

**THE ASSOCIATIONS OF PARENT-CHILD NATURE VISITS AND FAMILY
PHYSICAL ACTIVITY WITH PARENTAL HAPPINESS: A CROSS-SECTIONAL
STUDY IN SOUTHERN FINLAND.**

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TIIVISTELMÄ

Niemi, H. 2024. Vanhemman ja lapsen luontovierailuiden, sekä perheliikunnan yhteys vanhemman onnellisuuteen: Etelä-Suomessa toteutettu poikkileikkaustutkimus. Liikuntatieteellinen tiedekunta, Jyväskylän yliopisto, pro gradu -tutkielma, 60 s., 4 liitettä.

Onnellisuus on monelle yksi suurimmista tavoitteista elämässä. Onnellisuus liitetään parempaan fyysiseen, psyykkiseen ja sosiaaliseen hyvinvointiin, sekä terveyteen. Luonto tarjoaa mahdollisuuden keholle ja mielelle palautua arjen kiireestä ja paineista. Vaikka onnellisuus tarkoittaa eri asioita eri ihmisille, tuo se terveyttä ja hyvinvointia kaikille. Koska luonnolla näyttää olevan huomattava vaikutus onnellisuuteen, tulisi perhelähtöisessä toiminnassa luonnossa vietettyä aikaa korostaa jo varhaisesta iästä alkaen. Tässä pro gradu -tutkielmassa tarkastellaan ensisijaisesti vanhemman ja lapsen luontovierailujen ja vanhempien onnellisuuden välistä yhteyttä. Toissijaisesti tutkitaan vanhemman ja lapsen tai koko perheen kanssa yhdessä toteutetun liikunnan välistä yhteyttä vanhempien onnellisuuteen, sekä elinympäristön (kaupunki vs. maaseutu) ja perheen luontovierailujen välistä yhteyttä. Tarkastelun kohteena on myös mahdolliset sukupuolten väliset erot luontovierailujen ja perheen kanssa toteutetun liikunnan määrässä.

Tutkielmassa käytetty tutkimusaineisto on SUNRISE Helsinki -poikkileikkaustutkimuksesta. Tässä tutkimuksessa tarkasteltiin Helsingissä ja Helsingin läheisillä maaseutualueilla asuvaa 183 vanhempaa ja heidän 3-4-vuotiaita lapsiaan. Vanhemmat raportoivat kyselylomakkeella onnellisuudestaan, luontovierailuista yhdessä lapsen kanssa ja yhteisestä liikunnasta lapsen tai koko perheen kanssa. Tutkimusaineisto analysoitiin Spearmanin korrelaatiota, sekä kaksisuuntaista varianssianalyysiä hyödyntäen. Lisäksi ristiintaulukointia ja khiin neliötestiä hyödynnettiin elinympäristön (kaupunki vs. maaseutu) ja perheen luontovierailujen välisen yhteyden tutkimiseen.

Vanhemman ja lasten luontovierailujen ja vanhemman kokeman onnellisuuden välillä oli positiivinen yhteys. Yhteys useampien luontovierailujen ja erityisesti äidin kokeman onnellisuuden väliltä löydettiin. Samaa positiivista yhteyttä ei perheen yhteisen liikunnan ja vanhemman kokeman onnellisuuden kohdalla löydetty. Myöskään kaupungissa tai maaseudulla asuvien välillä ei luontovierailuissa havaittu merkitseviä eroja.

Lapsuuden luontovierailut voivat muodostua tavaksi, joka jatkuu pitkälle aikuisuuteen. Tämän pro gradun tutkimustulokset viittaavat siihen, että lapsen kanssa vietettyjen luontovierailujen määrä on yhteydessä vanhemman korkeampaan onnellisuuteen. Tämä voi tarkoittaa, että luontovierailut lapsen kanssa lisäävät vanhemman onnellisuutta ja/ tai vanhemman kokema onnellisuus lisää luontovierailujen määrää. Vanhemman ja lapsen yhteisiä luontovierailuja tulisi korostaa perheille suunnatuissa terveydenedistämiprojekteissa. Lisää tutkimuksia aiheesta kuitenkin tarvitaan, jotta luonnon ja onnellisuuden välisiä yhteyksiä pystytään paremmin ymmärtämään.

Asiasanat: Onnellisuus, hyvinvointi, luontovierailut, luonto, liikunta, perheliikunta

ABSTRACT

Niemi, H. 2024. The associations of parent-child nature visits and family physical activity with parental happiness: a cross-sectional study in Southern Finland. Faculty of Sport and Health Sciences, University of Jyväskylä, Master's thesis, 60 pp., 4 appendices.

For many, happiness is one of the biggest goals in life. The relationship between happiness and better physical, psychological, and social wellbeing and health has been recognised. Nature offers an opportunity for the body and mind to recover from the rush and pressures of everyday life. Although happiness can be a variety of different things to people, it brings health and wellbeing to everyone. Since nature seems to have a remarkable effect on happiness, spending time in nature in family-oriented activities should be emphasised from an early age. In this master's thesis, primarily the associations between parent-child nature visits and parents' happiness are examined. Secondly, the associations between parent-child or whole family physical activity and parents' happiness, and the connection between the living environment (urban vs. rural) and the family's visits to nature are investigated. Possible differences between sexes in the frequency of parent-child nature visits and physical activity with the family are also examined.

The research material used in the master thesis is from the cross-sectional SUNRISE Helsinki study. This study examined 183 parents and their 3-4-year-old children living in Helsinki and the surrounding rural areas in Southern Finland. The parents filled in a questionnaire about their happiness, nature visits with the child and exercise with the child or the whole family. Research data was analysed using Spearman's correlation and two-way ANOVA. In addition, Cross-tabulation and Chi-square tests were used to examine the association between living environment (urban vs. rural) and family nature visits.

A positive association was found between parent-child nature visits and parent's happiness. A connection between more regular nature visits and especially the happiness experienced by the mother was found. The same positive association was not found between family physical activity and parent's happiness. Also, no differences were observed in nature visits between participants living in urban or rural areas.

Childhood visits to nature can become a habit that continues into adulthood. The research results of this master's thesis suggest that the number of parent-child nature visits is associated with parents' higher happiness. This may indicate that the number of nature visits of parent-child increases the parents' happiness and/or the parent's happiness increases the parent-child nature visits. Parent and child visits to nature together should be emphasised in health promotion projects aimed at families. However, more studies on the topic are needed to better understand the associations between nature and happiness.

Keywords: Happiness, wellbeing, nature visits, nature, exercise, family exercise

ABBREVIATIONS USED

ECEC	early childhood education and care
NC	nature connectedness
NOE	natural outdoor environment
MVPA	moderate-to-vigorous physical activity
PA	physical activity
SWB	subjective wellbeing
SHS	subjective happiness scale

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1 INTRODUCTION

Many people indicate happiness as the most significant goal in their lives (Diener & Seligman 2004; Zhang & Chen 2019). Moreover, happiness is connected to better social, physical, and psychological wellbeing (Lyubomirsky et al. 2005). The connection of moving in nature to both psychological and physical wellbeing and health has also been recognised. Physical activity (PA) in nature predicts better self-esteem and more positive mood and happiness (Bratman et al. 2015; Kaplan 2001; Korpela et al. 2014; McMahan & Estes 2015). Still, research suggests that mental health concerns are increasing in the population, causing challenges globally (Whiteford et al. 2010).

In addition, recent cross-sectional studies explained that PA correlates with adult happiness (Lathia et al. 2017; Zhang & Chen 2019). This positive response between happiness and PA has been found in 15 European countries (Richards et al. 2015; Zhang & Chen 2019). Results indicate that being happier might correlate with more PA (Zhang & Chen 2019), or this could work the other way around, as engaging PA has been proven to increase happiness (Richards et al. 2015). Furthermore, physical inactivity habits usually start from childhood, running in the family (Sleddens et al. 2017). Parents suffering from depression or stress can face challenges to maintain their daily health-related routines for the parent and the child (Miller & Lumeng 2018).

Nature provides restorative benefits to both body and mind (Kelley et al. 2022, 2; Puhakka 2021). In addition, nature PA is associated positively with wellbeing (Barton & Pretty 2010, 1; Bowler et al. 2010; Kelley et al. 2022, 2). Happiness can mean different things to a variety of people, but it brings health and wellness to everyone. As nature seems to have a remarkable impact on happiness, nature should be emphasised more in future family-based interventions starting from an early age.

This master's thesis primarily examines the associations between parent-child nature visits and parent's happiness. Secondly, the associations between PA engagement with parent-child or the whole family and parental happiness, and the connection between family nature visits and the living environment (urban vs. rural) are investigated. Study data used in this research is from the cross-sectional SUNRISE Helsinki Study. The examined study data in this research

included 183 parents and their 3 to 4-year-old children living in Helsinki and surrounding rural areas in Southern Finland.

2 HAPPINESS

Eudaimonia is a way of life according to which inner values are in the first place in life. Life is focused on goals a person feels valuable (Ryan et al. 2013), which is associated with subjective wellbeing (SWB) (Diener 1984). SWB includes life satisfaction, also described as hedonistic wellbeing (Kahneman et al. 1999). Happiness has been described as a state of mind fulfilled by contentment and joy, which reflects a person's SWB (Diener 2000; Zhang & Chen 2019). Happiness is also defined as satisfaction with life and the presence of positive feelings (Capaldi et al. 2014; Diener 1984). Happiness is often described with the words pleasure, engagement, and meaningfulness (Peterson et al. 2005). Happiness is connected to better social, physical, and psychological wellbeing (Lyubomirsky et al. 2005), and it is embraced in Western cultures at both an individual and societal level (Veenhoven, 1994; Lyubomirsky & Lepper 1999, 137).

Happiness may mean a variety of things to people. To some people, happiness is associated with wealth, whereas for others, it is spiritual salvation or true love (Lyubomirsky & Lepper 1999, 138). Chaplin's (2009) research stated that activities, material things, and achievements bring happiness to children and adolescents. Blacklock et al. (2007) have stated that PA is associated with happiness but that demographic factors like income, education, and lifestyle significantly affect happiness (Richards et al. 2015). Also, women are found to be happier with their lives. In addition, educational attainment and marital status have been positively connected with life satisfaction (Pew Research Center, 2014; Biedenweg et al. 2017). People also tend to know if they are happy or not (Lyubomirsky & Lepper 1999, 138).

2.1 Parental happiness

Parental happiness has been found to be associated with self-esteem and maternal authoritativeness, which is associated further with emotional stability (Furnham & Cheng 2000). The gap between parents' and non-parents' happiness has narrowed during past years. Parents have been found to become happier in recent years. Having children may help parents stay involved in society and engage socially with their environment, positively affecting wellbeing and social connection with other people. Parents with children tend to stay more involved in their community (Herbst & Ifcher 2016).

Studies suggest that happiness increases while having the first and second child but not with the third child. Also, parents who are well-educated or have a child at an older age experience more happiness (Myrskylä & Margolis 2014). As social policies and parental happiness were examined in East and South Asia, it was shown that differences between people with or without children's happiness could be minimised with annual leave, parental leave, paid maternity, and flexibility at work (Chao & Glass 2020).

Parents suffering from depression or stress can face challenges to maintain their daily routines for sleep and PA for their family members (Miller & Lumeng 2018). Mother's stress has been found to relate to obesity, sedentary behaviour, and lower levels of PA (Miller & Lumeng 2018; O'Connor et al. 2017; Parks et al. 2012). Also, parental overall mental wellbeing has a complex impact on their child's health behaviours (Engberg et al. 2024).

2.2 Measuring happiness

Researchers have used the Subjective Happiness Scale (SHS) and Life Satisfaction Scale when studying happiness and life satisfaction. The four-part SHS has been constructed from 13 self-report items. Responses for the four items are given from one to seven, with a higher score indicating higher happiness (Lyubomirsky & Lepper 1999). SHS has been created to measure global subjective happiness, and due to its reliability, it has been used in many happiness studies. In two items, respondents rated themselves using the Likert Scale by comparing their subjective happiness to their peers. In the other two items, respondents are given a written description of happy and unhappy individuals to help them examine how the description matches themselves. Even though the SHS is short, its validity and accuracy have been proved, and it exceeds the criteria for measurement accuracy (Lyubomirsky & Lepper 1999).

