
9.	Horse riding	13	2	15
10.	Volleyball	5	6	11
11.	Cheerleading	10	0	10
12.	Ice hockey	1	8	9
13.	Basketball	4	5	9
14.	Track & Field	5	4	9
15.	E-sports	2	7	9
16.	Finnish baseball	2	5	7
17.	Martial arts	2	5	7
18.	Running	3	4	7
19.	Ballet	6	0	6
20.	Alpine skiing	1	4	5
21.	Figure skating	2	2	4
22.	Cross-country skiing	0	3	3
23.	Snowboarding	0	3	3
24.	Synchronized skating	2	0	2
25.	Tennis	0	2	2
26.	Golf	1	1	2
27.	Yoga/Pilates	1	1	2
28.	Motor sport	1	0	1
29.	Wrestling	1	0	1
30.	Orienteering	1	0	1
31.	Agility	1	0	0
32.	Group lessons at the gym	1	0	0
33.	Other	18	15	33
	Total	167	177	344

The next question was related to why the child is participating in specific physical activity from a respondent's point of view. The respondent was asked to choose 1–3 reasons from a given list per physical activity per child. Thus, if a respondent had two children who were practicing total of four different sport disciplines, a respondent gave 1–3 reasons for all those four disciplines. Top three reasons for doing team sports were: child's own motivation, that sport discipline fits child's capabilities (child will be good at it), and child's friends do the same sport discipline and a child wanted to follow them. Top three reasons for doing individual sports were child's own motivation, that sport discipline fits child's capabilities (child will be good at it), and it is easily accessible (e.g. nearby, good transportation options). Tables 17 and 18 shows reasons for team sport and individual sport participation separately.

TABLE 17. Reasons for participating in team sports (N=total mentions)

Reasons	N
1. Child's own motivation	65
2. That sport discipline fits child's capabilities (child will be good at it)	29
3. Child's friends do the same sport discipline and a child wanted to follow them	27
4. That sport discipline is teaching valuable physical skills	20
5. It is easily accessible (e.g. nearby, good transportation options)	18
6. Father's sports background affected / directed the decision	13
7. That sport discipline is teaching valuable social skills	12
8. The costs are cheap	12
9. I have a role as team manager / team carer / team treasurer	11
10. The image of the sport is good	11
11. Siblings affected the decision (they are doing the sport discipline as well)	9
12. Mother's sports background affected / directed the decision	7
13. Idols / role models of the sport aroused the interest	7

14.	Grandparent's sports background affected / directed the decision	5
15.	I coach in that sport	5
16.	There were no other options available nearby	5
17.	Parent's idols / role models aroused the interest	3
18.	There were no other options available financially	2
19.	Other reason	4
	Total	265

TABLE 18. Reasons for participating in individual sports (N=total mentions)

Reasons	N
1. Child's own motivation	90
2. This sport discipline fits child's capabilities (child will be good at it)	46
3. It is easily accessible (e.g. nearby, good transportation options)	43
4. That sport discipline is teaching valuable physical skills	32
5. The costs are cheap	30
6. Mother's sports background affected / directed the decision	22
7. Child's friends do the same sport discipline and a child wanted to follow them	21
8. Father's sports background affected / directed the decision	16
9. That sport discipline is teaching valuable social skills	16
10. There were no other options available financially	12
11. Siblings affected the decision (they are doing that sport discipline as well)	10
12. There were no other options available nearby	7
13. Idols / role models of the sport aroused the interest	6

14. Parent's idols / role models aroused the interest	6
15. The image of the sports is good	5
16. I have a role as team manager / team carer / team treasurer	3
17. Grandparent's sports background affected / directed the decision	2
18. I coach in that sports	0
19. Other reason	17
Total	384

Respondents were also asked to answer whether their child had quit an organized sport hobby previously. If the answer was yes, a respondent received a question considering the reasons why a child had ended an organized sport hobby. The respondent could choose 1–3 reasons from a given list. Out of 228 children, 40 percent had ended an organized sport hobby. The reasons for quitting are presented in Table 19.

TABLE 19. Reasons for quitting an organized sport hobby (N=total mentions)

	N	Percent
A lack of child's own motivation	41	32,3%
The costs rose too high	14	11,0%
Quality of coaching	14	11,0%
Child's friends ended the same hobby	13	10,2%
Healthy issues forced to quit	12	9,4%
Behaviour of the coach	12	9,4%
Lack of time	11	8,7%
Other reason	8	6,3%
I don't want to answer	2	1,6%
Total	127	100,0%

The most mentioned reason for quitting an organized sport hobby was a lack of child's own motivation. The second most mentioned was high costs together with the quality of coaching.

It is noteworthy to point out that 20.4 percent mentioned that their child had quit an organized sport hobby because of the quality of coaching or because of the behavior of the coach.

Furthermore, it was asked, how the child is transporting to his/her hobbies. Almost a half (47.8 %) mentioned that parents take by a car, 26.8 percent mentioned that child walks or cycles, and 9.2 percent mentioned that child uses public transportation. In total, sixty percent of the children were taken to their hobbies by a car, and 13.1 percent used other motor vehicles.

TABLE 20. How does the child transport to hobbies?

	Frequency	Valid Percent	Cumulative Percent
Parents take by a car	109	47,8	47,8
Child walks / cycles	61	26,8	96,1
Child uses public transportation	21	9,2	69,3
Child's friends' parents take by a car	16	7,0	60,1
Grandparents / other relatives take by a car	12	5,3	53,1
Child uses moped / moped car	9	3,9	100,0
Total	228	100,0	

## 5.2 Statistical analysis

This section presents the results of the statistical tests. First children's demographic variables and their relation with physical activity are checked, and after that parental correlates and their relation with children's physical activity are investigated.

### 5.2.1 Gender and age of the child

Mean number of hobbies for girls was  $M=1.61$ , and for boys  $M=1.85$ . Mann-Whitney test was used to test whether there was a statistical difference between the girls' and boys' number of hobbies. The test showed no statistically significant difference between the groups ( $p=0.125$ ). This result indicated that based on means, boys had more hobbies than girls, however the difference was not statistically significant.

Comparison between number of hobbies and children's age groups was also made. Mean number of hobbies for children aged six or under was  $M=1.69$ , for 7–12-year-olds  $M=1.90$ , and for 13–19-year-olds  $M=1.59$ . Kruskal-Wallis test showed that there was no statistically significant difference between these groups ( $p=0.089$ ) however the result was close being statistically significant. This result proposed that children aged 7–12 had more hobbies than under school-aged children, and adolescents aged 13–19. Besides, the result showed that older children had fewer sport hobbies than younger children even though the result was not statistically significant.

Next, it was investigated if there was a difference between gender of the child and team/individual sport participation. Table 21 presents the distribution of team/individual sport participation by gender of a child. Table lacks mentions from discipline "other" since it was a closed ended question and therefore those answers cannot be grouped into individual or team sport categories.

TABLE 21. Individual/team sport participation by gender of a child (N=frequency)

	Girl	Boy	Total
Individual sport	75	34	109
Team sport	25	45	70
Both	8	26	34
Total	108	105	213

It is seen that individual sport disciplines were practiced more than team sports disciplines. When gender differences were investigated in more detail, girls did more individual sports (N=75) compared to boys (N=34), and boys did more team sports (N=45) compared to girls (N=25). In addition, boys practiced more of both (N=26) than girls (N=8). Mann-Whitney test was made to compare differences between the genders, and the result revealed that there was a statistically significant difference between girls and boys ( $p=0.000$ ) meaning that boys did more team sports and girls did more individual sports. In addition, a difference between age groups and team/individual sport participation was tested with Kruskal-Wallis test. The test showed that there was no statistically significant difference between different the age groups ( $p=0.200$ ), indicating that child's participation in individual/team sports was not affected by the age of a child but gender of the child.

