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The Process of Change in Patterns of Daily Occupations among Parents of Children with Obesity - Time use, family characteristics and factors related to change

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Department of Health Sciences/Occupational Therapy and Occupational Science
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– Time use, family characteristics and factors related to change

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by

Kristina Orban

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Abstract

This thesis provides new insights into parents' patterns of daily occupations. It proceeds from the basis of an occupational perspective on family life, using an occupational lens to understand how, when and where individuals spend their time. In recent decades, lifestyles have changed worldwide and the transition into an increasingly sedentary lifestyles is a major health concern, the origins which can be traced to childhood. The overall aim of this thesis was to explore the shared patterns of daily occupations among parents of preschool-age children with obesity, and to investigate whether it was possible for parents to change the amount of time they spent with their children and the parents' occupational value over the course of a one-year intervention. Factors related to any change in the parents' time use as well as any change in the children's BMI z-score, were also investigated. The first study had a qualitative approach. This study investigated the usefulness of the time-geographical diary method in facilitating reflections on how patterns of daily occupations occur and change over time. The diary method enabled the participants to reflect on and become aware of changes relevant to explaining their reasons for engaging in daily occupations in the way that they did. The second study had a quasi-experimental design in the context of a one-year intervention within the framework of an RCT and consisted of three papers. In Paper II, daily occupations among parents of children with obesity were investigated. Four main family types were identified, the shared patterns of daily occupations differed between each type in terms of the division of household work, paid work and the amount of time spent together as a family. In Paper III an increase over time was seen in the time parents spent together with their children and the parents' perceived occupational value, along with a subsequent decrease in the children's BMI. In Paper IV, factors associated with changes in the parents' time use during the intervention turned out to be the parents' finances and satisfaction with everyday occupations as well as the parents' BMI and low sense of control at inclusion. The fathers' perceptions of occupational values, education and their subjective health, and the mothers' high sense of control and subjective health explained 67% of the variance in the children's change in BMI. The findings may lead to a greater understanding of how parents shared patterns of daily occupations are shaped within the family. Together with the contributing factors for predicting change, this should be addressed in the context of the family in order to create further knowledge regarding the development of family-based interventions with an aim of child health promotion.

Key words

Occupational therapy, time-geographical diaries, occupation-focused approach, childhood obesity, parents, shared patterns of daily occupations, health promotion

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"Changing patterns of life, work and leisure have significant impact on health. Work and leisure should be a source of health for people"
WHO, Ottawa Charter for Health Promotion, 1986

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Abstract

This thesis provides new insights into parents' patterns of daily occupations. It proceeds from the basis of an occupational perspective on family life, using an occupational lens to understand how, when and where individuals spend their time. In recent decades, lifestyles have changed worldwide and the transition into an increasingly sedentary lifestyles is a major health concern, the origins which can be traced to childhood. The overall aim of this thesis was to explore the shared patterns of daily occupations among parents of preschool-age children with obesity, and to investigate whether it was possible for parents to change the amount of time they spent with their children and the parents' occupational value over the course of a one-year intervention. Factors related to any change in the parents' time use as well as any change in the children's BMI z-score, were also investigated. The first study had a qualitative approach. This study investigated the usefulness of the time-geographical diary method in facilitating reflections on how patterns of daily occupations occur and change over time. The diary method enabled the participants to reflect on and become aware of changes relevant to explaining their reasons for engaging in daily occupations in the way that they did. The second study had a quasi-experimental design in the context of a one-year intervention within the framework of an RCT and consisted of three papers. In Paper II, daily occupations among parents of children with obesity were investigated. Four main family types were identified, the shared patterns of daily occupations differed between each type in terms of the division of household work, paid work and the amount of time spent together as a family. In Paper III an increase over time was seen in the time parents spent together with their children and the parents' perceived occupational value, along with a subsequent decrease in the children's BMI. In Paper IV, factors associated with changes in the parents' time use during the intervention turned out to be the parents' finances and satisfaction with everyday occupations as well as the parents' BMI and low sense of control at inclusion. The fathers' perceptions of occupational values, education and their subjective health, and the mothers' high sense of control and subjective health explained 67% of the variance in the children's change in BMI. The findings may lead to a greater understanding of how parents shared patterns of daily occupations are shaped within the family. Together with the contributing factors for predicting change, this should be addressed in the context of the family in order to create further knowledge regarding the development of family-based interventions with an aim of child health promotion.