For measuring SWB, the Life Satisfaction Scale is one of the most frequently utilised assessment tools (National Research Council 2013). It includes personal and social characteristics (Biedenweg et al. 2017; Kahneman 1999), from which five identified primary predictors of life satisfaction are used in the scale. Primary predictors include the quality of social and community relationships, financial status, and job satisfaction (Biedenweg et al. 2017; Rath & Harter 2010).

3 NATURE

Nature is a place to relax, engage with friends or be physically active. Named nature settings can be in neighbourhoods, like parks and green areas, or cities, like city parks, or in natural settings, like forests and nature reserves (Thompson Coon et al. 2011, 1771). Nature settings have become a safe place for individuals to eliminate their daily demands and distance themselves from urban lifestyle intensity (Çalik et al. 2013). Nature provides a place to listen to our inner voice and calm our minds and body (Maas et al. 2009; Takano et al. 2002; Pasanen et al. 2014). Urban areas, streets, and neighbourhoods should be planned to promote different forms of mobility, like cycling and walking, and to involve accessibility by wheels. Access to green and recreational spaces, like coastal areas and rivers, must be ensured for everyone regardless of residence or age (WHO 2018).

Nature contact has many benefits, but for some people, nature can also cause distressing and uncomfortable feelings. Discomfort has been linked to dangerous animals like bees and venomous snakes (Milligan & Bingley 2007; Woodgate & Skarlato 2015). Addressing these fears, resolving them, and not letting them hinder people from engaging with nature is essential. Especially parents should be encouraged to visit nature (Hakoköngäs & Puhakka 2023) as their attitudes influence their children's opportunities to spend time in nature (McFarland et al. 2014).

3.1 Nature and psychological wellbeing

Interaction with nature enhances wellbeing and health for children and adults (Keniger et al. 2013; Kokkonen et al. 2021b; Puhakka 2021; Ray et al. 2022; Thompson Coon et al. 2011, 1761; Twohig-Bennett & Jones 2018). That is why also the importance of nature in promoting wellbeing has been identified in many studies (Barton & Pretty 2010, 1; Biedenweg et al. 2017; Kelley et al. 2022, 1; Pretty et al. 2007).

Quality of life

Joy and life satisfaction are proven to be the highest among people who visit nature and parks in their leisure time (Besikci et al. 2019, 11) and engage in outdoor activities (Thompson Coon et al. 2011, 1761). People participating in outdoor activities also tend to have better quality of

life, providing positive physiological and mental benefits (Besikci et al. 2019, 8). Holt et al. (2019) agree as they also stated that people who spend time actively in green areas indicated better quality of life. Also, Self-reported happiness has proved to be more significant for people who visit nature and green areas (Biedenweg et al. 2017; MacKerron & Mourato 2013), which can be explained by nature's ability to affect emotional wellbeing positively (Biedenweg et al. 2017; Bratman et al. 2015; Pasanen et al. 2014; White et al. 2013a, 2013b).

It has been indicated that movement in nature tends to reduce peoples' negative emotions, improve happiness, and further positively affect behaviour. By reducing negative emotions, psychological wellbeing is improved, which has a positive effect on behaviour (Bratman et al. 2015; Kaplan, 2001; Korpela et al. 2014; McMahan & Estes 2015; Puhakka 2021).

Resilience and emotional wellbeing

Nature visits improve children's and adolescent's resilience and reduce stress (Gustafsson et al. 2021; Tillmann et al. 2018). Lowered physiological stress can already be achieved in the short term (Hartig et al. 2003; Pretty et al. 2005; Pasanen et al. 2014). These short-term nature exposure improvements could be explained by involuntary attention recovery (Kaplan 1995) and reduction of stress (Pasanen et al. 2014; Ulrich et al. 1991). Also, each additional weekly visit in nature has reduced poor mental health risk by six per cent (Mitchell 2013; Pasanen et al. 2014). Hartig et al. (1991) confirm this as their results showed that exercising in nature can prevent anxiety and depression more than it does in city settings. Especially people with mental health conditions gain significant benefits from nature (Barton & Pretty 2010; Pasanen et al. 2014).

Interaction with nature enhances mental wellbeing (Brito et al. 2022; Keniger et al. 2013; Puhakka 2021; Twohig-Bennett & Jones 2018), which provides a good basis for strengthening self-esteem. In Puhakka's (2021) research, participants mentioned that nature helped them gain better self-perception (Birch et al. 2020) and self-satisfaction. Also, a stronger sense of identity has been connected to nature (Biedenweg et al. 2017; Hinds & Sparks 2008).

Cognitive performance

Cognitive development has been proven to improve through visits to nature among children (McCormick 2017). Spending time in nature is positively associated with cognitive functions (Biedenweg et al. 2017; Bratman et al. 2015; Hartig et al. 1991; Keniger et al. 2013; Puhakka 2021; van den Berg et al. 2003) and the ability to concentrate (Bratman et al. 2015; Hartig et al. 1991; Puhakka 2021; van den Berg et al. 2003). Nature settings indeed positively impact concentration and challenging tasks during academic performances (van den Berg et al. 2003). Also, cognitive recovery (Bratman et al. 2012; Biedenweg et al. 2017), learning ability and motivation have been promoted effectively (Puhakka 2021).

3.2 Nature and physical wellbeing

Frequent nature visits and time spent in other green areas are proven to lower the risk of various health concerns (Twohig-Bennett & Jones 2018) and promote the immune system (Aerts et al. 2018). Nature visits have a decreasing effect on blood pressure (Markevych et al. 2014), sedentary behaviour and obesity risk (Dadvand et al. 2014). Living close to nature and neighbourhood greenness also positively affects health indicators like longevity and morbidity (Maas et al. 2009; Takano et al. 2002).

Because nature offers opportunities to PA (Puhakka 2021), it is important to encourage movement in nature already starting from childhood. Nature visits improve motor skills (Gill 2014), and frequent family nature visits have been connected to higher amounts of moderate-to-vigorous physical activity (MVPA) (Kokkonen et al. 2021a) and improved physical wellbeing (McCormick 2017). Improvements in sleep quality (Bratman et al. 2015; Brito et al. 2022) and longer sleep times have also been connected to frequent family nature visits (Söderström et al. 2013; Gustafsson et al. 2021).

3.3 Nature and social wellbeing

Nature's environment creates opportunities for social experiences together with family and friends (Greenwood & Gatersleben 2016), which help to improve social relationships (Biedenweg et al. 2017; Puhakka 2021; Sullivan et al. 2004; Weinstein et al. 2015). Social studies suggest that engaging with nature may lead to reduced criminal behaviour (Biedenweg

et al. 2017; Kuo & Sullivan 2001). Puhakka's (2021) research explained that nature provides an environment in which to share social experiences and relieve the pressures of student life. These findings affirm that social and spiritual benefits have been connected to nature (Keniger et al. 2013; Twohig-Bennett & Jones 2018).

It has been recognised that time spent in nature in cultural practices can enhance social empowerment and cohesion (Biedenweg et al. 2017; Kuo & Sullivan 2001; Puhakka 2021; Weinstein et al. 2015). In natural environments, life is not so hectic anymore, which gives the opportunity to reflect on personal matters and free oneself from social expectations (Birch et al. 2020; Puhakka 2021). Nature has been experienced restorative, as it gives us the opportunity to take a break from stimuli that usually capture our attention (Kaplan 1995). Nature helps to distance people from everyday routines, and by being free from these demands, it is possible to achieve balance in life and clarify thoughts (Puhakka 2021). Figure 1 summarises nature's benefits for wellbeing.

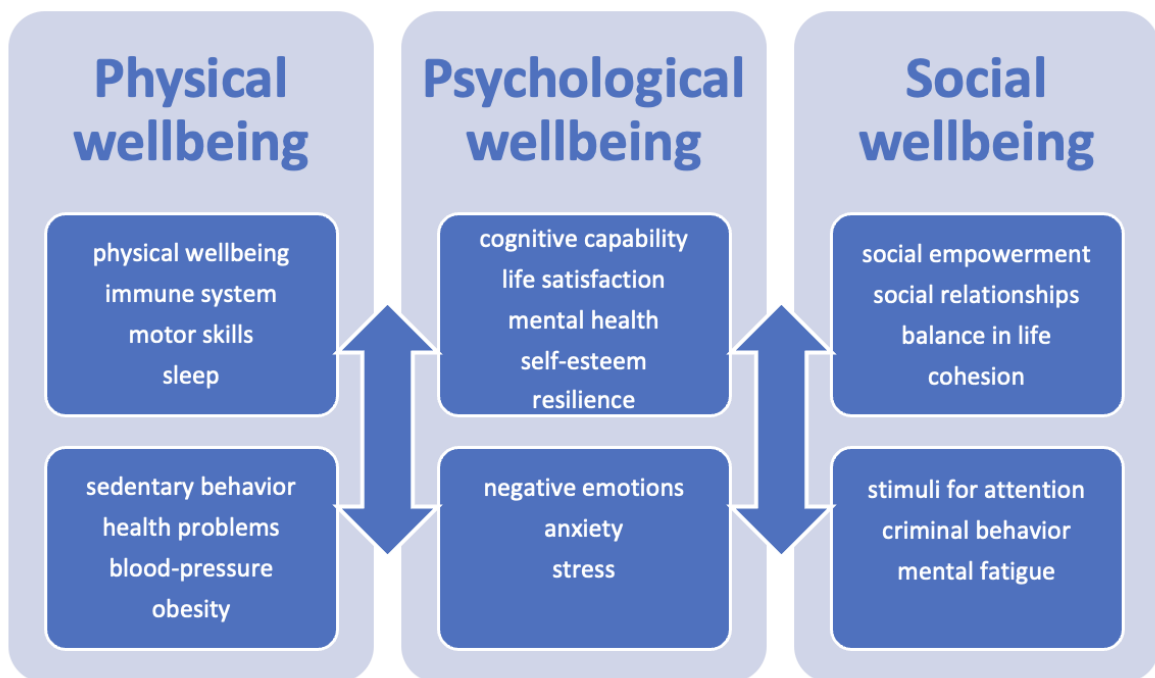


FIGURE 1. Nature's benefits for wellbeing

4 PHYSICAL ACTIVITY

PA encompasses all types of movement. It can be movement in different ways, like walking or part of daily routines like housework. PA can also be voluntary or compulsory, but both still offer the same benefits (WHO 2018). Global and national guidelines for PA offer guidance for many public health actions. National guidelines help people maintain an active lifestyle and good health (Bull et al. 2020). Global estimates show that every fourth adult (Guthold et al. 2018) does not reach aerobic exercise recommendations, so the need to promote PA for large populations is recognised (Bull et al. 2020).

Adults should regularly engage with PA, keeping in mind that any PA is better than none. The PA guidelines for adults include both aerobic and muscle-strengthening exercises each week. Timely guidelines for PA are between 150–300 min of moderate intensity or 75–150 min of vigorous-intensity PA or some other similar PA weekly (Bull et al. 2020; WHO 2018). If not used to PA, it is important to start in moderation and increase the PA amount and intensity step by step (Bull et al. 2020). PA above the recommended amounts of moderate- to vigorous physical activity (MVPA) has been associated with motor development, health, and fitness (Carson et al. 2017).

Frequent muscle-strengthening, aerobic PA, and reduced sedentary behaviour are crucial to people's health. PA's health benefits reach people from every age group and people with different abilities. PA is key to maintaining people's health. However, it is also an effective way to save money because sedentary behaviour and physical inactivity are associated with cardiovascular disease and risk of type 2 diabetes (Bull et al. 2020), which cause economic burden to individuals as well as society. Activities like sitting or lying with lower energy expenditure than 1.5 metabolic equivalents are considered sedentary behaviour. Health can be enhanced by reducing sedentary behaviour and increasing PA (WHO 2018).

4.1 Happiness and physical activity

Recent cross-sectional studies have shown that PA is associated with happiness (Lathia et al. 2017; Zhang & Chen 2019). This positive correlation between PA and happiness has been proved in 15 European countries (Richards et al. 2015; Zhang & Chen 2019). Results indicate

that more happiness might lead to more PA (Zhang & Chen 2019), but this could also work the other way around, as engaging PA predicts more happiness (Richards et al. 2015). In fact, the strongest connection between happiness and longevity has been connected to PA (Koopmans et al. 2010).