Next, it was tested whether there was a difference between girls' and boys' organized and recreational physical activity level. In this point, it needs to be noted that there were six answer options, which were related to hours spent on physical activities. Option (1) indicated zero hours spent on physical activities per week, (2) 1–2 hours, (3) 3–4 hours, (4) 5–7 hours, (5) 8–10 hours, and option six (6) indicated over ten hours. Option (1), zero hours, was included in the mean value. Girls did organized sports  $M=2.67$  hours on a weekly basis and recreational physical activities  $M=2.71$  hours per week. Boys did organized sports  $M=2.91$  hours per week and recreational physical activities  $M=2.84$  hours per week. Mann-Whitney test was made to see that there was no statistically significant difference between gender of the child and organized sports participation ( $p=0.058$ ) however the result was close being statistically significant. No difference was found between gender of the child and recreational physical activities ( $p=0.363$ ). It can be stated that boys seemed to spend more hours on organized physical activities than girls, and the result was close being statistically significant.

The same comparison was made between age groups and organized and recreational physical activity level. Children aged six-years or under did organized sports  $M=2.40$  hours per week and recreational physical activities  $M=2.74$  hours per week. Children aged 7–12 did organized sports  $M=2.76$  hours per week and recreational physical activities  $M=2.78$  hours per week. Adolescents aged 13–19 did organized sports  $M=2.98$  hours per week and recreational physical activities  $M=2.79$  hours per week. Kruskal-Wallis test was made to see whether there were

differences between these groups. There was statistically significant difference ( $p=0.030$ ) between age groups and organized sports, especially between the groups six-year old and under, and adolescents aged 13–19 ( $p=0.008$ ). This result indicated that adolescents did more organized sports than under school-aged children. No difference was found between age groups and recreational physical activities ( $p=0.859$ ).

Top five practiced sport disciplines for boys were football, floorball, cycling, swimming, walking, and ice hockey. Top five for girls was dancing, horse-back riding, gymnastics, cheerleading, and swimming. The top three reasons for these top disciplines are presented in tables 22 and 23. Numbers in the tables represents the rank order of the reason. Number one indicates that reason was the most mentioned reason, number two the second most, and so forth.

TABLE 22. Top 3 reasons for boys per sport discipline

BOYS	Football	Floorball	Cycling	Swimming	Walking	Ice hockey
Mother's sports background affected / directed the decision						
Father's sports background affected / directed the decision				3.		2.
Grandparent's sports background affected / directed the decision						
Other siblings affected the decision (they are doing that sports as well)						
A child's friends do the same sport and a child wanted to follow them		2.				
I have a role as a coach in that sports						
I have a role as team manager / team carer / team treasurer						
Child's own motivation	1.	1.	1.	2.	3.	1.
That sport is teaching valuable physical skills						
That sport is teaching valuable social skills	3.					
It is easily accessible (e.g. nearby, good transportation options)		3.				3.*
The costs are cheap			3.			
The image of the sports is good						3.*
This sport fits child's capabilities (a child will be good at it)	2.		2.	1.	1.	3.*
There were no other options available nearby						
There were no other options available financially					2.	
Idols / role models of the sport aroused the interest						
Parent's idols / role models aroused the interest						
Other reason						
<b>Total</b>						
* same amount of mentions						



TABLE 23. Top 3 reasons for girls per sport discipline

<b>GIRLS</b>	<b>Dancing</b>	<b>Horse-back riding</b>	<b>Gymnastics</b>	<b>Cheerleading</b>	<b>Swimming</b>
Mother's sports background affected / directed the decision					
Father's sports background affected / directed the decision					
Grandparent's sports background affected / directed the decision					
Other siblings affected the decision (they are doing that sports as well)					
A child's friends do the same sport and a child wanted to follow them		3.	3.		
I have a role as a coach in that sports					
I have a role as team manager / team carer / team treasurer					
Child's own motivation	1.	1.	1.	1.	1.
That sport is teaching valuable physical skills	3.*			3.*	
That sport is teaching valuable social skills					
It is easily accessible (e.g. nearby, good transportation options)	3.*	2.	2.		3.
The costs are cheap	3.*				
The image of the sports is good				3.*	
This sport fits child's capabilities (a child will be good at it)	2.			2.	2.
There were no other options available nearby					
There were no other options available financially					
Idols / role models of the sport aroused the interest					
Parent's idols / role models aroused the interest					
Other reason					
<b>Total</b>					
* same amount of mentions					

As it is presented in Table 22, the most mentioned reason for boys was child's own motivation. The second most mentioned was this sport fits child's capabilities (child will be good at it), and the third most mentioned was it is easily accessible together with father's sport background affected/directed the decision. For girls, Table 23 shows that the most mentioned reason was also child's own motivation. The second most mentioned was it is easily accessible, and third most mentioned was this sport fits child's capabilities. Thus, it can be concluded that even though the sport disciplines practiced differed between boys and girls, especially boys did more organized physical activities and girls did more individual physical activities, the reasons for practicing were similar.

### 5.2.2 Socio-demographic factors and number of hobbies

Mann-Whitney test was used to compare the number of hobbies the child had and gender of the parent. A mean number of hobbies for the child of the male respondent was  $M=1.95$  and for a female respondent  $M=1.52$ . There was statistically significant difference ( $p=0.005$ ) between the groups indicating that gender of the parent was related with number of hobbies the child had. Children of the male respondent had more hobbies than the child of the female respondent. In addition, difference between parental status and number of hobbies was tested with Kruskal-Wallis test. Parental status was first recoded into three groups: both parents are living with the

child/children, joint custody, and single parent. Mean number of hobbies for these groups were: both parents are living with the child/children  $M=1.56$ , joint custody  $M=1.99$ , and single parent  $M=1.88$ . The test showed no statistically significant difference between these groups ( $p=0.078$ ) however  $p$ -value was close being statistically significant. As a conclusion, gender of the parent was related with number of hobbies a child had but parental status had no relation.

A comparison between education level of the parent and number of hobbies the child had was made. Education level was recoded into five groups: comprehensive school, upper secondary school, vocational school, university of applied sciences, and university. Mean number of hobbies for different education levels were the following: comprehensive school  $M=1.25$ , upper secondary school  $M=2.06$ , vocational school  $M=1.50$ , university of applied sciences  $M=1.97$ , and university  $M=1.72$ . Kruskal-Wallis test was used to see whether education level of the parent was associated with the number of hobbies the child had. There was statistically significant difference ( $p=0.015$ ) between these groups meaning that education level of the parent was related with the number of hobbies a child had. Especially, there were statistically significant differences between comprehensive school and university ( $p=0.048$ ), comprehensive school and university of applied sciences ( $p=0.007$ ), comprehensive school and upper secondary school ( $p=0.026$ ), and vocational school and university of applied sciences ( $p=0.008$ ). These results could be interpreted that the child whose parent had a comprehensive school education, had fewer sport hobbies than the child whose parent had higher education.

Next, a comparison was made between income level of the family (gross income per year) and number of hobbies the child had. Income level was recoded into three different groups: the first group was under 30.000 euros/year, the second group 30.001-70.000 euros/year, and the third group over 70.000 euros/year. A mean number of hobbies for the first group was  $M=1.84$ , for the second group  $M=1.56$ , and for the third group  $M=2.02$ . Kruskal-Wallis test indicated that there was statistically significant ( $p=0.044$ ) difference between the groups. Especially, there was statistically significant difference ( $p=0.014$ ) between the second and the third group indicating that the higher an income level in the family was, the more hobbies the child had.

Furthermore, an association between a resident area of the respondent and children's number of hobbies was tested. Resident area was recoded into three different groups: the first one was a large town with over 100.000 inhabitants, the second group small or medium sized town or municipality with 20.000–100.000 inhabitants, and the third group a countryside/sparsely populated area. A mean number for hobbies for the first group was  $M=1.81$ , for the second group  $M=1.46$ , and for the third group  $M=1.90$ . Kruskal-Wallis test indicated that there was statistically significant ( $p=0.017$ ) difference between the groups. Particularly, there was statistically significant difference ( $p=0.027$ ) between the second and the third group indicating that children who live in a countryside / sparsely populated area had more hobbies than children living in a small or medium sized town or municipality. Furthermore, statistically significant difference ( $p=0.007$ ) was found between the second and the first group indicating that children living in a large town had more hobbies than children living in a small or medium sized town or municipality.