Thesis at a glance

The Process of Change in Patterns of Daily Occupations among Parents of Children with Obesity – Time use, family characteristics and factors related to change	
Paper I	Using a time-geographical diary method in order to facilitate reflections on changes in patterns of daily occupations
Aim	To investigate the usefulness of a time-geographical diary method, combined with stimulated-recall interviews, in order to facilitate reflections.
Results	The method enabled the informants to reflect on and become aware of changes which were relevant to explaining the reasons for engaging in occupations in the way that they did. The main theme "new insights came to light concerning the scope of patterns of daily occupations" was derived from four categories describing awareness of daily routines.
Conclusion	Time-geographical diaries may be useful in research and in clinical practice to support individuals in establishing a healthier lifestyle.
Paper II	Shared patterns of daily occupations among parents of children aged 4-6 years old with obesity
Aim	To identify characteristics of shared patterns of daily occupations in families, and investigate if and to what extent mothers' and fathers' time use varies.
Results	Parents' patterns of daily occupations differed concerning how parents (couples) divided family projects between themselves. Four main groups of family types were identified. Mothers spent, to a large extent, more time together with their children than fathers did.
Conclusion	The findings generated a new understanding of how parents' shared patterns of daily occupations are shaped in families. Such knowledge may contribute to and enhance our understanding of why change may be hard to accomplish.
Paper III	Changes in parents' time use and its relationship to child obesity
Aim	To explore any changes in the amount of time parents spent together with their children over the course of a one-year occupation-focused intervention. Explore variations among four groups of family types and between mothers and fathers. Explore changes in parents' perceived occupational value and children's BMI z-score and if change in BMI varied according to family type.
Results	The amount of time parents spent together with their children during weekdays and their perceived occupational value increased. Fathers time use increased especially on weekdays during 7-9 months. Parents in two of the four family types increased their time use and the children's BMI decreased in three of the family types.
Conclusion	If parents are encouraged to be engaged in co-occupations which involve their children, and family strengths are identified, it may have a long-term positive impact on children's weight.
Paper IV	Factors associated with parental opportunities for time use change in daily activities and children's subsequent decrease in BMI
Aim	To explore factors related to any change in parents' time use as well as any change in children's BMI z-score respectively, during a one-year occupation focused intervention.
Results	Factors associated with the parents' time use change were; adequate finances, low mastery at inclusion, satisfaction with everyday activities and parents BMI. Fathers' increased perception of occupational values, mothers' high mastery at inclusion, parents' high self-rated subjective health and fathers with a university education predicted children's BMI decrease.
Conclusion	The findings can be considered as an attempt to enable an understanding of factors of importance when designing family interventions. Fathers' involvement in children's daily activities seems to predict a positive outcome in both time use and children's BMI. Involving both parents in occupation-focused family interventions should be emphasised.

Abbreviations

BMI	Body Mass Index
CHC	Child Health Care
CONSORT	Consolidated Standards of Reporting Trials
ICF	International Classification of Functioning and Health
ICF-CY	International Classification of Functioning and Health. Children and Youth
IOTF	International Obesity Task Force
PA	Physically active occupations
PiA	Physically inactive occupations
PM	Preparing and having meals
OECD	Organisation for Economic Co-operation and Development
OVal-pd	Occupational Value instrument with pre-defined items
RCT	Randomized controlled trial
SPSS	Statistical Package for the Social Sciences
THU-5	Targeted Hassles and Uplifts
WHO	World Health Organization

Definitions

Activity: An observable unit of behaviour, and recognisable sequence of actions taken together in a particular context; beyond tasks, yet without the complexity of occupations (Christiansen & Townsend, 2010).

Areas of occupation: Various kinds of activities of everyday life.

Co-occupation: Involves the active participation of two or more individuals.

Ecology: The scientific study of organisms in their natural environment, including the relationships of different species to each other and to the environment (Wilcock, 2006).

Family: A social unit where all members in some way influence each other.

Habit: A customary way of acting in a certain way, without conscious attention.

Health promotion: The process of enabling people gain increased control over, and to improve their health (WHO, 1986).

Intervention: Ongoing actions taken to support improved client performance.

Mastery: Proficiency in successfully dealing with the challenges of living.

Occupation: All that people need, want or are obliged to do (Wilcock, 2006).

Parent: The adult living with the child, most often the biological parent but it may also refer to a stepparent.

Parents' shared patterns of daily occupations: The time each parent spends on different occupations distributed between the parents in time and space.

Pattern of daily occupations: A pattern built up of building blocks in the shape of all occupations and sleep performed by one individual during one day and one night, in a 24-hour cycle (Erlandsson, 2003).

Physical activity: Bodily movements produced by skeletal muscles, which results in significantly more energy utilisation than when the child is resting (Bouchard, Shepard, & Stephens, 1993).