Zhang and Chen (2019) have conducted a review article on associations between happiness and PA. Findings support the positive connection between happiness and PA in the long term. According to studies, no significant difference was found between active (150–300 min moderate to—vigorous PA per week) and very active individuals (> 300 min moderate to—vigorous PA per week) in terms of their happiness. However, differences in happiness levels have already been proved between one exercise done per week compared to none per week (Zhang & Chen 2019), which means that a slight increase in PA can enhance happiness levels. Happiness is an example of a positive construct of mental health, which PA improves by increasing resilience to emotional stress (Richards et al. 2015).

There are still some conflicts between the studies concerning happiness and PA. While some studies provide evidence that PA might positively affect happiness in the long term, approving the connection between higher PA frequency and higher happiness levels, other studies support decreased PA instead (Richards et al. 2015; Zhang & Chen 2019). PA volume and PA frequency seem to be important factors for happiness. Balanced exercise, stretching, aerobic exercise, and leisure time activities showed consistent positive associations with happiness levels. Future studies should focus on the ideal dose and type of PA to gain the most significant advantages for happiness (Zhang & Chen 2019).

4.2 Family physical activity

Children spend most of the day with their parents or caregivers. Because of this, parents have a key role in allowing their children to gain different experiences (Gustafson & Rhodes 2006). Parents have the possibility to either restrict or allow their families' PA behaviour. Few interventions have been conducted to increase families' PA levels, and the results have been positive (Rhodes et al. 2010). However, there is still a need for more studies of parent-child PA together (Jago et al. 2014) to effectively promote parent-child PA (Engberg et al. 2024).

Family exercise/PA means PA in which the whole family engage together. It is active togetherness, where both adults and children are physically active. Family PA includes activities such as voluntary everyday exercise indoors and outdoors, as well as activities that are goal-oriented and guided. According to the Family Exercise Barometer 2021, most Finnish families (92%) engage in independent family exercise, and 50% of the families regularly move at least once a week together (Suomen Latu 2024).

The most engaging factor for family PA is the possibility of family time together. Positive mood gained and increasing amount of PA for both the child and parent are also considered important factors. Enabling an active and healthy lifestyle also motivates the family PA. Outdoor sports, different games, walking and cycling are the most common ways to be active together as a family. Recognised challenges to being active together as a family are usually work-related factors, like the lack of time (Brown et al 2015), limited resources, and lack of motivation (Suomen Latu 2024).

Physical inactivity tends to begin in childhood and runs in the family (Sleddens et al. 2017). However, family-based interventions for family PA are scarce because of the difficulty of engaging both parents and children in the sessions together at the same time. Critical barriers to attending sessions are problems with scheduling and limited time (Brown et al. 2015). It has been suggested that activity monitors and mobile applications can increase the PA of the whole family (Schoeppe et al. 2022).

4.3 Happiness and physical activity with the family

Family PA when children are young is still very little studied (Jago et al. 2014). However, the stress of the mother is related to more sedentary behaviour, obesity, and lower PA (Miller & Lumeng 2018; O'Connor et al. 2017; Parks et al. 2012), and greater parental happiness tends to engage children in healthy behaviours (Engberg et al. 2021). Brown et al. (2015) found that social benefits and enjoyment were critical factors for families involved in PA together. According to these findings, parental happiness may be related to children's and family's health behaviours, such as time spent in nature and PA behaviour, which are examined in this study.

Still, research data demonstrates that children spend less time outdoors than before (Kempe et al. 2016). Experienced barriers towards nature visits could be one reason for this phenomenon. Parent's poor mental wellbeing correlates with both experienced barriers to nature visits and with less nature visits with their child (Gustafsson et al. 2021). Because time spent in nature is connected to many health benefits in adults (Twohig-Bennett & Jones 2018) and children (Chawla 2015), and frequent nature visits are also associated positively with children's development and health (Kokkonen et al. 2021a; Kokkonen et al. 2021b), families should be encouraged to visit nature. It would be essential to carry out appropriate actions to increase movement in nature and nature connectedness (NC) because nature's significant positive health-promoting factors have been identified.

4.4 Happiness and physical activity in nature

In the research on perceived happiness and nature, 67% of the participants were convinced that nature makes people happy (Hakoköngäs & Puhakka 2023). Nature gives energy and increases gratitude for nature (Puhakka 2021). Findings state that nature can make people happy based on the positive associations between wellbeing and nature. Nature has been found to bring happiness through opportunities for emotional and cognitive renewal and physical activities it offers. Nature brings back feelings and memories from childhood, which emphasises happiness. Nature has been described as a happiness-creating environment (Hakoköngäs & Puhakka, 2023).

Wellbeing consists of feeling good and meaningful activity (Keyes & Annas 2009; Puhakka 2021). Nature's effects on health have been recognised in many different physical activities. Training in interaction with nature is called nature training or green training (Brito et al. 2022). Green exercise is associated with better mental wellbeing in the long term (de Vries et al. 2013; Pasanen et al. 2014) and the short term (Barton & Pretty 2010; Bowler et al. 2010; Pasanen et al. 2014; Thompson Coon et al. 2011). Programs like Green Gym and Blue Gym try to enhance the connection of people with nature to promote wellbeing and health (Thompson Coon et al. 2011, 1761). Indeed, nature offers opportunities for emotional and cognitive renewal, alleviating various physiological stressors (Puhakka 2021). Research by Barton and Pretty (2010) also proved that green exercise promotes self-esteem and mood (Pretty et al. 2007), especially among people under 30 years of age (Puhakka 2021). These improvements can be

gained already when spending only five minutes in nature (Bowler et al. 2010; Pasanen et al. 2014). Nature exercise should be encouraged so that it is possible to use these quickly obtained health benefits to strengthen the psychological wellbeing of young people.

PA in nature have a greater positive effect on mood (Brito et al. 2022; Teas et al. 2007), happiness (Brito et al. 2022; Shin et al. 2013), joy (Teas et al. 2007), vitality (Jang & So 2017), revitalisation (Brito et al. 2022; Pasanen et al. 2014; Thompson Coon et al. 2011), and self-esteem than PA in indoors (Brito et al. 2022). PA in nature promotes energy levels and positive engagement and reduces tension, stress (Wooller et al. 2018), depression, and anger (Jang & So 2017) more than PA indoors (Pasanen et al. 2014; Thompson Coon et al. 2011, 1761). It has also been proved that people engaging in PA in nature show more calmness (Lacharite-Lemieux et al. 2015; Kim & Lee 2018), but engagement and calmness are reduced in PA indoors (Brito et al. 2022).

Nature provides an opportunity to engage in various inexpensive leisure activities, and green and attractive nature trails make them more likely to be used for commuting (Brito et al. 2022). In Finland, nature plays a huge role in people's lives (Periäinen 2006). According to research results, women, the elderly, and parents of young children spend the most time in nature (Pyky et al. 2019). Outdoor activity statistics confirm that families with young children (0-6-year-old) spend more time together in nearby nature areas than families with older children (7-16-year-old) (Neuvonen & Sievänen 2011). Parents have a huge impact on their children's behaviour and activities, as they are responsible for offering possibilities to their children to engage with nature (Ashbullby et al. 2013; Larson et al. 2011). This possibility should be used to engage in PA in nature during childhood because it predicts PA and nature visits as adults (Calogiuri 2016; Wood & Smyth 2016). As parents' time spent in nature is associated with their children's possibility to visit nature, it is important to understand what motivates parents to spend time in nature (Gustafsson et al. 2021).

Whether looking at pictures of nature or being active in nature, exposure to nature has proved to bring numerous health benefits (Maas et al. 2009; Takano et al. 2002; Pasanen et al. 2014). Children should have a chance to connect with nature, as NC involves the enjoyment of nature, awareness of nature, empathy, and a sense of responsibility. Families' nature visits in early childhood promote children's NC, which could help to raise responsible children when it comes to the environment (Ray et al. 2022). Happiness is also associated with NC (Capaldi et al. 2014).

4.5 Place of residence and physical activity in nature

Even though the interest in nature has been recognised due to many benefits, still already 75% of Europe's population lives today in urban environments (Thompson Coon et al. 2011, 1761). Indeed, the world has been urbanised as people rush to move to urban areas, and most of the population already live in urban environments (70% of the population) (The Shanghai Consensus on Healthy Cities 2016). Nature visits should be promoted for families in both urban and rural areas to connect families with nature. Easily accessed nature areas provide a possibility for everyone to reach and access nature. Healthcare organisations and professionals should inform families about these different natural activities and opportunities (Kokkonen et al. 2021a).

Along with time spent in nature, living close to nature seems to be connected to happiness. Increased happiness has also been connected to green areas in the neighbourhood (Pasanen et al. 2014; Van Herzele & de Vries 2012). Green spaces in a neighbourhood can reduce stress on a subjective and objective level (Pasanen et al. 2014; Ward Thompson et al. 2012) and diminish mental distress (White et al. 2013). Studies suggest that environmental factors, such as school grounds and living location, affect PA's total time and intensity among children and adolescents (McCrorie, Fenton & Ellaway 2014). Living close to nature can indeed increase PA (Pretty et al. 2003), and utilising the attraction of nature has been recognised to increase exercise (American Public Health Association 2013; Barton & Pretty 2010, 1; Kärmeniemi et al. 2018). Environment planning should be equal, safe, and reachable, and equal rights should be guaranteed to all people regardless of where they live or which PA they engage in (WHO 2018) to guarantee equal opportunities to be physically active in different environments.

A positive correlation has also been found between children's PA and green areas (McCrorie, Fenton & Ellaway 2014). However, research results regarding the engagement of urban and rural residents in PA have been contradictory. Some findings propose that people who live in rural environments met the PA recommendations least likely, as people who lived in suburban environments met the PA recommendations most likely. The biggest divergences between urban and rural areas mentioned were parks, gyms, and streets as places to engage PA. Despite the conflicting results of the place of residence between urban and rural areas, PA engagement has been found to be associated with socioeconomic status and living environment (Parks et al. 2003), but more research is needed to examine the factors affecting the association.

4.6 Research gap

The systematic literature search was conducted in August 2023 in four databases (SPORTDiscus, CINAHL, Web of Science and PsycINFO) with the search phrase “(Happiness OR wellbeing OR life satisfaction) AND (Outdoor activities OR outdoor activity) AND (Outdoors OR outside OR nature)” (appendix 1). Studies were conducted from the perspective of associations of PA in nature environment, physical and psychological wellbeing, and health (Bratman et al. 2015; Kaplan 2001; Korpela et al. 2014; McMahan & Estes 2015). Directly, the connection between parent-child nature visits or family PA, and parental happiness has not been examined in previous studies. A description of the reliability assessment for the included research articles can be seen in appendix 2. A manual search was conducted to deepen further the understanding of parent-child nature visits and family PA's association with parental happiness.

The connection between nature and PA to happiness has been identified in the earliest studies, but it is still challenging to conclude the direction of the connection. Research gaps have been recognised between nature and PA behaviour and parental happiness, especially regarding the happiness of parents of younger children. Positive correlations between PA and greenspaces have been established. Studies suggest that environmental factors like streets, school grounds, and living location have an influence on total PA among children and adolescents (5-18-year-old) (McCrorie, Fenton & Ellaway 2014). However, parent-child PA engagement when children are young is still low (Jago et al. 2014), so more studies need to be conducted to understand how to promote parent-child PA in future (Engberg et al. 2024).

Mental health disorders are increasing in the population and cause significant global health challenges (Whiteford et al. 2010). Parental mental health may further have a complex impact on a child's health behaviours. Parents who suffer from stress or depression can have challenges maintaining regular schedules for PA and sleep for themselves and the whole family (Miller & Lumeng 2018). Encouraging parents to engage with nature PA with their family could be one way to promote parents and their children's wellbeing. Adults are role models for being active in nature, and they are significant for the whole family, as the children of parents who actively move in nature also move in nature more often (Hunt et al. 2016).

Research is sparse between urban and rural areas and associations with PA behaviour of children (McCormack & Meendering 2016). Previous studies have indicated that children residing in rural regions tend to be more active physically and less sedentary compared to their counterparts in urban areas (McCrorie et al. 2020), but more research needs to be conducted to draw conclusions and examine the factors affecting PA behaviour. More information is gained on the nature behaviour differences in urban and rural areas by examining the association between the place of residence (urban vs. rural) and parent-child nature visits.

5 PURPOSE OF THE RESEARCH AND RESEARCH QUESTIONS

The master's thesis *primarily* examines the association between parent-child nature visits and parent's happiness. *Secondarily*, the associations between parent-child or whole family PA and parents' happiness, and the connection between the living environment (urban vs. rural) and the family's visits to nature are investigated. The results gained from this study increase our understanding of nature's benefits for wellbeing and the association of family PA with parental happiness. Results can help to consider the effects of nature visits with parents and children on promoting wellbeing and happiness. With this information, future studies can be conducted, and maybe, in the long term, new guidelines or even recommendations for spending time in nature can be made.