### **5.2.3 Socio-demographic factors and child's organized and recreational physical activity**

Relation between gender of the parent and hours the child spent on organized and/or recreational physical activities was investigated. It needs to be again noted that there were six answer options, which were related to hours spent on physical activities. Option (1) indicated zero hours spent on physical activities per week, (2) 1–2 hours, (3) 3–4 hours, (4) 5–7 hours, (5) 8–10 hours, and option six (6) indicated over ten hours. Option (1), zero hours, was included in the mean value.

A child of the male respondent spent  $M=2.99$  hours per week on organized sports and  $M=2.87$  hours per week on recreational physical activities. A child of the female respondent spent  $M=2.60$  hours per week on organized sports and  $M=2.68$  hours per week on recreational physical activities. Mann-Whitney test showed that there was statistically significant difference between gender of the parent and organized sports ( $p=0.007$ ) indicating that the child of the male respondent did more organized sports than the child of the female respondent. There was no difference between gender of the parent and hours spent on recreational physical activities ( $p=0.912$ ).

Next, parent's education level and its association with child's organized and/or recreational physical activity was investigated. Table 24 shows mean hours for child's organized and recreational physical activity participation per education of the parent. Kruskal-Wallis test revealed that education level of the parent was related with organized sport participation ( $p=0.012$ ) of the child but not with recreational physical activity ( $p=0.258$ ). It is seen from the Table 24 that children whose parent had university of applied science education practiced more both organized sports and recreational physical activities than children whose parents had other level of education.

TABLE 24. Parent's education and means for children's physical activity

		Hours per week: organized sports	Hours per week: recreational physical activities
Comprehensive school	Mean	2,12	2,50
	N	16	16
Upper secondary school	Mean	2,94	2,78
	N	32	32
Vocational school	Mean	2,76	2,66
	N	70	70
University of applied sciences	Mean	3,24	3,00
	N	37	37
University	Mean	2,66	2,75
	N	71	71
Total	Mean	2,79	2,75
	N	226	226

The differences between education level of the parent and organized sport participation of the child were investigated in more detail. There were statistically significant differences between comprehensive school and vocational school ( $p=0.048$ ), comprehensive school and upper secondary school ( $p=0.046$ ), comprehensive school and university of applied sciences ( $p=0.001$ ), university and university of applied sciences ( $p=0.009$ ), and vocational school and university of applied sciences ( $p=0.024$ ). These results proposed that children whose parent had comprehensive school education, spent less hours on organized sports. In addition, children

whose parent had education from the university of applied sciences spent more hours on organized sports than children whose parent had university education.

Besides, income level of the family and its association with child's organized sport participation and recreational physical activity was investigated. Kruskal-Wallis test demonstrated similar results as with education level; income level of the family was related with hours spent on organized sports ( $p=0.005$ ) but not with hours spent on recreational physical activities ( $p=0.891$ ). Particularly, there were statistically significant differences between the second and the third income level group ( $p=0.001$ ), and between the first and the third income level group ( $p=0.027$ ), indicating that the higher an income level in the family was, the more hours the child spent on organized sport activities.

In addition, resident area's influence on organized sport participation and recreational physical activity of the child was tested. Mean values showed that children residing in a larger town with over 100.000 inhabitants ( $M=2.95$ ) and children living in a countryside/sparsely populated area ( $M=2.83$ ) spent slightly more hours on organized sports than children living in a small or medium sized town or municipality ( $M=2.52$ ). However, Kruskal-Wallis test showed no statistically significant difference between these groups although the difference was close being statistically significant ( $p=0.072$ ). Mean values for recreational physical activity can be seen in Table 25. There was no statistically significant difference between these groups ( $p=0.310$ ). A conclusion can be drawn that resident area was not associated with child's organized or recreational physical activity. However, based on means, children residing in a larger town spent more time on organized sports than recreational sports whereas children residing in a small or medium sized towns or countryside/sparsely populated area spent slightly more time on recreational physical activities than in organized sports.

TABLE 25. Resident area and means for physical activities

		Hours per week: organized sports	Hours per week: recreational physical activities
Larger town over 100.000 inhabitants	Mean	2,95	2,66
	N	100	100
Small or medium sized town with 20.000-100.000 inhabitants	Mean	2,52	2,86
	N	69	69
Countryside	Mean	2,83	2,88
	N	59	59
Total	Mean	2,79	2,78
	N	228	228

#### 5.2.4 Correlation between parent's and child's physical activity

Spearman rank-order correlation was used to investigate the correlation between parent's own physical activity level (hours and times per week), and hours the child spent on organized and/or recreational physical activities. The test showed a small positive correlation ( $r=0.240$ ), that was statistically significant ( $p=0.003$ ) between parent's own physical activity level (hours per week) and hours the child spent on recreational physical activities. No statistically significant correlation was found between parent's own physical activity level and hours the child spent on organized physical activities. A similar way of result was found when compared parent's own physical activity level (times per week) and hours the child spent on recreational physical activities ( $r=0.207$ ,  $p=0.010$ ). No statistically significant correlation was found between parent's own physical activity level (times per week) and hours the child spent on organized sports.

Furthermore, a correlation was investigated in more detail by gender of the parent. Results revealed that there was a small positive correlation ( $r=0.261$ ) between father's activity level and child's recreational physical activity ( $p=0.026$ ), but no correlation between organized sport participation ( $p=0.062$ ), however the result was close to statistical significance. Mother's

activity level did not have correlation either with organized sport participation ( $p=0.160$ ) or with recreational physical activity ( $p=0.190$ ).

In addition to gender of the parent, a correlation was tested with education level of the parent and income level of the family. The only statistically significant, a small positive correlation was found between vocational school level education and child's recreational physical activity ( $r=0.324$ ,  $p=0.025$ ). With income levels, there was a small positive correlation only with income level over 70.000 euros /year and child's organized sports participation ( $r=0.322$ ,  $p=0.055$ ), and recreational physical activity ( $r=0.322$ ,  $p=0.055$ ). These results indicated that children from higher socio-economic status families spent more time on physical activities than children from lower socio-economic status. Especially, parent's vocational school education correlated with hours the child spent on recreational physical activities, and high income level correlated with hours the child spent on organized sports.

Furthermore, a correlation between older sibling's physical activity level and younger sibling's physical activity level was investigated. Interestingly, a strong positive correlation was found between older sibling's organized sports participation and younger sibling's organized sport participation ( $r=0.570$ ,  $p=0.000$ ). Besides, a strong positive correlation was also found between older sibling's recreational physical activity level and younger sibling's recreational physical activity level ( $r=0.617$ ,  $p=0.000$ ). Based on these results, it could be assumed that an older sibling had a bigger influence on younger sibling's physical activity level than parental modeling had.

#### **5.2.5 Socio-demographic factors and team/individual sport participation**

Besides, comparisons between income level of the family and child's team sport/individual sport participation, together with education of the parent and child's team sport/individual sport participation were made. No difference between income level of the family and child's individual/team sport participation was found ( $p=0.911$ ), and no difference between education level of the parent and child's individual/team sport participation was found ( $p=0.677$ ). This

result indicated that income level of the family and education level of the parent were not associated with child's team sport or individual sport participation.

When resident area and team/individual sport participation was investigated, statistically significant difference ( $p=0,000$ ) was found, specifically between a countryside/sparsely populated area and a large town ( $p=0.001$ ), and between a small or medium sized town or municipality and a large town ( $p=0.001$ ). Means for these categories were: a large town  $M=1.87$ , small or medium sized town or municipality  $M=1.48$ , and countryside/sparsely populated area  $M=1.46$ . A mean closer to two indicates team sports and a mean closer to one indicates individual sports. Thus, results suggested that children who lived in larger towns participated more in team sports and children who lived in smaller towns or countryside/sparsely populated area practiced more individual sports.

There was a difference between parental status and whether the child was participating in individual or team sports ( $p=0.001$ ). Especially, there was a difference between a single parent and joint custody ( $p=0.002$ ), and between both parents living with a child and joint custody ( $p=0.001$ ). Means for these categories were: both parents are living with a child  $M=1.55$ , joint custody  $M=1.90$ , and single parent  $M=1.29$ . This result indicated that children, whose parent had joint custody did more team sports than other children. In addition, children who had a single parent participated more in individual sports than other children.