Project: Activities which relate to each other in that they have the same goal.

Public health: The health of the population as a whole.

Routine: A regular pattern of occupation.

Temporality: The temporal aspects of occupations which contribute to the patterns of daily occupations are the rhythm, tempo, synchronisation, duration and sequence woven together (Larson & Zemke, 2003).

Time use: How humans allocate time through activity and occupation.

Well-being: The affect or emotion about one's psychological, emotional, or physical state as perceived at a given moment (Christiansen & Townsend, 2010).

Work-family balance: Perceived satisfaction (or not) regarding the management of individual and family time.

Z-score: A standard score indicating how many standard deviations an observation is above or below the mean.

List of Publications

This thesis is based on the following papers. They are referred to in the text by their Roman numerals:

I. Orban, K., Edberg, A.-K., & Erlandsson, L.-K. (2012). Using a time-geographical diary method in order to facilitate reflections on changes in patterns of daily occupations. *Scandinavian Journal of Occupational Therapy,* 19 (3), 249-259.

II. Orban, K., Ellegård, K., Thorngren-Jerneck, K., & Erlandsson, L-K. (2012). Shared patterns of daily occupations among parents of children aged 4-6 years old with obesity. *Journal of Occupational Science*, 19(3), 241-257.

III. Orban, K., Edberg, A-K., Thorngren-Jerneck. K., Önnerfält, J. & Erlandsson, L-K. *Changes in parents' time use and its relationship to child obesity*. Manuscript submitted for publication.

IV. Orban, K., Edberg, A-K., Thorngren-Jerneck. K., Önnerfält, J. & Erlandsson, L-K. *Factors associated with parental opportunities for time use change in daily activities and children's subsequent decrease in BMI*. In manuscript.

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Rationale

This thesis uses an occupational perspective of family life and society in order to seek answers about occupations' influence on the promotion of health and well-being. Concerns have been raised around the globe about the increasing health risks which can be traced back to, amongst other things, the decreasing amount of time that individuals spend engaged in physically active occupations. Children's lifestyles have changed in large parts of the world over recent decades, resulting in issues including the increasing prevalence of obesity. Childhood obesity is considered one of the most serious health challenges of the 21st century.

Empirical studies have confirmed that occupations are a prerequisite for health (Clark et al., 1997; Clark et al., 2012). Preventing illness by 'doing' is a holistic occupation-focused approach with a foundation in the belief that people are occupational beings (Wilcock, 2006). Children's participation in daily occupations is an important aspect of their development, health and well-being. Patterns of doing are acquired in early life, and how children spend their time is strongly influenced by their parents and siblings. The habits of young children are formed when imitating the behaviours of others in their environment. Children's need to engage in co-occupations that have a positive influence on their well-being and physical health, in order to meet the needs of children who are at risk for subsequent health problems, is one of the basic principles of this thesis. How such social coordination of occupations is achieved in families; among parents and their children, is for the most part, unknown. Therefore, it is important that this will be explored.

Introduction

An occupation-focused approach

Research evidence supports there being a relationship between occupation, health and well-being (Law, Steinwender, & Leclair, 1998). The challenge that many parents of young children face in their everyday life is that of balancing the time available to include and create conditions that promote the health of the whole family. This thesis is based on an occupational perspective of family life and society. Occupation includes more than engagement in work; a variety of occupations comprise the everyday life of an individual, a family, a community, an organisation, or a society (Christiansen & Townsend, 2010). Clark (2002) defines an occupation as a way of spending time, which is distinct from an activity, i.e. the action a person does. Occupation is defined as being units of actions that have identifiable starting- and end-points. It is performed consciously and intentionally and is meaningful to the performer (Clark, 2002).

Preventing illness by 'doing' is a holistic occupation-focused approach with a foundation in the belief that people are occupational beings (Wilcock, 2006). According to Wilcock (2006) occupation is "all the things that people need, want, or are obliged to do" (p.343) in their daily lives. Children's participation in daily occupations is, thereby, an important aspect of their health, well-being and development (Primeau, 2004).

Patterns of daily occupations

Parents shape their interactions with their children to meet the needs of their family by creating and maintain daily routines that are sustainable. However, many families struggle with the multiple demands of accommodating both the schedules of working parents and the needs of their children. Today, more than ever, parents are faced with the dilemmas involved in balancing paid work and household work in order to both support their family financially and nurture their children physically and psychologically (Primeau, 2000b). Patterns of occupations (habits and routines) acquired early in life are often maintained unconsciously (Wilcock, 2006), and how children spend their time is strongly influenced by family culture and local customs (Law, Petrenchik, Ziviani, & King, 2006). According to the ecological theory, the cultural identity of a

family is transmitted to the child through family routines and rituals (Weisner, 2002), therefore, studying family routines places a focus on the whole family process, allowing access to how the family as a group is organised and finds meaning as a collective unit (Fiese et al., 2002). It is well known that the occupations people choose influence their lifestyle, their productivity, their social relationships, and their health and well-being (Christiansen & Townsend, 2010). This thesis proceeds from an occupational perspective of family life, it targets parents' continuum of doing to establish an understanding of how, when, where and with whom individuals spend their time.