5.1 Research questions

1. Is the frequency of parent-child nature visits with their 3- to 4-year-old child associated with parental happiness?
2. Is the frequency of engaging in physical activity with their 3- to 4-year-old child or the whole family associated with parental happiness?
3. Is the place of residence (urban vs. rural) associated with the parent-child nature visits?

5.2 Research hypotheses

Research aims to explore the connection between parent-child nature visits and parent's happiness. Since movement in nature supports wellbeing and health in many ways, which are part of the multidimensional concept of happiness, it is assumed that there is a positive connection between the parent-child nature visits and the parent's happiness (H1). However, this possible connection can also be in the other direction. If the parental happiness is higher, it is assumed that the parent also visits nature more often with his child.

Another research hypothesis is that when the family engages in PA more frequently, parental happiness also increases (H2). As mentioned before, the directions of the cause cannot be proved in this study. However, it is assumed that if the parental happiness is higher, the parent also has the energy to engage PA more often with their child or the whole family. Cross-sectional studies cannot determine cause and effect, so only suggestions of possible connections between variables can be made.

The third research question will examine the place of residence (urban vs. rural) and its association with the parent-child nature visits. As living environment influences people's nature engagement and living close to nature can increase PA (Pretty et al. 2003), it is assumed that people who live closer to nature will also spend more time together with the parent and child in nature (H3).

6 RESEARCH MATERIAL AND METHODS OF ANALYSIS

The SUNRISE Finland study is part of the international SUNRISE study (Engberg et al. 2024; Okely et al. 2021). The SUNRISE Finland study's data collection was conducted between June 2022 and November 2023 (Engberg et al. 2024). The material for the master thesis is part of Folkhälsan's SUNRISE Finland study, collected from Helsinki and surrounding rural areas.

The SUNRISE Finland study aims to find the potential correlations between children's health behaviours, environmental features, socioeconomic conditions, and parents' mental health. The data used is from a cross-sectional SUNRISE Finland study. Parents involved in the research completed 1-2 surveys, about 15-20 minutes each. These surveys covered topics, e.g., background demographics and details about nature visits and family PA (Engberg et al. 2024). The study material for this study is from the SUNRISE Helsinki study, which was the first data collection wave in the SUNRISE Finland study and was conducted between June 2022 and November 2022. The material being utilised is from the SUNRISE Helsinki study questionnaires filled out by the parents.

6.1 Data and data collection

The participants of this study are parents or caregivers (N=183) of 3- to 4-year-old children recruited through the early childhood education and care (ECEC) centres. Invitations and information about the study were sent to ECEC centres in the city of Helsinki and the surrounding rural areas. The participants attending were equally from urban (N=85) and rural areas (N=98). Then, parents or caregivers of children aged 3 to 4 years from participating centres were contacted to take part in the research (Engberg et al. 2024).

Necessary information was provided to the participants so they could decide whether they wanted to participate in the study. All parents/caregivers signed a consent form when taking part in the study. The information sheet and consent form detailed the study's procedures, objectives, and possible benefits and risks. Study participation was voluntary, and participants could withdraw from the study whenever they wanted. The SUNRISE Finland research protocol was evaluated by The Folkhälsan Research Center's Ethical Review Board in Humanities (FH1/2022_0703) (Engberg et al. 2024).

Parents filled in two questionnaires (International SUNRISE Parental Questionnaire and the SUNRISE Finland Parental Questionnaire). This study uses data from the SUNRISE Finland Parental Questionnaire. Participants were contacted, and information letters were sent via emails and/or paper forms by the ECEC centres. In addition, the ECEC centres had posters with barcodes on information sheets and electronic consent forms. Study questionnaires and information letters were implemented in three languages: Finnish, Swedish and English.

Data from the SUNRISE Finland Parental Questionnaire was analysed, focusing on three specific associations relevant to the research questions.

1. Parent-child nature visits – Parental happiness
2. Physical activity of parent-child or whole family – Parental happiness
3. Place of residence (urban vs. rural) – Parent-child nature visits

6.2 Variables to be analysed

Four main variables are used to examine the associations in this research. In this research, three independent variables and one dependent variable are under examination to investigate the research questions. Also, three covariates (parents' and childrens' sex and parents' educational level) are used in analyses.

Independent variables

Parent-child nature visits

Parents reported how often they visited nature with their child with the following question: "How often do you visit nature (e.g., in the forest, nearby forest, beach, nature trail) with your child? with answer options: 1=Less than once a month, 2=1-3 times a month, 3=1-2 times a week, 4=3-4 times a week, 5=5-6 times a week, and 6=Every day". This question investigates the association of parent-child nature visits with parental happiness.

Family PA

Participants reported answers to engaging PA with their family with the question, "How often do you engage in physical activity with your child or your whole family (e.g. cycling, walking, playing outside, camping, indoor exercise, playing games)? (Engaging in physical activity with family is referred when at least one adult family member participates actively in the activity with his child), answer options "1=Never, 2=less than once a week, 3=1-2 days a week, 4=3-4 days a week, 5=5-6 days a week, and 6=Daily" followed the question. The question provides data regarding PA engagement with the family to further explore the associations to parental happiness.

Place of residence

During the recruitment of ECEC centres, both urban centres (city of Helsinki) and rural centres (within about 100 km radius of Helsinki) were selected. The Finnish Environment Institute (SYKE) created Finland's 2018 urban-rural spatial classification, which was used when selecting ECEC centres (Finnish Environment Institute 2023).

Dependent variable

Parental happiness

In this study, the participants reported their subjective happiness according to the SHS. SHS measures the perception of happiness, and it has great reliability (Lyubomirsky & Lepper 1999; Schaefer 2005). SHS includes questions on subjective happiness and how people see themselves compared to their peers. Participants evaluate numerically with a Likert scale ranging from 1 to 7, which answer option best describes their situation. SHS includes four questions. The first question in SHS is: "In general, I consider myself: 1= Not a very happy person, 7= A very happy person". The second question is: ". Compared to most of my peers, I consider myself: 1=Less happy, 7=More happy". The following questions assess how happiness is seen in different people. The third question is: "Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterisation describe you?, 1=Does not fit at all, 7=Fits well". The fourth question regarding happiness is the following: "Some people are generally quite unhappy. Even if they are not depressed, they never seem as happy as they could be. To what extent does this characterisation describe you? 1=Does not fit at all, 7=Fits well".

The composite score (happiness score) was used as the primary variable, "Parental happiness", to examine the correlations between parent-child nature visits and family PA with parental happiness. A single composite score for subjective happiness was calculated by averaging responses from the four happiness questions, but before that, the responses from the fourth question were reverse-coded (Lyubomirsky & Lepper 1999). The possible score range was from 1 to 7. A happiness integer score was produced to investigate the population's descriptive statistics. As the lowest reported happiness composite score was 2.75 (0.5% of participants) and the highest 7.0 (6% of participants), the happiness integer score was converted to integers starting from happiness integer score 3 (3=2.5 – 3.49, 4=3.5 – 4.49, 5=4.5 – 5.49 etc.). Happiness integer score was used to describe the distribution of parental happiness between respondents (figure 2). The happiness composite score for parental happiness was used in the main tests and analyses in SPSS to obtain accurate results.

Covariates

Sex

Parents reported their own and their child's sex from four different answer options that were "male", "female", "other", and "nonspecific". Answers were then categorised into two groups: male and female, as no other response categories were selected.

Education level

The highest education level was reported with eight different options in the questionnaire. The responses were grouped into low (primary- high- or vocational school), medium (bachelor's degree or equivalent), and high (master's degree or higher) educational levels.

6.3 Data analysis

Correlations provide information about the degree of dependence between two variables. Correlations examine whether there is an association between two variables or not. Spearman's correlation tests were used as a statistical method to investigate the relationship between the independent variables, parent-child nature visits and engagement to PA with the whole family,

and the dependent variable, parental happiness. Using Spearman's correlation test, possible relationships were explored between the frequency of nature visits with their child or PA with a child or whole family and parental happiness. However, it could not be examined which was the cause and which was the response as the data analysed was cross-sectional.

Two-way ANOVA was used to further analyse the effects of additional background variables, such as parents' and children's sex and parents' educational attainment, as covariates to explore parent-child nature visits and PA with a child or whole family and their connection to parental happiness. The differences between the urban and rural regions in parent-child nature visits were also examined. Cross-tabulation and Chi-square tests were conducted to examine the relationship between the place of residence and parent-child nature visits. Statistical analyses were performed with SPSS software, where a P-value of less than 0.05 was considered statistically significant.

TABLE 1. Analysis methods by research question.

Research question	Variables	Analytical method
1. Is the frequency of parent-child nature visits with their 3- to 4-year-old child associated with parental happiness?	Parent-child nature visits, Happiness score	Spearman correlation, Two-Way ANOVA
2. Is the frequency of engaging in physical activity with their 3- to 4-year-old child or the whole family associated with parental happiness?	Family physical activity, Happiness score	Spearman correlation, Two-Way ANOVA
3. Is the place of residence (urban vs. rural) associated with the parent-child nature visits?	Place of residence, Parent-child nature visits	Cross tabulation, Chi-square test, Two-Way ANOVA

6.4 Methodological considerations

The cross-sectional study method enabled to examine the current situation even though exploring changes in parent-child nature visits, PA with the whole family, and parental happiness longitudinally was impossible. This study does not examine whether increased parent-child nature visits or PA with the whole family followed or preceded increased parental happiness, which is a limitation of this cross-sectional study method. Therefore, this study could not investigate the detection of cause-and-effect relationships.

Happiness is a subjective experience, which is why the result of the study needs to be evaluated with caution. People can experience happiness and understand the questions according to happiness differently according to their perceptions and experiences in life. In addition, happiness also means different things to different people.

Nature visits of a parent-child were also examined based on the frequency of parent-child nature visits but not the time spent in nature, which can affect the study results. Considering the sample size of the research (N=183), it may have been also insufficient to detect smaller effects in the analyses.

7 RESULTS

Participants in the study included 165 mothers and 18 fathers. Participants' average age was 37 years, the oldest participant being 58 and the youngest 22. The participants' children included slightly more boys (N=103, 56.3%) than girls (N=80, 43.7%). Each education level (high, medium, low) was relatively evenly distributed between the participants. Half of the participants resided in urban areas, while the other half lived in rural areas. Participants in this study were overall happy, as over 80% of the participants reached a happiness score of 5 or higher (80.3% of participants). The participants' happiness score mean was 5.25 (SD 0.99), and the median was 5.00 (table 2 and figure 2).

TABLE 2. Participants' descriptive statistics: parental status, age, children's status, education, and place of residence.

Characteristics, N = 183	
Parental status, N (%)	
<i>Mother</i>	165 (90.2%)
<i>Father</i>	18 (9.8%)
Age in years, Mean (SD)	36.73 (5.22)
Children status, N (%)	
<i>Girl</i>	80 (43.7%)
<i>Boy</i>	103 (56.3%)
Education, N (%)	
<i>Low (primary- high- or vocational school)</i>	46 (25.1%)
<i>Medium (bachelor's degree or equivalent)</i>	63 (34.4%)
<i>High (master's degree or higher)</i>	72 (39.3%)
<i>Missing values</i>	2 (1.1%)
Place of residence, N (%)	
<i>Urban</i>	85 (46.4%)
<i>Rural</i>	98 (53.6%)

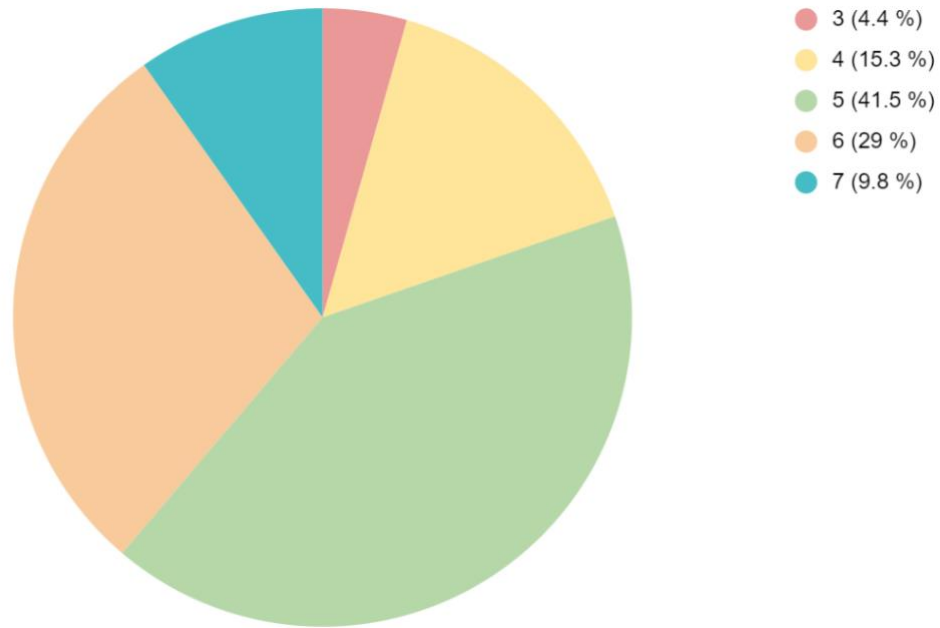


Figure 2. Distribution of parental happiness among participants.