#### **5.2.6 Parental support**

One of the interests in this study was to find out, how parents are involved in their children's hobbies. The given list of answers contained choices related to encouragement, instrumental support, parental modeling, and overall support/influence. The respondent could choose multiple choices. The top five parental support were encourage/cheer, taking the child to practice, paying the costs, cooking, and doing laundry. Gender of the parent, education level of the parent, income level of the family, resident area, and parental status were compared to parental support to see if these were associated with different level of parental support.



Table 26 presents parental support by gender of the parent and with a p-value. Table shows that mothers seemed to be more involved in their child's sport hobbies than fathers. Kruskal-Wallis test was made to see whether there were statistically significant differences between fathers and mothers. Statistically significant differences were discovered between encouragement ( $p=0.014$ ), paying the costs ( $p=0.019$ ), cooking and doing laundry ( $p=0.000$ ), being physically active with a child ( $p=0.035$ ), and following child's physical activity ( $p=0.016$ ). As a conclusion, mothers were more involved in their child's physical activities, particularly mothers were more encouraging, payed more costs, did more cooking and laundry, did more physical activities with a child, and followed child's physical activities more than fathers.

TABLE 26. Parental support by gender of the parent (N=frequency)

	Men	Women	Total	p-value
I encourage / cheer	39	58	97	0.014
I take the children to practice	39	43	82	0.968
I pay the costs (e.g. equipment, monthly fees)	30	48	78	0.019
I cook	22	51	73	0.000
I do the laundry	18	51	69	0.000
I do physical activities / sports together with my children	20	35	55	0.035
I follow my children's activity from a stand	16	32	48	0.016
I take the children to matches / competitions	20	22	42	0.989
I work as a volunteer in a club / team	4	7	11	0.434
I do not participate in any way	4	3	7	0.609
I work as a team / club manager/carer/treasurer	1	5	6	0.120
Total mentions	213	355	568	

Next, education level of the parent and level of parental support was tested. Statistically significant differences were found in taking children to matches/competitions, and not participating in any way. Especially, statistically significant differences were found "taking children to matches/competitions" between vocational school education and upper secondary education ( $p=0.035$ ), vocational school education and the university of applied sciences (0.007), and between university and the university of applied sciences ( $p=0.026$ ). Results indicated that children whose parent had upper secondary school education took children more to matches and competitions than children whose parent had vocational school education. Besides, children

whose parent had education from the university of applied science took children more to matches and competitions than children whose parent had vocational school or university level education. Test showed that parents who had comprehensive school education did participate less on their child's hobbies than those parents who had higher education ( $p=0.001$ ).

Income level and the level of parental support was also tested. There were differences between the groups in paying the costs ( $p=0.028$ ) and working as a volunteer in a club/team ( $p=0.037$ ). When considering "paying the costs" there were statistically significant differences between 30.001 – 70.000 euros / year, and over 70.000 euros/ year ( $p=0.012$ ), and between under 30.000 euros / year, and over 70.000 euros / year ( $p=0.033$ ). It seemed that those parents whose level of income in a year was over 70.000 euros paid costs more than those parents who earned less. When considering "working as a volunteer in a club/team" there was statistically significant difference between under 30.000 euros / year, and over 70.000 euros / year ( $p=0.011$ ) indicating that those parents who earned over 70.000 euros / year participated more on volunteer tasks than those parents who earned under 30.000 euros / year.

In addition, resident area and the level of parental support was tested. There were differences between the groups in cooking ( $p=0.005$ ) and doing the laundry ( $p=0.001$ ). When considering "I cook" there was statistically significant difference between a large town with over 100.000 inhabitants, and small or medium sized town or municipality ( $p=0.020$ ), indicating that parents living in a large town cooked less than parents living in a small or medium sized town or municipality. Furthermore, parents living in larger towns did laundry less than parents living in a small or medium sized town or municipality ( $p=0.000$ ) or countryside/sparsely populated area ( $p=0.011$ ).

Finally, parental status and level of parental support was tested. There were statistically significant differences in encouragement ( $p=0.025$ ), paying the costs ( $p=0.006$ ), cooking ( $p=0.001$ ), doing the laundry ( $p=0.006$ ), and following child's physical activities from a stand ( $p=0.018$ ). In encouragement, there were differences between joint custody and both parents living with the child/children ( $p=0.012$ ), and between joint custody and single parent ( $p=0.055$ ). In "paying the costs", there were differences between joint custody and both parents living with

the child/children ( $p=0.002$ ), and between joint custody and single parent ( $p=0.060$ ). In cooking, there were differences between joint custody and both parents living with a child/children ( $p=0.004$ ), and between joint custody and single parent ( $p=0.002$ ). In “doing the laundry”, there were differences between joint custody and both parents living with a child/children ( $p=0.008$ ), and between joint custody and single parent ( $p=0.008$ ). Finally, in “following child’s physical activities from a stand”, there were differences between joint custody and both parents living with a child/children ( $p=0.005$ ). Thus, results revealed that those children whose both parents live with the child/children experienced more parental support than children whose parents had joint custody. In addition, children whose parents had joint custody experienced more parental support than children whose parent was a single parent, especially in the areas of encouragement, paying the costs, cooking, doing laundry, and following child’s physical activities.

## **6 DISCUSSION AND CONCLUSION**

This chapter discusses the results in more detail and links them to the previous research knowledge. Furthermore, reliability and validity of the study are discussed. Chapter ends with highlighting directions for future research.

### **6.1 Main findings**

The aim of this study was to investigate how different factors, specifically parental correlates are associated with physical activity of children and adolescents in Finland. Particularly, the aim was to find out how different parental socio-demographic factors (gender, education level, income level, and residential area), parental role modeling, and parental support (encouragement, modeling, instrumental support, and overall support/influence) are associated with number of hobbies the child has, hours the child spends at organized and/or recreational physical activities, and whether the child is practicing individual or team sports. In addition, a correlation between parental physical activity level and child's physical activity level were investigated. Furthermore, different socio-demographic factors of children (gender and age) and their association with physical activity level were tested. Study was conducted from a parental point of view.

First research question and hypotheses were:

1. How do parents' socio-demographic factors relate with the physical activity level of the child?
  - H1: Socio-demographic factors relate with the number of child's sport hobbies
  - H2: Socio-demographic factors relate with the number of hours that the child spends at organized and recreational physical activities
  - H3: Socio-demographic factors relate with whether the child is engaging in team sports or individual sports

Previous research has found that different parental correlates, usually referred as socio-economic status (SES), affect the physical activity level of the children (Finger et.al 2014; Biddle et al., 2011; Lämmle et al., 2012). Some studies, for example Mutz and Albrecht (2017) have investigated an association between SES and different physical activity intensity, and found an association between SES and moderate-to-vigorous intensity activity while others have discovered an association between SES and overall fitness of children (Freitas et al. 2007; Finger et al. 2014). However, results from this field have been somewhat mixed, and this is because of different study methods and settings used. In this study, activity level was investigated with number of hobbies and hours the child spent on organized or recreational physical activities, and because of this, results cannot be fully compared. Nevertheless, results are in line with previous research results and they brought a new perspective for this issue.

Hypothesis 1 got confirmation. It was found that children of the male respondent had more hobbies, did more organized sports, and did more team sports than children of the female respondent. Furthermore, education level was partly associated with number of hobbies, specifically that the child whose parent had a comprehensive school education had fewer sport hobbies than the child whose parent had higher level education, i.e. lower level of education was associated with fewer sport hobbies. In addition, the higher family's income level was, the more hobbies the child had. When testing residential area's association, it was found that children living in a countryside had more hobbies than children living in a small or medium sized town or municipality, and children living in a large town had more hobbies than children living in a small or medium sized town or municipality. However, this result was not statistically significant. Parental status was not associated with number of hobbies, and this result is in line with a study made by Biddle et al. (2011), while at the same time it is in partially contrast with a study made by Toftegaard-Støckel et al. (2011) and (Gustafson & Rhodes, 2006).