Occupations that are performed on daily basis can be described as patterns of daily occupations, this includes those that provide the fabric for structuring everyday life and how it is experienced (Erlandsson, 2003). A pattern of daily occupations is defined as "a pattern built up of building blocks in the shape of all occupation [including sleep] performed by one individual during one day and one night, in a 24-hour cycle" (Erlandsson , 2003, p.17). If or when a family needs strategies to support a change in their lifestyle, an understanding of the parents' priorities and challenges is, most probably, an important factor which can be used to build upon existing knowledge about how such support is designed. The building blocks of daily occupations, their temporal order and structure, and how and why they are experienced are complex phenomena, not commonly understood. An occupation focused approach is applied in this thesis in order to make the impact of patterns of daily occupations more understandable for parents of children with obesity, with the aim of enabling enduring changes, which promote health, in the family's daily life.

Occupational therapy and health promotion

Occupational risk factors have been recognised and considered in occupational therapy practice; according to the International Classification of Functioning, Disability and Health (ICF), consequences of a limitation in body functions and activity may lead to a limitation of the ability to participate in society. The increased risk of developing chronic diseases, such as obesity, may be the result of childhood lifestyle. It is assumed that people have the ability to influence their own health by engaging in occupations that are, for them, meaningful (Yerxa, 1998). The occupation-focused public health approach provides ideas about the relationship between occupation and health. This occupational perspective respects and complements the medical approach to health (Wilcock, 2006). It also represents a different way of understanding health in the light of how, what, and why people spend time and effort in "doing, being, and becoming" (Wilcock, 2006, p.181) through engagement in occupations. A primary focus of this thesis is the 'doing' in families; through 'doing' children develop skills and self-identity, which, in turn, leads to their 'being' and 'becoming' (Wilcock, 2006). This perspective of people as occupational beings means that people can not only become well through doing, but also ill though doing.

The World Health Organization (WHO) has begun to address occupational issues of health, e.g. in documents such as "Global strategy on Diet, Physical Activity and Health" (WHO, 2004). Among the major global risk factors identified by the WHO (2009) is the significant change in dietary habits and physical activity levels worldwide. Physical inactivity is a major concern as it is becoming more prevalent in most societies throughout the world (WHO, 2012). Physical activity has become, for the most part, a recreational option, but differences between groups, according to ethnicity, society, culture, education, employment and working hours are clear (Hinkley, Crawford, Salmon, Okely, & Hesketh, 2008).

Occupational behaviour begins developing at an early age. The increasingly physical inactive lifestyles that are of current concern can be traced back to childhood (Wilcock, 2006). According to the WHO, education is of primary concern and they have called for action to be taken in order to improve the emotional, social, cognitive and physical development of children. As a result, researchers are paying closer attention to children's occupations and environments (Lawlor, 2003; Lynch, 2009).

Enabling and empowering people to improve their health and well-being can take many forms (Wilcock, 2006). A focus on what people do is central, e.g. how people interact with each other through what they choose to do, what they value and experience, what they may like to do in the future, and how they understand the potential relationship between what they do and their health status. This perspective is the core concept for occupation-focused health promotion and is in line with the WHO's "Health for all" objectives across the globe. Therefore, there is a need to develop and explore new research methods to enable a greater understanding of the relationship between occupation and health.

Childhood obesity

Childhood obesity has increased globally, it is a health problem (WHO, 2000) and is associated with a number of complications later in life (Dietz, 1998). In addition, it has been shown that obese children have reduced perceptions of their self-esteem and quality of life, compared to children of normal weight (Griffiths, Parsons, & Hill, 2010; Lin, Su, Wang, & Ma, 2012; Skär & Prellwitz, 2008). A number of interventions have been shown to be effective, and high quality evidence has recently emerged from several countries which suggests that the rise in the prevalence has slowed appreciably. However, the prevalence is still high and this remains a significant public health issue (Olds et al., 2011).