Most of the participants (N=65, 35.5% of participants) spend time with their child in nature 1-2 times per week, and 29 (15.8% of participants) reported spending time with their child in nature as often as 3-4 times per week. A happiness integer score was used to describe the distribution between parent-child nature visits and parental happiness among participants. The highest level of happiness was experienced when families visited nature 5 to 6 times per week. However, a slight decrease in parents' happiness was observed as nature visits became daily (table 3 and figure 3).

TABLE 3. Distribution of parent-child nature visits.

Parent-child visits in nature	
Mean ^a	2.86
Median ^a	3.00
Std. Deviation ^a	1.110
Visits, N (%)	
<i>Less than once a month</i>	12 (6.6%)
<i>1-3 times per month</i>	64 (35%)
<i>1-2 times per week</i>	65 (35.5%)
<i>3-4 times per week</i>	29 (15.8%)
<i>5-6 times per week</i>	6 (3.3%)
<i>Daily</i>	7 (3.8%)
Total	183 (100%)

^a From six (1-6) answer options

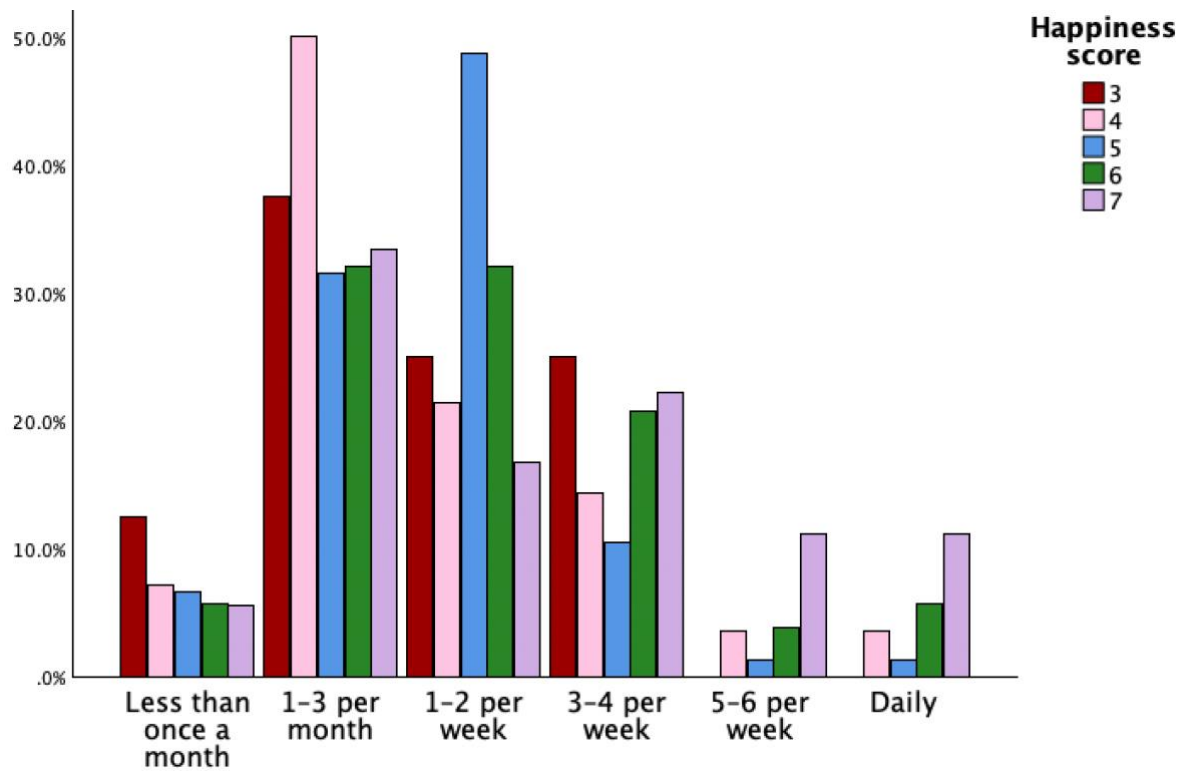


Figure 3. The distribution of the frequency of parent-child nature visits and parental happiness.

Family PA is under examination on research question 2 in this study. Almost all the participants, 157 (85.8% of participants) engaged in PA with their child at least once a week. Most families engaged to family PA 1-2 times per week (N=76, 41.5%) or 3-4 days per week (N=52, 28.4%). The highest happiness scores were also reached in the same subgroups. The highest increase between family PA and happiness levels was observed between participants who engaged in family PA with their child or whole family less than once a week and participants who engaged in family PA with their child or whole family 1-2 times per week. Also, as participants engaged with family PA more frequently than 3-4 times per week, parental happiness decreased slightly. The happiness integer score was used to describe the distribution between PA engagement together with family and parents' happiness (table 4 and figure 4).

TABLE 4. Physical activity with family.

Physical activity with family	
Mean ^a	2.51
Median ^a	2.00
Std. Deviation ^a	1.026
Quantity, N (%)	
<i>Less frequently than once a week</i>	26 (14.2%)
<i>On 1-2 days per week</i>	76 (41.5%)
<i>On 3-4 days per week</i>	52 (28.4%)
<i>On 5-6 days per week</i>	20 (10.9%)
<i>Every day</i>	9 (4.9%)
Total	183 (100%)

^a From six answer options (1-6).

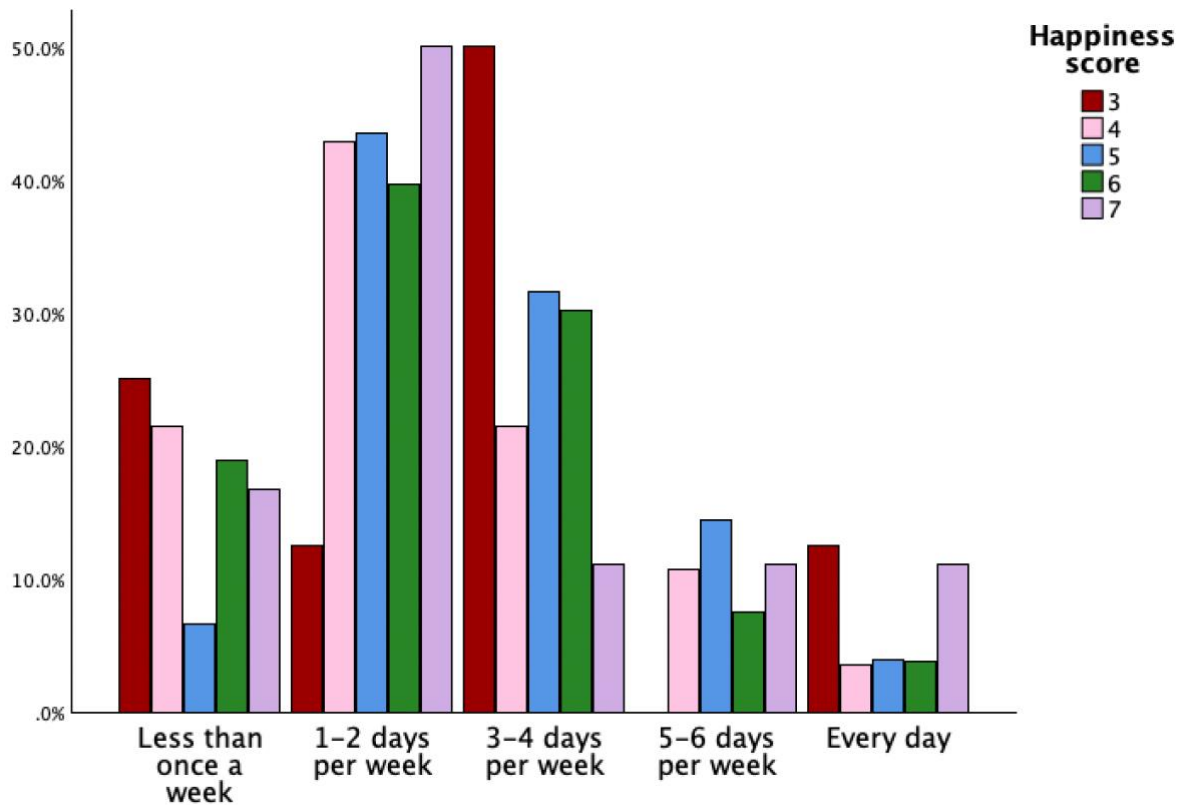


Figure 4. The distribution of engagement in physical activity with family and parental happiness.

7.1 Parent-child nature visits and parents' happiness

The association between the frequency of spending time in nature with their child and parental happiness was analysed using Spearman's correlation. Spearman's rho ($\rho = 0.181$) and P-value of 0.014 confirm a statistically significant positive correlation between parent-child nature visits and parental happiness. Results indicate a positive correlation between the two investigated variables, which means that when the frequency of parent-child nature visits increases, parents' happiness scores also tend to increase. A non-significant correlation was revealed between family PA and parental happiness ($\rho = -0.014$, $p = 0.856$). However, a significant connection was found between parent-child nature visits and family PA ($\rho = -.388$, $p = .001$) (table 5).

TABLE 5. Correlation matrix: Spearman's correlation between parental happiness, nature visits of parent and child, and physical activity with family.

Variable	Happiness score	Parent-child nature visits	Family PA
Happiness score	1		
Parent-child nature visits	0.181*	1	
Family PA	-.014	-.388**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

When investigating parent-child nature visits and parental happiness, males and females were compared to understand the possible differences between parents' sexes. When interpreting the results for females, Spearman's correlation coefficient was 0.186, indicating a positive correlation ($p=0.017$) between parent-child nature visits and females parental happiness. However, a positive correlation was not reached with males ($p=0.571$), indicating no association between parent-child nature visits and males' happiness levels. Findings suggest a difference between males and females regarding parent-child nature visits and associations with parental happiness. A statistically significant positive correlation was found only with females. When observing possible differences in parent-child nature visits and parental happiness between males and females, some variation seemed to be in the lowest and highest levels of parent-child nature visits. Males reached higher happiness scores when spending time together in nature with their child 1-3 times per month and 3-4 times per week. Females reached higher happiness scores in the other subgroups, and only females spend time in nature together with their children daily (table 6 and figure 5).

TABLE 6. Parental happiness score distribution between males and females based on the frequency of parent-child nature visits.