Hypothesis 2 was partly confirmed. Results revealed that education level of the parent was associated with organized sport participation but not with recreational physical activity. Specifically, children whose parent had comprehensive school education spent less hours on organized sports, and children whose parent had education from the university of applied sciences spent more hours both on organized sports and recreational physical activities than

children whose parent had university education. These children whose parents had an education from the university of applied sciences were the most active group. In addition, it was found that the higher an income level in the family was, the more hours the child spent on organized sport activities. No statistically significant association was found between residential area and child's organized or recreational physical activity, however, the means indicated that children living in a large town spent more time on organized sports than recreational physical activities, and children living in a small or medium sized town or countryside spent more time on recreational physical activities than organized sports.

Hypothesis 3 was not fully supported. It was found that income level of the family, education level of the parent, and residential area were not associated with child's team or individual sport participation. However, based on means, the results proposed that children living in a large town practiced more team sports and children living in a smaller town or countryside practiced more individual sports. The strongest confirmation for the hypothesis was found when parental status was investigated. Children whose parent had joint custody did more team sports than other children, and children who had a single parent did more individual sports than other children.

The second research question and hypothesis were

2. How do parents involve in their children's sport hobbies?

H4: Socio-demographic factors relate with the level of parental support

Parental support has been proven to influence children's physical activity, both in the early years (Carson, 2016), and during adolescence (Biddle et al., 2011). However, the effect direction (direct or indirect), and which form of parental support affects the most, are not fully clear. One study found a moderate effect between encouragement and child's physical activity (Yao & Rhodes, 2015), while Brown et al. (2017) found that greater social support from parents (e.g. co-participation, and facilitation) was related to greater odds at meeting with the physical activity guidelines than other form of parental support. Pugliese and Tinsley (2007) found that role modeling had the weakest relation to physical activity whereas encouragement and

instrumental behavior were found to be significantly related to physical activity of children. While previous research has focused on which form of parental support affect children's physical activity and how, this study studied how parental support differs between male and female parents.

When parental support was investigated, hypothesis 4 got confirmation. It was found that mothers were more involved in their child's physical activities than fathers. Particularly, mothers were more encouraging, payed more costs, did more cooking and laundry, exercised more with a child, and followed child's physical activities more than fathers. In addition, parents who had comprehensive school education participated less in their child's hobbies than those parents who had higher education. Furthermore, those parents whose income level in a year was over 70.000 euros payed costs more and participated more on volunteer tasks than those parents who earned less. When parental status was checked, children whose both parents lived with the child/children experienced more parental support than children whose parents had joint custody, and children whose parents had a joint custody experienced more parental support than children whose parent was a single parent, especially in the areas of encouragement, paying the costs, cooking, doing laundry, and following child's physical activities. To this date, this might have been the first attempt to study, how different socio-demographic factors of the parent affect the level of parental support.

Third research question and hypothesis were:

3. How does parent's physical activity level correlate child's physical activity level?

H5: There is positive correlation between parent's own physical activity level and child's physical activity level

Role modeling, meaning parent's own physical activity level, and its association with child's physical activity have been researched quite heavily. However, the research evidence of this association is still mixed. Nevertheless, there seem to be a shared presumption that active parents have active children (Biddle et al., 2011). Factors that might affect this correlation are

age of the child, gender of the child, gender of the parent, activity level of the parent, and intensity level of physical activities.

In this study, hypothesis 5 was confirmed. A small positive correlation was found between parents' physical activity and children's recreational physical activity, and this is in line with the study made by Gustafson and Rhodes (2006), Schoeppe et al. (2016), and Stearns et al. (2016). More precisely a positive correlation was found between father's physical activity and child's recreational physical activity, which is in line with a study made by Bakalár et al. (2019). However, no statistically significant correlation was found between father's physical activity and child's organized physical activity. In addition, no correlation was found between mother's physical activity and child's organized or recreational physical activity which is in contrast with the results of Yang et al. (1996), Seabra et al. (2011) and Moore et al. (1991).

Besides, a small positive correlation was found between income level of the family and child's overall physical activity. To be precise children from higher income families (gross income in a year over 70.000 euros) did more physical activities, both organized and recreational than children from lower income families. Overall, results indicated that children from higher socio-economic status families spent more time on physical activities than children from lower socio-economic status. Similar findings were discovered in the studies made by Freitas et al. (2007), Lämmle et al. (2012), and Jiménez-Pavón et al. (2012).

Interestingly, strong correlation was found between older sibling's and younger sibling's physical activity, and this correlation was stronger than paternal correlation. This result was in line with the study made by Liu et al. (2014) who found that older sibling's influence on younger sibling's physical activity was stronger than parent's level of activity. It could be stated that siblings may have stronger influence on other sibling's physical activity level than parents have, and this should be taken into account when planning new intervention programs for children.

Fourth research question and hypotheses were:

4. How do age and gender of the child relate with child's own physical activity level?



H6: Boys are more active than girls

H7: Activity level decreases with age

Previous research have identified that boys are more active than girls, and that physical activity levels drop when children get older, especially when they are moving from childhood into adolescence (Sallis et al. 2000; Biddle et al., 2011; Mitchell et al., 2016; Bakalár et al., 2019). In this study, these views were supported and hypothesis six and seven got support. Results revealed that boys had more hobbies than girls. Further investigations revealed that boys spent more hours on organized sports compared to girls while girls spent more hours on recreational physical activities compared to boys. Additionally, it was found that boys participated more in team sports and girls did more individual sports.

However, these study results are not directly comparable to previous research knowledge since activity level was divided into recreational and organized physical activity, and activity level was measured with number of hobbies and hours spent on organized and recreational physical activities. Physical activity was not based on intensities like in other previous studies, but this study might have been the first to investigate physical activity with number of hobbies, and whether a child is practicing individual/team sports, and organized vs. recreational physical activities.

In addition, and activity level was found to drop when children moved from childhood into adolescence and this was in line with the previous findings. Results showed that older children had fewer sport hobbies than younger children even though the result was not statistically significant. Especially, results proposed that children aged 7–12 had more hobbies than under school-aged children, and adolescents aged 13–19. Furthermore, it was tested whether age of the child affected team or individual sport participation, and results showed no association between these variables. An association was found between age and organized/recreational physical activity, specifically adolescents did more organized sports than under school-aged children. No association was found between age groups and recreational physical activity.

The most practiced sport disciplines differed between boys and girls, but the reasons for practicing were somewhat similar. Top five sport disciplines for boys were football, floorball,

cycling, swimming, walking, and ice hockey. Top five for girls were dancing, horse riding, gymnastics, cheerleading, and swimming. Interestingly, swimming was the only sport discipline that fit the top five for both boys and girls. When comparing children's most practiced sport disciplines to parents' most practiced disciplines, a difference can be seen. Parents did more traditional, individual sport disciplines, such as running, track & field, and cross-country skiing, whereas children did more team sports. Only football and floorball were the only team sport disciplines that were in the top ten among parents. An interesting notion is also that football and floorball were also the top sport disciplines among boys, and this might explain the paternal influence. A main reason for practicing specific sport discipline for both girls and boys was child's own motivation. The second most mentioned reason for boys was sport fits child's capabilities, and for girls it was easy accessibility. The third most mentioned reason for boys was father's sport background affected/directed the decision, and for girls it was sport fits child's capabilities.

Physical activity level of the children was checked by comparing results of hours spent on organized physical activities and hours spent on recreational physical activities per week. Boys spent more time on organized sports than girls, and girls spent more time on recreational physical activities than boys. Overall, slightly over third of the children participated both in organized and recreational physical activities 1–2 hours per week. Of the children, 10.5 percent did not spend any time in organized sports on a weekly basis, and 9.6 percent did not participate in recreational physical activities per week. However, it cannot be said that same children were part of both groups. Adolescents aged 13–19 were the most active group in practicing organized sports but also the least active (6.6 % did not participate at all on a weekly basis).