Parent-child visits in nature (N)	Mean	SD	N
Males			
<i>Less than once a month</i>	3.25	.	1
<i>1-3 times per month</i>	5.54	.62	6
<i>1-2 times per week</i>	4.61	.40	7
<i>3-4 times per week</i>	6.00	.90	3
<i>5-6 times per week</i>	5.25	.	1
<i>Daily</i>	.	.	0
Total	5.11	.88	18
Females			
<i>Less than once a month</i>	5.01	.98	11
<i>1-3 times per month</i>	4.94	1.02	58
<i>1-2 times per week</i>	5.11	0.78	58
<i>3-4 times per week</i>	5.22	1.05	26
<i>5-6 times per week</i>	6.00	1.08	5
<i>Daily</i>	5.61	1.00	7
Total	5.11	.95	165
Total			
<i>Less than once a month</i>	4.92	1.07	12
<i>1-3 times per month</i>	4.99	1.00	64
<i>1-2 times per week</i>	5.10	0.76	65
<i>3-4 times per week</i>	5.30	1.05	29
<i>5-6 times per week</i>	5.83	1.01	6
<i>Daily</i>	5.61	1.05	7
Total	5.11	.95	183

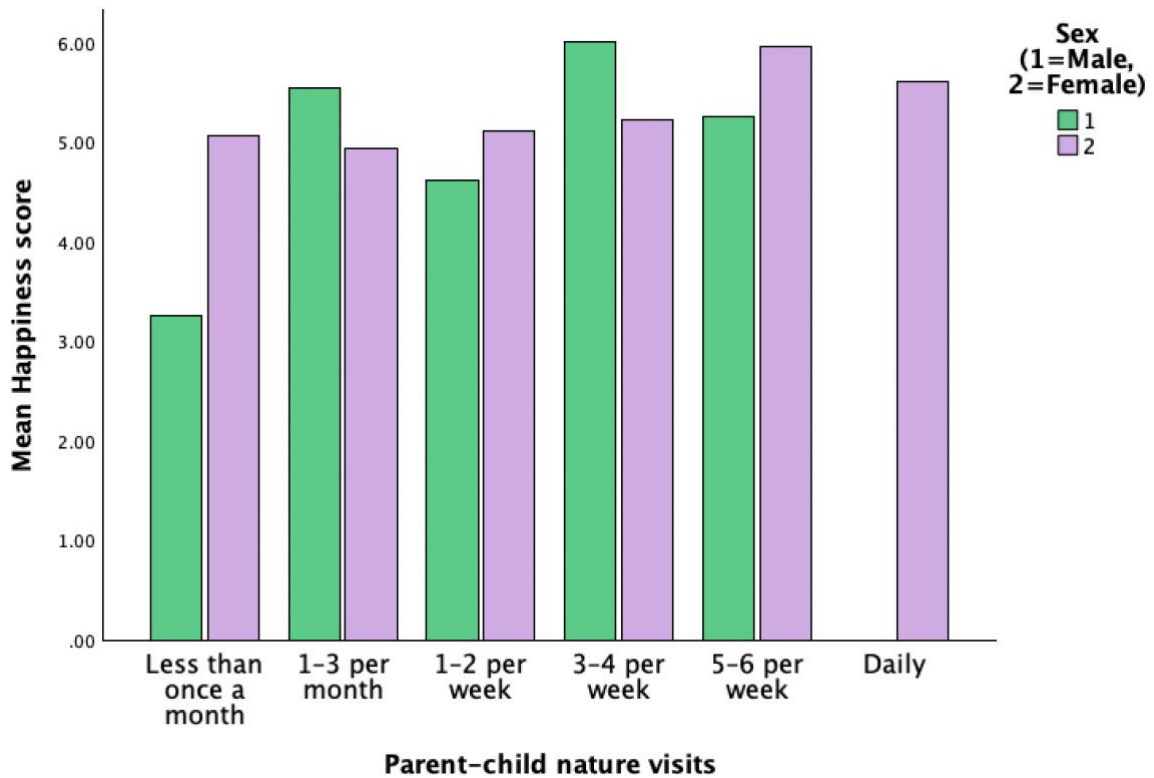


Figure 5. Comparison between males and females in parent-child nature visits and association with parental happiness.

Two-way ANOVA was used to explore further the connections between parent-child nature visits and parental happiness. The analysis revealed a non-significant interaction effect between parent-child nature visits and parents' level of education on happiness ($F[9, DF] = 1.442, p = 0.174$), suggesting that the relationship between nature visits and happiness levels did not vary significantly based on individual's level of education, and vice versa. When the distribution of parent-child nature visits was observed with descriptive data based on participants' level of education, it seemed that participants with lower education levels visited nature more daily (appendix 3), but no statistical significance was reached. However, when covariates, parent's and child's sex, were investigated, the analysis revealed a significant main effect of nature visits on happiness levels between males and females ($F[4, DF] = 2.543, p = 0.041$). This found a significant association between parents' sex and parent-child nature visits, confirming the similar results gained with Spearman's correlation, indicating that parent-child nature visits differ between parents' sex in the outcome of parental happiness. The analyses did not uncover a significant relationship between the frequency of parent-child nature visits and the child's sex (table 7).

TABLE 7. Tests of Between-Subjects Effects: Education * parent-child nature visits, Tests of Between-Subjects Effects, Parents' sex * parent-child nature visits, Tests of Between-Subjects Effects, Childs' sex * parent-child nature visits on parental happiness.

Source	df	F	Sig.
Parents' highest education	2	0.520	0.596
Parent-child nature visits	5	1.682	0.142
Parents' highest education *			
Parent-child nature visits	9	1.442	0.174
Total	181		
Parent-child nature visits	5	2.253	0.051
Parents' gender	1	1.048	0.307
Parents' gender *			
Parent-child nature visits	4	2.543	0.041
Total	183		
Parent-child nature visits	5	1.839	0.108
Childs' gender	1	0.025	0.837
Childs' gender *			
Parent-child nature visits	5	1.267	0.280
Total	183		

7.2 Physical activity with the family and parents' happiness

A non-significant correlation coefficient ($\rho = -0.014$, $p = 0.856$) was revealed in the analysis conducted with Spearman's correlation between reported PA with family and parental happiness (table 5). Findings revealed a statistically non-significant relationship between these two variables, indicating that time spent physically active with family does not affect parental happiness levels equally. Similarly, a statistically non-significant association between males ($p=0.955$) and females ($p=0.826$) was found when assessing possible differences in family PA and happiness scores between the parents' sexes. Results suggest that neither males nor females have a significant association between family PA and parental happiness (tables 5 and 8).

When descriptive data was observed, there seemed to be a slight variation between male and female participants who engaged with family PA 3-4 times a week and every day (figure 6.), but statistical significance was not reached.

TABLE 8. Parental happiness score distribution between males and females based on the frequency of engaging in physical activity with family.

Family PA (N)	Mean	SD	N
Males			
<i>Less frequently than once a week</i>	5.00	1.10	2
<i>On 1-2 days per week</i>	4.94	1.02	8
<i>On 3-4 days per week</i>	5.81	.83	4
<i>On 5-6 days per week</i>	4.90	.18	2
<i>Every day</i>	4.75	.35	2
Total	5.11	.88	18
Females			
<i>Less frequently than once a week</i>	5.14	1.21	24
<i>On 1-2 days per week</i>	5.15	.92	68
<i>On 3-4 days per week</i>	4.98	.85	48
<i>On 5-6 days per week</i>	5.14	.76	18
<i>Every day</i>	5.42	1.50	7
Total	5.11	.95	165
Total			
<i>Less frequently than once a week</i>	5.13	1.18	26
<i>On 1-2 days per week</i>	5.13	.93	76
<i>On 3-4 days per week</i>	5.04	.87	52
<i>On 5-6 days per week</i>	5.11	.72	20
<i>Every day</i>	5.28	1.34	9
Total	5.11	.95	183

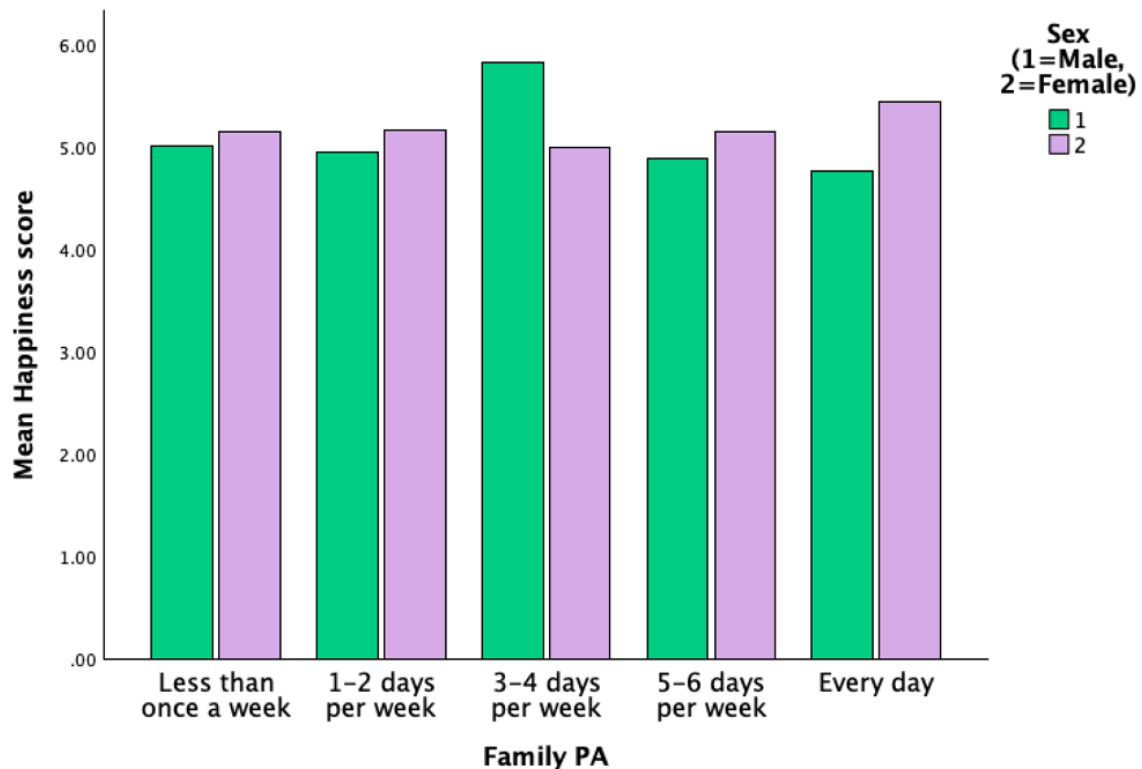


Figure 6. Comparison between males and females in physical activity with family and association to parental happiness.

Covariates, parents' level of education, parents' sex, and the sex of the child were explored to understand their potential influence on PA engagement with family and parental happiness. When investigating the association between family PA and parents' education on parental happiness, results indicate that the combined interaction was not statistically relevant ($F[8, DF] = 0.535, p = 0.829$). No interaction effect was found neither between family PA and parents' sex ($F[4, DF] = 1.031, p = 0.393$) nor family PA and child's sex ($F[4, DF] = 0.580, p = 0.677$) on parents' happiness levels. Findings suggest that neither participating in PA together with family, the parent's educational attainment, nor the parents' or child's sex have an impact on parental happiness levels (table 9).

Statistical significance was not reached when observing the possible differences based on parents' educational level and the frequency of engaging in PA with the family. In the observable data, it seemed that slight variation could be detected as PA frequency with family increased. It seemed that when families engaged in PA 5-6 days per week, parents with lower levels of education (primary- high- or vocational school) reached the highest scores in

happiness, and that parents with medium levels (bachelor's degree or equivalent) or high levels of education (master's degree or higher) attained higher scores in happiness when PA was engaged daily with their family or child (table 9 and appendix 4).

TABLE 9. Tests of Between-Subjects Effects: Education * physical activity with family, Tests of Between-Subjects Effects, Parents' sex * family physical activity, Tests of Between-Subjects Effects, Childs' sex * family physical activity on parental happiness.

Source	df	F	Sig.
Physical activity with family	4	0.190	0.943
Parents' highest education	2	0.047	0.954
Physical activity with family *			
Parents' highest education	8	0.535	0.829
Total	181		
Physical activity with family	4	0.381	0.822
Parents' sex	1	0.108	0.743
Physical activity with family *			
Parents' sex	4	1.031	0.393
Total	183		
Physical activity with family	4	0.077	0.989
Childs' sex	1	3.030	0.084
Physical activity with family *			
Childs' sex	4	0.580	0.677
Total	183		

7.3 Place of residence and parent-child nature visits

Major differences were not found between participants' place of residence and parent-child nature visits. The majority of the participants in urban and rural living areas visit nature at least monthly (N=158, 86.3% of the participants). Over half of urban residents 50 (58.7% of urban residents) and rural residents 50 (58.1% of rural residents) visited nature with their child 1-2

times per week or more. Differences between the place of residence and parent-child nature visits were investigated with a chi-square test, where analysis revealed a slightly greater p-value ($p=0.053$) than the significance level (0.05). Findings conclude that no significant differences exist between place of residence (urban vs. rural) and parent-child nature visits (table 10). When observing the descriptive data on the distribution of nature visits between urban and rural participants, it seemed that slight variation could be noticed with the higher frequencies of parent-child nature visits, as only rural residents engaged in parent-child nature visits daily ($N=7$, 7.1% of rural residents) (table 10).