These results should be compared with the physical activity guidelines made for school-aged and under school-aged children. For school-aged children the recommendation is at least 60 minutes of daily physical activity, and activities strengthening muscles at least three times a week. For under school-aged children the recommendation was minimum of three hours of physical activity per day. Majority of these children were doing organized sports and recreational physical activities 1–2 or 3–4 hours per week. When calculating these together, children were physically active 2–8 hours per week. Based on this, it can be questioned whether these children met the physical activity guideline. It can be argued that some children did not

even meet the minimum guideline set for them, especially the children aged six or under. At the same time, there were children who were truly active, and these results slightly support the fact that activity level of children is polarized in Finland – some are truly active, when others struggle to meet the minimum guidelines.

Other interesting finding was that 40 percent of the children covered in this study had quit an organized sport hobby. This percentage is higher than the result of the Physical activity behavior of the Finnish children and adolescents -study (2018). The most mentioned reason for quitting was a lack of child's own motivation. The next most mentioned reasons were high costs and quality of coaching. Approximately a third of the children had quit an organized sport hobby because of the quality of coaching, behavior of the coach, or because of high costs. It is noteworthy to point out that 20.4 percent mentioned that their child had quit an organized sport hobby because of coaching issues. There has been public discussion considering unethical coaching behavior and high costs of sport hobbies in Finland. Keeping the public debate in mind, it is quite concerning that a third of those children who had quit organized sport hobby in this study had quit because of coaching issues or the costs. It could be argued that this percentage is too high.

When it was asked how much money respondents spent on his/her children's sport hobbies per month, the majority was using 0–50 euros and this includes all the costs for all the children monthly. About 40 percent responded that the costs were reasonable while a fourth responded that the costs of hobbies are rather or too expensive. If we consider that sport and physical activity is important for both individuals and societies, it can be questioned whether the costs of sport hobbies should be even lower than they are now. Thus, policymakers should ponder seriously, how physical activities are equally accessible to all the children, no matter what their socio-economic background is.

This study attempted to provide new insights for the research field related to physical activity behavior of children. This might have been the first attempt to investigate children's physical activity behavior from parental point of view, at least in Finland. Besides, new measures of activity level have been put forward. Because the study design and measures differed from

previous research made, results cannot be fully compared. However, for the most part, these study results were in line with previous research made.

## **6.2 Reliability, validity, and limitations of the study**

The quality of the study depends on the question design and questionnaire formation. According to Bourke et al. (2016) reliability of the study means that the questions are transparent, easily understood, and answers are consistent meaning that similar answers should be received if different persons answer the questions. Authors stated that reliability can be tested by retesting (getting two sets of answers with the same questionnaire) and checking response consistency, especially if there were alternative forms of the same questions. Bourke et al. (2016) explained that validity of the research means the questions are measuring what they are intended to measure, and validity can be measured with four different measures: content validity (how the topic domain is covered), face validity (layout of the questionnaire), criterion validity (what the questions should measure), and construct validity (reflecting relationship).

In this study process, the questionnaire was pre-tested before the actual data collection started so that major errors could be identified, and modifications could be made. Respondents for the test were randomly selected from the same Dynata pool as what was used in the actual study. Besides, respondents randomly selected for the test were different persons than those who were finally included in the study. The test lasted for a week, and no major errors were found, so the questionnaire was published as it was. Pre-testing and respondents' voluntary participation enhanced the reliability of the study. In addition, questions were optional which also reflects reliability. From validity point of view, the questionnaire was rather comprehensive and covered many different aspects of the topic. It could be argued that questions measured what they were supposed to measure since the answers were rather consistent, and they were in line with previous research results.

There were some limitations that affected the reliability of the study. First, it could be argued whether the respondent understood the questions correctly, for example what was meant by recreational and organized physical activity. Hereby, the answers were based on parents'

subjective viewpoints and for this reason, answers could have been over or under estimations. Secondly, the questionnaire did not follow the formation or validity of the previous studies made but it was formatted for this study purpose. Thirdly, the sample was not big enough to investigate in more detail, how different correlates were associated with single sport discipline.

In addition, the respondents were asked to consider only the oldest/the only child, and the second oldest child. Besides, the respondents were asked to answer only the two most practiced sport discipline per child. These limitations may have affected the data and important information might have been lost. However, these limitation were made because otherwise the response time would have been too long for the respondent and the risk for drop out would have increased. Furthermore, questions were closed-ended so therefore some important data could have been missed, for example, we cannot tell what “other” sport discipline contained. Besides, the data was cross-sectional so no comprehensive and straightforward estimations about the causality could be made.

This study was more data driven than theory driven. This is a negative issue since the results cannot be fully generalized and compared to previous research. Besides, it should be questioned whether the questionnaire was too broad, and whether it should have focused on narrower issues, for example on investigating only organized or recreational sport participation. If I would have a chance to start from the beginning, I would have chosen one study design and test it with my respondent group.

### **6.3 Ideas for future research**

There has been a long need for longitudinal studies regarding correlates affecting children’s physical activity. Since there exists inconsistent results related to parental modeling, it would be interesting to survey this matter in more detail. Especially interesting would be to investigate if there is an association between different sport disciplines that both the parents and the children practice. For example, in this study football and floorball was in the top ten of both parents and children. An interesting topic would be to investigate, why these children are truly practicing football or floorball. Is it because of parental influence, sibling influence, or peer

influence or for some other reason? Furthermore, this could be investigated by gender to see if there is association between same the gender pairs (ie.g. father-son, and mother-daughter). At first, one purpose of this current study was to investigate this, but unfortunately the sample size was not large enough to draw reliable conclusions.

One limitation of this current study was a sample size. More detailed information could have been gotten if the sample size would have been bigger. A study period should have been longer, but the problem was that the costs of the study would have increased too much, and the time frame for the study would have stretch too long. If the data would have been larger, correlations between different parental correlates and specific sport disciplines could have been studied. Besides, motives for sport participation could have been investigated in more detail with bigger sample size. These would be interesting to investigate further since it would be beneficial for different sport associations to understand, why children are engaged in their sport and what makes their sport unique compared to other disciplines.

One interesting finding in this study was that older siblings influenced younger siblings' physical activity level more than parents did. Comparing parental influence and sibling influence among different genders and age groups could bring new insight for this matter and could be beneficial for the sport community when planning interventions. Furthermore, this influence could be investigated in the organized sport settings as well as recreational sport settings.

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## APPENDICES

### Appendix 1. Questionnaire

#### **Ikäsi?**

Kirjoita kenttään ikäsi

#### **Sukupuoli**

Nainen (2)

Mies (1)

#### **Mikä seuraavista luonnehdinnoista kuvaa parhaiten asuinympäristöänne?**

Suuri kaupunki (yli 100 000 asukasta) (1)

Suuren kaupungin lähiö tai lähiseutu (suuren kaupungin vaikutusalueella / työssäkäyntialueella) (2)

Pieni tai keskikokoinen kaupunki tai kunta (20 000-100 000 as.) (3)

Pienempi taajama tai kunta (alle 20 000 asukasta) (4)

Maaseutu (haja-asutusalue) (5)

#### **Koulutuksesi?**

Peruskoulu (1)

Lukio (2)

Ylioppilas (3)

Ammattikoulu (4)

Opistotaso (5)

Ammattikorkeakoulu (6)

Alempi Korkeakoulututkinto (7)

Ylempi Korkeakoulututkinto (8)

Ei mikään näistä/En halua vastata (9)

**Taloutesi yhteenlasketut vuositulot veroja vähentämättä?**

*Yksi vastaus*

Alle 10 001 e/vuosi (1)

10 001 - 20 000 e/vuosi (2)

20 001 - 30 000 e/vuosi (3)

30 001 - 40 000 e/vuosi (4)

40 001 - 50 000 e/vuosi (5)

50 001 - 60 000 e/vuosi (6)

60 001 - 70 000 e/vuosi (7)

70 001 - 80 000 e/vuosi (8)

80 001 - 100 000 e/vuosi (9)

Yli 100 000 e/vuosi (10)

En halua vastata (11)

**Kuinka monta alle 20-vuotiasta lasta sinulla on?**

1 (1)