TABLE 10. Cross tabulation and chi-square: place of residence and parent-child visits in nature.

Parent-child visits in nature	Urban N (%)	Rural N (%)
<i>Less than once a month (1)</i>	6 (7.1%)	6 (6.1%)
<i>1-3 per month (2)</i>	29 (34.1%)	35 (35.7%)
<i>1-2 per week (3)</i>	36 (42.2%)	29 (29.6%)
<i>3-4 per week (4)</i>	10 (11.8%)	19 (19.4%)
<i>5-6 per week (5)</i>	4 (4.7%)	2 (2.0%)
<i>Daily (6)</i>	0 (0.0%)	7 (7.1%)

$\chi^2 (5) = 10,91$; $p=0,053$; $N=183$

Two-way ANOVA investigated possible differences between male and female participants in urban and rural areas and parent-child nature visits. Non-significant combined interaction effect ($F[1, DF] = 0.001$, $p = 0.981$) as evidence suggest that the frequency of parent-child nature visits did not differ between male and female participants based on their place of residence (table 11).

TABLE 11. Tests of Between-Subjects Effects: Place of residence * parents' sex based on parent-child nature visits.

Source	df	F	Sig.
Place of residence	1	0.607	0.437
Parents' sex	1	0.017	0.897
Place of residence *			
Parents' sex	1	0.001	0.981
Total	183		

8 DISCUSSION

This master's thesis primarily examines the associations between parent-child nature visits and parents' happiness. Secondly, the associations between physical activity engaged with parent-child or the whole family and parents' happiness, and the connection between the living environment (urban vs. rural) and parent-child nature visits are investigated.

8.1 Main results

Since movement in nature supports wellbeing and health, it was assumed that more parent-child nature visits were associated with greater parental happiness (H1). A positive correlation between parent-child nature visits and parental happiness confirmed the first research hypothesis. Results indicate a positive association between more frequent parent-child nature visits and increased parental happiness. However, it is essential to acknowledge that several other factors may also influence this observed correlation.

When the relationship between family PA and parental happiness was investigated, a significant relationship was not proved, indicating that the second research hypothesis was rejected. Neither the third hypothesis gained support, as findings suggest no difference between participants from urban or rural regions and parent-child nature visits engaged.

8.1.1 Nature visits and parental happiness

Visiting nature can positively impact both short-term and long-term health and wellbeing. In the long run, the natural environment positively impacts mental illness risk factors (Bratman et al. 2015; Brito et al. 2022), but also the short-term effects in nature have been proven to reduce negative emotions (Bowler et al. 2010; Pasanen et al. 2014) and improve mood (Barton & Pretty 2010; Brito et al. 2022; Puhakka 2021). Based on these earlier findings, it was assumed that as parent-child nature visits increase, parents also experience more happiness.

Previous studies have found that parents have become happier in recent years. This phenomenon has been explained by children's capability to keep parents involved in their

society. Social experiments in socially rich environments positively affect wellbeing and connectedness to other people (Herbst & Ifcher 2016). Nature visits are one way to stay connected to surrounding areas and meet other people in natural settings. In this study, more frequent visits to nature together with a child also increased the parent's happiness levels linearly.

Happiness is a subjective state of mind, so the results gained in this study need to be evaluated cautiously because some people are more capable of describing and understanding their emotions than others. Also, the perceptions of being happy or having a happy life are affected by several factors, like cultural expectations (Lyubomirsky & Lepper 1999), which could influence research results concerning parental happiness. Previous studies had also recognised the shortage of time as one of the primary obstacles to engaging in physical activities together with family (Brown et al. 2015), which might be one cause that parents' happiness scores peaked when families visited nature 5 to 6 times per week but decreased slightly when nature visits become daily. Increased stress levels may explain this slight decrease in parents' happiness levels due to lack of time.

Parents' educational attainment did not impact the association between participants' reported nature visits and happiness levels in this study. Findings contradict previous findings, proving that well-educated parents also experience more happiness (Myrskylä & Margolis 2014). Some slight variations were observed in the descriptive data when the frequency of nature visits was under examination. Participants with lower education levels seemed to visit nature more daily than participants with higher levels of education. Still, a statistical significance was not reached in this study, so results contradict earlier findings, which prove that a lower education level is associated with more regular visits in nature with the family (Kokkonen et al. 2021b). However, as parents participating in this study were mostly highly educated (N=135, 73.7% with bachelor's degree or higher), it can be challenging to interpret significant differences between participants' educational levels in this study.

Contradictory results were also found when investigating the differences between sexes, as previous happiness studies suggest that women, the elderly, and parents of young children spend the most time in nature (Pyky et al. 2019). No difference between male and female participants and their nature visits was found in this study. However, according to previous studies, women have proved to be more satisfied with their life (Pew Research Center, 2014;

Biedenweg et al. 2017), which was supported in this study as the positive association between parent-child nature visits and parental happiness was proved among females. Because women tend to experience more happiness in general, according to previous studies, female participants in this study might have also experienced more happiness already before study participation. Another factor leading to differences between parents' sexes and their happiness levels may have been the non-equal distribution between male and female participants (Females N=165 and Males N=18). Because of this small sample size for males (N = 18), findings should be cautiously approached. Further research with equal samples of both sexes could provide more reliable insights into potential differences between sexes.

Previous research has demonstrated that spending time actively in nature can alleviate negative emotions and prevent depression compared to indoor settings (Hartig et al. 1991). Earlier findings gained support in this study as parents who visited nature more frequently also experienced more happiness. Earlier studies demonstrate that children spend less time outdoors than before (Kempe et al. 2016). However, participants in this study engage in nature with their children frequently, which can positively influence the results between parent-child nature visits and parents' happiness in this study. Still, considering the limited size of the study population, future research should aim to replicate these findings with a larger sample to ensure the generalisation and reliability of the results.

8.1.2 Physical activity with the family and parental happiness

According to the Family Exercise Barometer 2021, most Finnish families (92%) engage in family exercise, and 50% of the families regularly move at least once a week together (Suomen Latu 2024). These results were confirmed in this study as about 40% (N=76) of the participants reported engaging in PA with their family or child at least 1-2 times per week. Previous studies also suggest that happiness is associated with more PA (Zhang & Chen 2019). These results did not gain support in this study, as more frequent family PA did not lead to higher parental happiness. However, contradictory results might have been found as parents' own PA engagement and PA levels (lower or higher intensity) were not investigated in this study. Family PA can be lower in intensity, which may affect the connection with parental happiness, which may not be the same as between the parent's own PA engagement and happiness.

Contradictory results have been brought up from previous studies investigating PA and happiness. While some studies provide evidence that PA can have a positive association with happiness, other studies show the opposite (Richards et al. 2015). Also, the difference between active and very active individuals and their happiness levels has not been found (Zhang & Chen 2019). Results found in this study confirm these earlier findings, as no significant difference between active and very active families and their happiness levels was found. However, previous studies suggest that the difference in happiness levels could be seen already between one exercise done per week compared to none per week (Zhang & Chen 2019). Similar results were proved in this study as a slight increase in happiness levels can be seen between participants who engage in PA with their family less than once a week and those who engage in PA with their family 1-2 days per week. In addition, a slight decrease in parental happiness was found when families engaged with PA more than five times per week. As lack of time (Brown et al. 2015) and limited resources (Suomen Latu 2024) are recognised barriers to engaging PA with a family, those factors might be experienced in this study population, causing a decrease in perceived happiness for parents who try to engage family PA over five times each week.

When investigating the association between family PA, parents' educational attainment, and parents' and children's sexes on parental happiness, findings suggested that neither participating in PA together with family, the parent's educational attainment, nor parents' or children's sex have an impact on parental happiness levels. Non-equal distribution between sexes decreases the reliability of these results and may be why no differences between parents' sexes were found. As the relationship between parent-child nature visits and family PA was investigated, results confirmed that when the frequency of nature visits increased, family PA also tended to increase. Time spent in nature is usually active, which explains this positive association between parent-child nature visits and the frequency of family PA.

8.1.3 Place of residence and nature visits

Sociodemographic factors were under investigation as earlier studies suggest that younger children in the family and lower education attainment of parents are connected to more regular visits in nature together with the family (Kokkonen et al. 2021b). Because living environment has been found to influence people's nature engagement and living close to nature can increase

PA (Pretty et al. 2003), it was assumed that parents who live closer to nature (rural areas) will also spend more time together with their child in nature (H3). In this study, only assumptions can be made based on place of residence and parent-child nature visits, as no statistical difference was found between the living areas and parent-child nature visits. However, in this study, both urban and rural areas in Southern Finland were quite close to each other (in about a 100 km radius), which may affect that no differences were found in this study between urban and rural living areas. Results should be interpreted with care.

In this research, the majority of the participants in both urban (N=36, 42.2%) and rural (N=29, 29.6%) living areas visited nature 1-2 times per week. Even though no significant differences were found between urban and rural participants and the frequency of parent-child nature visits, in descriptive data, it seemed that slight variation could be noticed between urban and rural participants in the higher frequencies of parent-child nature visits. In urban areas, none of the participants visited nature daily with their children, but almost 10% (N=7, 7.1%) of the rural participants visited. Previous studies suggest that PA can increase when nature is easily reachable (Kokkonen et al. 2021a) and people live close to nature (Pretty et al. 2003). Because none of the participants in urban areas, but almost 10% of the participants in rural areas, spent time in nature daily, it could be assumed that nature areas were more accessible to access in rural areas. Earlier studies have also found that the main differences between urban and rural areas in the PA engagement point of view are parks and streets as a place to engage PA (Parks et al. 2003). In this study, the living surroundings were not examined, so it is impossible to accurately examine the environment and its effects on nature visits. However, environments should be planned so that everyone can access nature easily despite where they live, and families should be informed about the opportunities nature offers for them (Kokkonen et al. 2021a) to increase families' engagement with nature.

Prior research has indicated that women typically dedicate more time to nature (Pyky et al. 2019). However, no difference between male and female participants' nature visit frequency was found in this study. The non-equal distribution between males and females could have influenced the results. Also, only one of the parents answered the study questionnaire, but both parents could still participate in the nature visits with their children, which could influence the results.

Outdoor activity statistics show that families with young children (0-6-year-old) spend more time together in nearby nature areas than families with older children (7-16-year-old) (Neuvonen & Sievänen 2011). In this study, participants' children were 3-4 years old, which can explain the family's frequent nature visits and confirm similar results according to nature engagement in this study. Earlier research findings also suggest that living close to nature is associated with happiness (Van Herzele & de Vries 2012; Pasanen et al. 2014). However, this study did not support the same association. In addition, only the place of residence (urban vs. rural) was investigated in the study, which does not necessarily mean that participants residing in rural areas are directly living closer to nature compared to those in urban areas.

8.2 Reliability and ethics

Participants were provided with the necessary details, enabling them to make decisions regarding their participation in the study. All parents/caregivers signed a consent form when taking part in the study. The information sheet and consent form detailed the study's procedures, objectives, and possible benefits and risks. Study participation was voluntary, and participants could withdraw from the study whenever they wanted. Possible risks faced during the study include handling of personal data. However, to maintain privacy and confidentiality, necessary steps were taken to minimise those risks.

To maintain the privacy and confidentiality of the participants, all directly identifiable personal data (e.g., contact details) have been stored in a separate database, and all data have been pseudonymised by encoding. Encoded data cannot be linked to a specific individual without a code key, which is kept behind restricted access in a separate server. Only the specified persons of the research group can access any information about this research (Enberg et al 2024). The data for the master's thesis were obtained from Folkhälsan anonymously.

The SUNRISE Finland study protocol in public ECEC centres across Southern Finland allowed children with different socioeconomic backgrounds, genders, and nationalities to participate in the study. Investigating the association between the parent and child spending time together in nature and the differences between rural and urban regions will further provide data on possible differences in regional areas and take action to improve equal opportunities if necessary.

Participants were provided with the researchers' contact information for the research. The SUNRISE Finland research protocol was evaluated by The Folkhälsan Research Center's Ethical Review Board in Humanities (FH1/2022_0703) (Enberg et al. 2024). During this Master's thesis process, good scientific practice has been followed as defined by the Research Ethics Advisory Board (TENK 2023). Throughout the process, the presentation of the results and their recording were conducted carefully and confidentially. The work of other researchers has been respected with appropriate references.

8.3 Strengths and limitations

The cross-sectional study enables to examine the current situation, which gives an understanding of the studied phenomenon at this moment. However, it is not possible to explore changes in parental happiness and parent-child nature visits, as well as PA with the whole family longitudinally. This means that possible changes in the study population's perceptions of happiness, nature visits or PA behaviour in the longer term cannot be seen. In addition, it was not possible to determine causality between the studied variables.

Correlation analyses were performed for data consisting of 183 individuals. This sufficiently large sample size provides reliability for the research findings, allowing precise estimates and firm conclusions. However, participants were not equally distributed as there were 165 females and 18 males, which is one limiting factor affecting gained results. According to this, firm conclusions based on the parents' gender cannot be made when examining parental happiness. Equally distributed research groups in males and females guarantee a more reliable sample in future studies.

The SUNRISE Finland study took place in public ECEC centres in Helsinki and surrounding rural areas, and about 50% from urban and 50% from rural areas were recruited. This allowed to involve parents and children of different origins, genders, and socioeconomic backgrounds, which enhanced the accuracy of the participating population. However, the data collection was only done in Helsinki and its surrounding rural areas in Southern Finland, so results cannot be generalised to the whole population.

Information letters, questionnaires and consent forms were provided in Finnish, Swedish and English in printed and digital versions. The self-administered questionnaire was used to maintain accuracy and avoid information bias compared to a researcher-influenced interview. However, when measuring happiness through self-reported questionnaires, there is a chance of bias due to the perception of self. Some people can overestimate their happiness according to the expectations of their culture, for instance. Some people also do not feel happy even though everything in their life seems to be good. Happiness also means different things to different people. For instance, in the United States, happiness is associated with a satisfying career, home ownership, marriage and raising kids. In contrast, in some other cultures, spiritual salvation and true love are more valued when it comes to happiness (Lyubomirsky & Lepper 1999).

8.4 Conclusions and action proposals

Results proved a positive association between more frequent parent-child nature visits and better parental happiness. The increased number of parent-child nature visits may increase parents' happiness, and/or parents' happiness increases the number of parent-child nature visits. However, based on this research, the same positive connection was not found between family PA and parental happiness. Also, differences between the place of residence and parent-child nature visits were not found. However, as childhood nature visits can last till adulthood, and time spent in nature may positively affect happiness, nature visits should be emphasised in future interventions and projects aimed at families. Nature visits and PA in nature are ways to promote wellbeing, which is why promoting activities in nature throughout a lifetime should be emphasised to increase nature engagement.

By examining the associations between parent-child nature visits and family PA and parental happiness, this master's thesis aims to contribute new insights to the study field. These findings will not only explain the intricate relationship between family activities in natural settings and parental happiness but also provide valuable guidance for promoting family wellbeing and engagement in nature-based activities. That being said, the results gained with this study can help healthcare professionals to consider more effectively the effects of nature visits with parents and children as part of promoting wellbeing and happiness. PA in natural settings and nature visits are one way to promote wellbeing already from early childhood. Research findings

of this master's thesis will help plan future studies to explore the relationship between nature and parental happiness.

8.5 Future research

Happiness can be various things to different individuals, but it brings health and wellness to everyone. As nature has a remarkable impact on happiness, nature should be emphasised more in future family-based interventions starting from an early age. Also, because parents affect how their children interact with nature, research on barriers towards nature needs to be conducted to understand why people do or do not engage with nature.

Sociodemographic factors are connected to families' nature visits, and they should be considered when planning future interventions for families with children that support movement in nature. Intervention should be scheduled outside working hours so both parents and children can take part in them together. Also, demographic factors should be supported more so that conclusions about their effects on happiness can be drawn.

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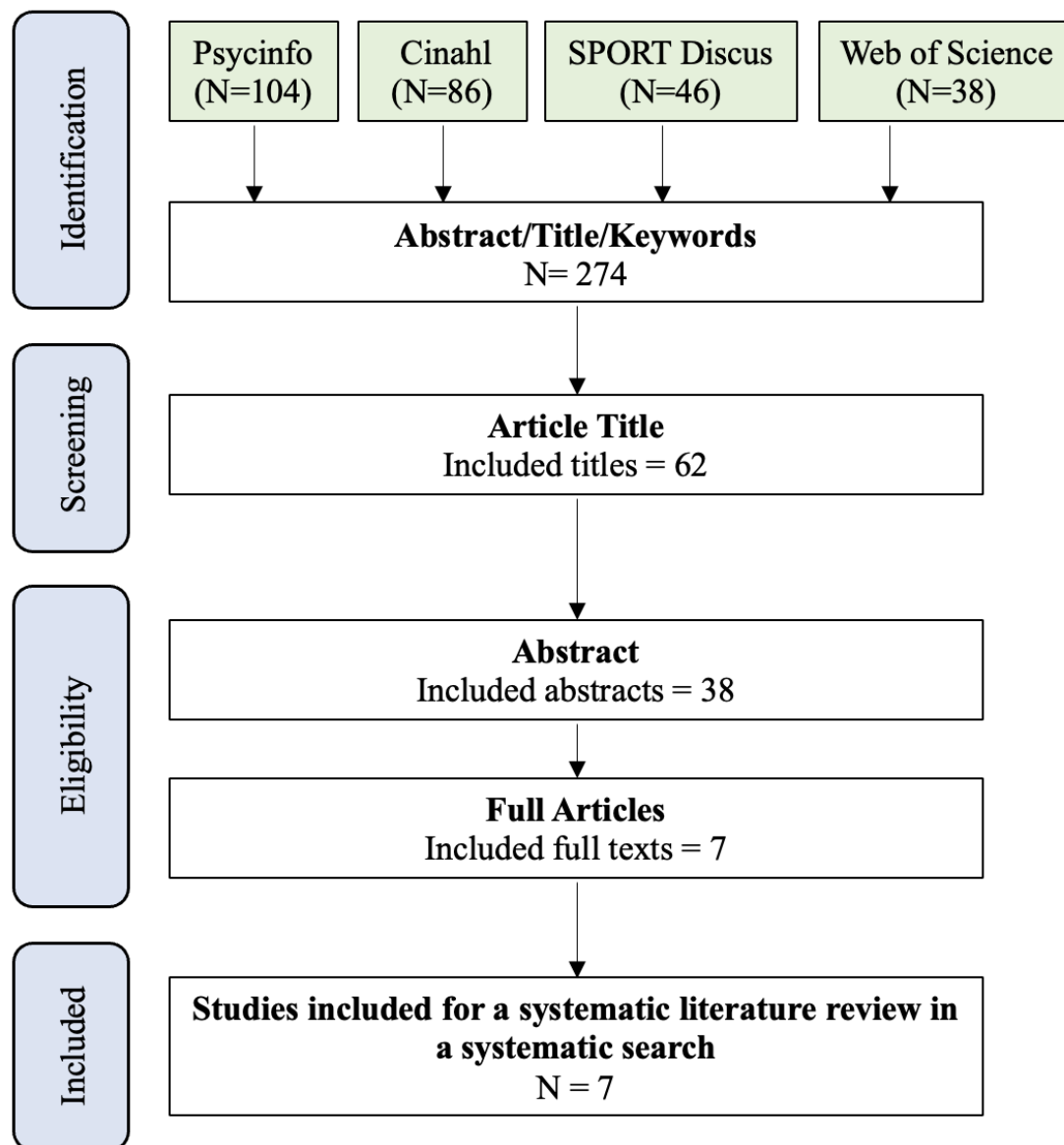
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APPENDIX 1. Description of the systematic literature search.

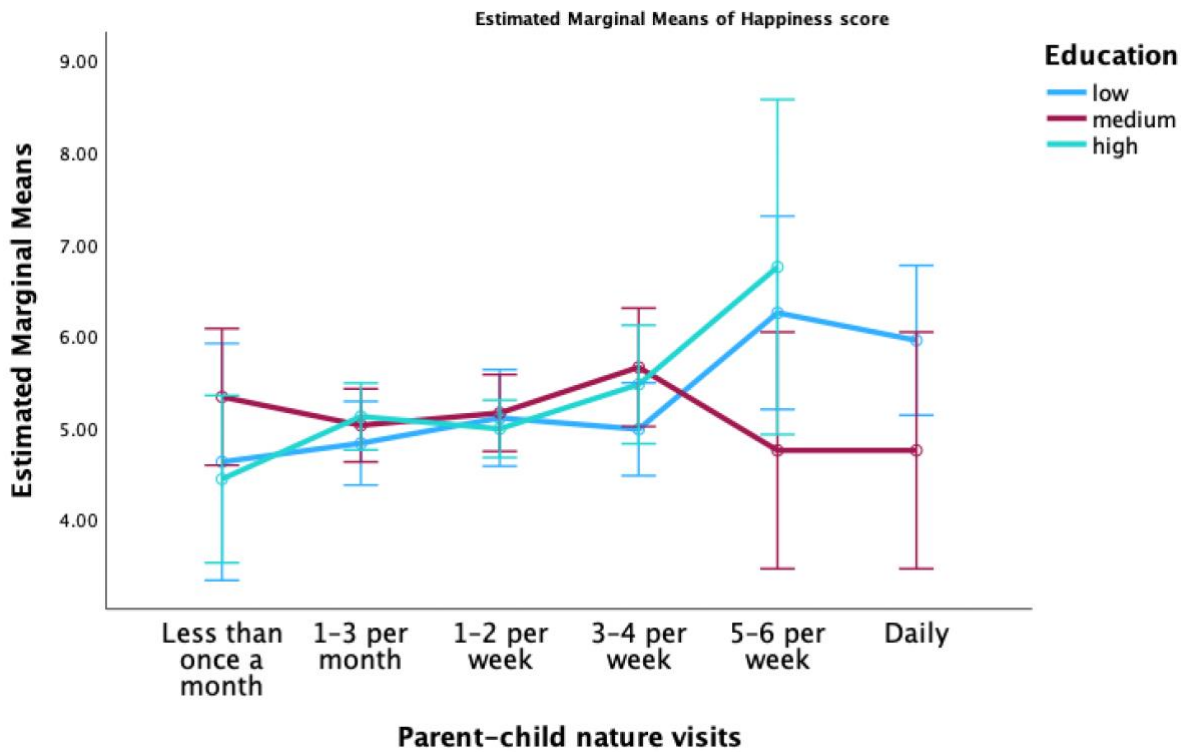


APPENDIX 2. Reliability assessment of research articles using the adapted STROBE checklist.

Quality criteria		Kelle y ym. 2022	Besikci ym. 2019	Thompson Coon ym. 2011	Brito ym. 2022	Puhakka 2021	Pasanen ym. 2014	Biedenwo ym. 2017
Title and abstract	(a) Indicate the study's design with a commonly used term in the title or the abstract	✓	✓	✓	✓	✓	✓	✓
	(b) Provide in the abstract an informative and balanced summary of what was done and what was found	✓	✓	✓	✓	✓	✓	✓
Introduction								
Background/rationale	Explain the scientific background and rationale for the investigation being reported	✓	✓	✓	✓	✓	✓	✓
Objectives	(a) State specific objectives,	✓	✓	✓	✓	✓	✓	✓
	(b) prespecified hypotheses	-	✓	✓	-	-	✓	✓
Methods								
Study design	Present key elements of study design early in the paper	✓	✓	✓	✓	✓	✓	✓
Basic information of the study	Information like settings and data collection	✓	✓	✓	✓	✓	✓	✓
Variables	Define outcomes, exposures, predictors, potential confounders, and effect modifiers	-	✓	✓	✓	✓	✓	✓

Results								
	Results presented	✓	✓	✓	✓	✓	✓	✓
Participants	Number of individuals reported	✓	✓	-	-	✓	✓	✓
Descriptive data	(a) Give characteristics of study participants	✓	✓	-	-	✓	✓	✓
	(b) Summarise follow-up time							
Outcome data	Report numbers of outcome events or summary measures	✓	✓	✓	✓	✓	✓	✓
Main results	Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval)	✓	✓	-	✓	✓	✓	✓
Discussion								
Key results	Summarise key results with reference to study objectives	✓	✓	✓	✓	✓	✓	✓
Limitations	Limitations of the study, taking into account	✓	✓	✓	✓	✓	✓	✓
Interpretation	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and	✓	✓	✓	✓	✓	✓	✓

APPENDIX 3. Parent-child nature visits and parents' highest education association with parental happiness.



APPENDIX 4. Physical activity with family and parents' highest education association with parental happiness.