2 (2)

3 tai enemmän (3)

Ei yhtäkään (99)

**Mikä seuraavista kuvaa tilannettasi parhaiten?**

Molemmat vanhemmat asuvat lapsen/lapsien kanssa (1)

Minulla on jaettu huoltajuus ja lapsi asuu kanssani pysyvästi (2)

Minulla on jaettu huoltajuus mutta lapsi ei asu kanssani pysyvästi (3)

Olen yksinhuoltaja (4)

En halua vastata (99)

**Kuinka monta autoa perheessä on?**

1 (1)

2 (2)

Enemmän kuin 2 (3)

Perheessä ei ole autoa (99)

**Seuraavat kysymykset koskevat lapsesi urheilu- ja liikuntaharrastuksia.**

**Jos sinulla on useampia lapsia vastaa seuraavaksi vanhimman alle 20-vuotiaan lapsesi osalta.**

**Lapsen sukupuoli**

Tyttö (1)

Poika (2)

**Lapsen ikä**

Alle 5 (1)

5-6 (2)

7-8 (3)

9-10 (4)

11-12 (5)

13-14 (6)

15-16 (7)

17-19 (8)

**Harrastaako lapsesi jotain liikuntaa omatoimisesti tai ohjatusti?**

Kyllä (1)

Ei (2)

**Kuinka monta eri liikuntaharrastusta lapsella on?**

1 (1)

2 (2)

3 (3)

4 (4)

5 (5)

Enemmän kuin 5 (6)

**Harrastaako lapsesi liikuntaa...? Voit valita useamman vaihtoehdon**

Urheiluseurassa (1)

Omatoimisesti omalla ajalla (2)

Koulussa (3)

Ulkona / luonnossa kavereiden kanssa (4)

Muulla tavalla (5)

**Harrastaako lapsesi liikuntaa...?**

kilpaillakseen ja tavoitellakseen menestystä (1)

harrastamisen ja kavereiden vuoksi (2)

**Mitä kaikkia lajeja lapsesi harrastaa? Valitse maks. 2 eniten harrastettua.**

Jääkiekko (1)

Jalkapallo (2)

Koripallo (3)

Salibandy (4)

Lentopallo (5)

Pesäpallo (6)

Yleisurheilu (7)

Maastohiihto (8)

E-urheilu (9)

Moottoriturheilu (esim. karting, enduro) (10)

Taitoluistelu (11)

Muodostelmaluistelu (12)

Voimistelu (esim. teline-, rytminen, trampoliinivoimistelu) (13)

Alppihiihto (14)

Tennis (15)

Uinti (16)

Tanssi (17)

Baletti (18)

Paini (19)

Lumilautailu (20)

Pyöräily (21)

Suunnistus (22)

Kamppailulajit (esim. nyrkkeily, taekwondo, judo, karate jne.) (23)

Ratsastus (24)

Golf (25)

Cheerleading (26)

Kuntosaliharjoittelu / Fitness (27)

Jooga / pilates (28)

Ryhmäliikuntatunnit (esim. Les Mills -tunnit) (29)

Juoksulenkkeily (30)

Kävelylenkkeily (31)

Agility (32)

Muu (33)

**Minkä ikäisenä lapsesi aloitti ensimmäisen lajin harrastamisen?**

Alle 5 (1)

5-6 (2)

7-8 (3)

9-10 (4)

11-12 (5)

13-14 (6)

15-16 (7)

17-19 (8)

**Kuinka monta tuntia viikossa lapsi harrastaa liikuntaa ohjatusti?**

0 (1)

1-2 (2)

3-4 (3)

5-7 (4)

8-10 (5)

Yli 10 (6)

**Kuinka monta tuntia viikossa lapsi harrastaa liikuntaa omatoimisesti / omaehtoisesti?**

0 (1)

1-2 (2)

3-4 (3)

5-7 (4)

8-10 (5)

Yli 10 (6)

**Miten lapsi kulkee harrastuksiin? Voit valita useamman.**

Vanhemmat vievät autolla (1)

Isovanhemmat / muut sukulaiset vievät autolla (2)

Lapsen kaverien vanhemmat vievät autolla (3)

Lapsi käyttää julkista liikennettä (4)

Lapsi kävelee / pyöräilee (5)

Lapsi kulkee mopolla / mopautolla (6)

**Kerroit, että lapsi harrastaa \_\_\_\_\_ lajia. Miten lapsi päätyi kyseiseen lajiin? Valitse seuraavista 1-3 tärkeintä syytä**

- Äidin lajitausta vaikutti päätökseen / ohjasi lajin pariin (1)
- Isän lajitausta vaikutti päätökseen / ohjasi lajin pariin (2)
- Isovanhempien lajitausta vaikutti päätökseen / ohjasi lajin pariin (3)
- Sisarusten lajitausta vaikutti päätökseen / ohjasi lajin pariin (4)
- Lapsen kaverit harrastavat samaa lajia ja lapsi halusi mennä kavereiden perässä (5)
- Toimin lajin parissa valmentajana (6)
- Toimin joukkueenjohtajana / huoltajana / rahastonhoitajana (7)
- Lapsen oma motivaatio lajia kohtaan (8)
- Laji opettaa tärkeitä fyysisiä taitoja (9)
- Laji opettaa tärkeitä sosiaalisia taitoja (10)
- Harrastuspaikat ovat lähellä ja helposti saavutettavissa (11)
- Lajin kustannukset ovat alhaiset (12)
- Lajin imago on hyvä (13)
- Laji sopii lapsen kyvyille (14)
- Alueella / lähellä kotia ei ollut tarjolla muita lajivaihtoehtoja (15)
- Taloudellisesti ei ollut muita vaihtoehtoja (16)
- Lajin idolit / esikuvat synnyttivät lapsen kiinnostuksen lajia kohtaan (17)
- Vanhemman idolit / esikuvat synnyttivät kiinnostuksen lajia kohtaan (18)
- Muu syy (19)

**Kerro halutessasi tarkemmin, mikä sai lapsesi aloittamaan harrastuksen.**

**Onko lapsesi lopettanut ohjatun liikuntaharrastuksen esim. seurassa?**

- Kyllä (1)
- Ei (2)

**Miksi lapsesi lopetti?**

- Harrastuksen kustannukset kohosivat liikaa (1)
- Lapsen motivaatio lajia kohtaan loppui (2)
- Lapsen kaverit lopettivat saman harrastuksen (3)
- Terveydelliset syyt pakottivat lopettamaan (4)
- Ajanpuute (5)
- Valmennuksen taso (6)
- Valmentajan käytös (7)
- Muu syy (8)



**Miten usein lapsesi pelaa mobiili-, PC- tai konsolipelejä?**

Useamman kerran päivässä (1)

4-5 kertaa viikossa (2)

2-3 kertaa viikossa (3)

Muutaman kerran kuukaudessa (4)

Ei ollenkaan (5)

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**Seuraavat kysymykset koskevat lapsesi / lapsiesi urheilu- ja liikuntaharrastuksia.**

**Vastaa seuraavaksi toiseksi vanhimman alle 20-vuotiaan lapsesi osalta.**

**Lapsen sukupuoli**

Tyttö (1)

Poika (2)

**Lapsen ikä**

Alle 5 (1)

5-6 (2)

7-8 (3)

9-10 (4)

11-12 (5)

13-14 (6)

15-16 (7)

17-19 (8)

**Harrastaako lapsesi jotain liikuntaa omatoimisesti tai ohjatusti?**

Kyllä (1)

Ei (2)

**Kuinka monta eri liikuntaharrastusta lapsella on?**

1 (1)

2 (2)

3 (3)

4 (4)

5 (5)

Enemmän kuin 5 (6)

**Harrastaako lapsesi liikuntaa...? Voit valita useamman vaihtoehdon**

Urheiluseurassa (1)

Omatomaisesti omalla ajalla (2)

Koulussa (3)

Ulkona / luonnossa kavereiden kanssa (4)

Muulla tavalla (5)

**Harrastaako lapsesi liikuntaa...?**

kilpaillakseen ja tavoitellakseen menestystä (1)

harrastamisen ja kavereiden vuoksi (2)

**Mitä kaikkia lajeja lapsesi harrastaa? Valitse maks. 2 eniten harrastettua.**

Jääkiekko (1)

Jalkapallo (2)

Koripallo (3)

Salibandy (4)

Lentopallo (5)

Pesäpallo (6)

Yleisurheilu (7)

Maastohiihto (8)

E-urheilu (9)

Moottoriurheilu (esim. karting, enduro) (10)

Taitoluistelu (11)

Muodostelmaluistelu (12)

Voimistelu (esim. teline-, rytminen, trampoliinivoimistelu) (13)

Alppihiihto (14)

Tennis (15)

Uinti (16)

Tanssi (17)

Baletti (18)

Paini (19)

Lumilautailu (20)

Pyöräily (21)

Suunnistus (22)

Kamppailulajit (esim. nyrkkeily, taekwondo, judo, karate jne.) (23)

Ratsastus (24)

Golf (25)

Cheerleading (26)

Kuntosaliharjoittelu / Fitness (27)

Jooga / pilates (28)

Ryhmäliikuntatunnit (esim. Les Mills -tunnit) (29)

Juoksulenkkeily (30)

Kävelylenkkeily (31)

Agility (32)

Muu (33)

**Minkä ikäisenä lapsesi aloitti ensimmäisen lajin harrastamisen?**

Alle 5 (1)

5-6 (2)

7-8 (3)

9-10 (4)

11-12 (5)

13-14 (6)

15-16 (7)

17-19 (8)

**Kuinka monta tuntia viikossa lapsi harrastaa liikuntaa ohjatusti?**

0 (1)

1-2 (2)

3-4 (3)

5-7 (4)

8-10 (5)

Yli 10 (6)

**Kuinka monta tuntia viikossa lapsi harrastaa liikuntaa omatoimisesti / omaehtoisesti?**

0 (1)

1-2 (2)

3-4 (3)

5-7 (4)

8-10 (5)

Yli 10 (6)

**Miten lapsi kulkee harrastuksiin? Voit valita useamman.**

Vanhemmat vievät autolla (1)

Isovanhemmat / muut sukulaiset vievät autolla (2)

Lapsen kaverien vanhemmat vievät autolla (3)

Lapsi käyttää julkista liikennettä (4)

Lapsi kävelee / pyöräilee (5)

Lapsi kulkee mopolla / mopoputolla (6)

**Kerroit, että lapsi harrastaa XXX lajia. Miten lapsi päätyi kyseiseen lajiin? Valitse seuraavista 1-3 tärkeintä syytä**

Äidin lajitausta vaikutti päätökseen / ohjasi lajin pariin (1)

Isän lajitausta vaikutti päätökseen / ohjasi lajin pariin (2)

Isovanhempien lajitausta vaikutti päätökseen / ohjasi lajin pariin (3)

Sisarusten lajitausta vaikutti päätökseen / ohjasi lajin pariin (4)

Lapsen kaverit harrastavat samaa lajia ja lapsi halusi mennä kavereiden perässä (5)

Toimin lajin parissa valmentajana (6)

Toimin joukkueenjohtajana / huoltajana / rahastonhoitajana (7)

Lapsen oma motivaatio lajia kohtaan (8)

Laji opettaa tärkeitä fyysisiä taitoja (9)

Laji opettaa tärkeitä sosiaalisia taitoja (10)

Harrastuspaikat ovat lähellä ja helposti saavutettavissa (11)

Lajin kustannukset ovat alhaiset (12)

Lajin imago on hyvä (13)

Laji sopii lapsen kyvyille (14)

Alueella / lähellä kotia ei ollut tarjolla muita lajivaihtoehtoja (15)

Taloudellisesti ei ollut muita vaihtoehtoja (16)

Lajin idolit / esikuvat synnyttivät lapsen kiinnostuksen lajia kohtaan (17)

Vanhemman idolit / esikuvat synnyttivät kiinnostuksen lajia kohtaan (18)

Muu syy (19)

**Kerro halutessasi tarkemmin, mikä sai lapsesi aloittamaan harrastuksen.**

**Onko lapsesi lopettanut ohjatun liikuntaharrastuksen esim. seurassa?**

Kyllä (1)

Ei (2)

**Miksi lapsesi lopetti?**

Harrastuksen kustannukset kohosivat liikaa (1)

Lapsen motivaatio lajia kohtaan loppui (2)

Lapsen kaverit lopettivat saman harrastuksen (3)

Terveydelliset syyt pakottivat lopettamaan (4)

Ajanpuute (5)

Valmennuksen taso (6)

Valmentajan käytös (7)

Muu syy (8)

En halua vastata (99)

**Miten usein lapsesi pelaa mobiili-, PC- tai konsolipelejä?**

Useamman kerran päivässä (1)

4-5 kertaa viikossa (2)

2-3 kertaa viikossa (3)

Muutaman kerran kuukaudessa (4)

Ei ollenkaan (5)

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**Miten osallistut lastesi liikuntaharrastuksiin? Voit valita useamman vaihtoehdon.**

Kuljetan harjoituksiin (2)

Kuljetan peleihin / kilpailuihin (3)

Kannustan (4)

Kustannan (lajimaksut, välineet yms.) (5)

Toimin joukkueen/seuran joukkueenjohtajana/huoltajana/rahastonhoitajana (6)

Toimin joukkueessa/seurassa muussa vapaaehtoisroolissa (7)

Seuraan lapseni liikkumista vierestä / katsomosta (8)

Pesen pyykit (9)

Teen ruokaa (10)

Liikun yhdessä lapseni kanssa (11)

En osallistu mitenkään (99)

**Kuinka paljon käytät / taloutesi käyttää rahaa lastesi liikuntaharrastuksiin kuukausittain?**

- 0-50 euroa (1)
- 51-150 euroa (2)
- 151-250 euroa (3)
- 251-350 euroa (4)
- 351-450 euroa (5)
- 451-550 euroa (6)
- 551-650 (7)
- 651-750 (8)
- 751-850 (9)
- 851-999 (10)
- Yli 1000 euroa (11)

**Koetko, että lastesi liikuntaharrastusten kuukausittaiset kustannukset ovat...?**

- Liian kalliit (1)
- Melko kalliit (2)
- Sopivat (3)
- Melko edulliset (4)
- Liian edulliset (5)
- En osaa sanoa (6)

**Mitä liikuntalajeja harrastat / olet harrastanut itse?**

- Jääkiekko (1)
- Jalkapallo (2)
- Koripallo (3)
- Salibandy (4)
- Lentopallo (5)
- Pesäpallo (6)
- Yleisurheilu (7)
- Maastohiihto (8)
- E-urheilu (9)
- Moottoriurheilu (esim. karting, enduro) (10)
- Taitoluistelu (11)
- Muodostelmaluistelu (12)
- Voimistelu (13)
- Alppihiihto (14)
- Tennis (15)
- Uinti (16)

Tanssi (17)  
Baletti (18)  
Paini (19)  
Lumilautailu (20)  
Pyöräily (21)  
Suunnistus (22)  
Kamppailulajit (esim. nyrkkeily, taekwondo, judo, karate jne.) (23)  
Ratsastus (24)  
Golf (25)  
Cheerleading (26)  
Kuntosaliharjoittelu / Fitness (27)  
Jooga / pilates (28)  
Ryhmäliikuntatunnit (esim. Les Mills -tunnit) (29)  
Juoksulenkkeily (30)  
Kävelylenkkeily (31)  
Agility (32)  
Muu (33)  
En mitään (34)

**Kuinka monta kertaa viikossa harrastat liikuntaa yhteensä (ohjatusti / omatoimisesti)?**

0 (1)  
1-2 (2)  
3-4 (3)  
5-7 (4)  
8-10 (5)  
Yli 10 (6)

**Kuinka monta tuntia viikossa harrastat liikuntaa yhteensä (ohjatusti / omatoimisesti)?**

0 (1)  
1-2 (2)  
3-4 (3)  
5-7 (4)  
8-10 (5)  
Yli 10 (6)