Prevalence studies have been carried out in numerous countries, and the results vary. In Sweden the prevalence of obesity is approximately three percent at four years of age (Mangrio, Lindström, & Rosvall, 2010) the same is true for children aged seven to nine (Sjöberg et al., 2011), furthermore, up to 17 percent of children aged four to nine years of age are overweight. In 2000 the International Obesity Task Force (IOTF) developed

BMI references, constructed on the basis of six nationally representative data sets in order to define childhood overweight and obesity (Cole, Bellizzi, Flegal, & Dietz, 2000). This is now widely used, although, a number of other references and cut-offs for assessing child obesity are available, e.g. the WHO standards, released in 2006. BMI for children is called isoBMI, according to the IOTF, and the values are calculated in the same way as for adults, however, the weight classification and limits for overweight and obesity differ according to gender and age from two to 18 years (Cole et al., 2000).

The medical consequences of childhood obesity are well documented and the risk of obesity persisting later in life increases the older a child gets (Freedman et al., 2005; Nader et al., 2006). It is suggested that obesity that begins during the period of adiposity rebound, which occurs between the ages of five and seven and during adolescence appears to increase the risk of persistent obesity (Dietz, 1998). Recent research shows that childhood obesity is associated with the way in which the family manages daily occupations in their home environment (Bellows et al., 2010; Kitzman-Ulrich et al., 2010) and that rapid weight gain during early childhood is a risk factor for adult obesity (Ekelund et al., 2006).

The shared family environment and the influence of parents on children's occupational patterns and meal routines should be considered when promoting a healthy family lifestyle. Environmental factors are implicated in the rapid increases in childhood overweight and studies have shown, for example, that mothers exert a strong influence over their child's weight and appear to be more concerned about eating behaviours than fathers are (Birch & Fischer, 2000; Campbell, Williams, Hampton, & Wake, 2006). However, in many households, both parents have an impact on the family's pattern of daily occupations, including lifestyle and children's eating habits (Berge, Wall, Neumark-Sztainer, Larson, & Story, 2010; Elfhag, Thynelius, & Rasmussen, 2010). One of the assumptions in this thesis is that changes in parents' patterns of daily occupations may have an impact on their children's repertoire of occupations and, in turn, on their weight.

This assumption is based on how children develop in relation to their family and home and is grounded in the occupation-focused approach, which proposes that supporting families to examine the way in which they engage in daily occupations as a family is a better way of identifying needs for change than mainly focusing on nutrition and physical activity (Ziviani, Desha, Poulsen, & Whiteford, 2010). None the less, participation in physical activities is still important as childhood obesity is largely influenced by shared genes passed from parents to the child (Perusse & Bouchard, 1999). Thus, healthy eating and physical activity may be more important for some families than for others. In this thesis, physical activity refers to bodily movements produced by skeletal muscles which result in significantly higher energy utilisation than when the child is resting (Bouchard et al., 1993).

Children's occupations

There has been a striking change in the lifestyles of many of today's children. Technological development and increased access to food, in combination with economic growth have had both a positive effect on children's health and a tendency to shift them towards unhealthy behaviour such as reduced physical activity and altered eating habits (Lakadawalla & Philipson, 2009). The social and economic structure of two working parents has become a norm rather than an exception in western society in the 21st century (OECD, 2013). As a result, many children today are cared for by people other than their parents (e.g. at home, in childcare centres, preschools etc.) which allow children to interact with other children and adults from diverse cultural backgrounds. Interactions in this socio-cultural context may constitute positive influences that shape children's development. Consequentially much has changed in children's favour during the last few decades, resulting in children having greater confidence and the autonomy to proclaim the right to make their own choices e.g. in play and nutrition.

Play has, however, become increasingly virtual for children from an early age, with little need to be physically active or negotiate and communicate with other players (Rodger & Ziviani, 2006). The internet and mobile phones have an impact on the way children learn and communicate with other children and adults; this kind of technological environment which is the reality for most children today, has decreased their need for mobility. The interactional nature of play between parents and their children has in many ways, also changed over the course of the last century in the western world (Hofferth, Kinney, & Dunn, 2009). Technology and the media have introduced new ways to play. This rapid change from physical to less physically active play has in fact been encouraged by many parents; while parents have also demanded that children's play spaces be made safer, e.g. playgrounds.

Most children grow up in a supportive environment, although children can also be deprived of the opportunity to participate in, for them, meaningful occupations. The home and the close neighbourhood are children's social and physical surroundings and, as such, they influence the things children choose to do. Children have long used spaces in their surrounding environment for play, such as the streets, backyards, parks, woods and even parking lots and other places not constructed for play. If they have the opportunity, most children will find spaces to play in all environments. Nevertheless, children's needs for activities requiring more space, such as cycling, ball games, and hide and seek are for the most part neither met nor recognised in the built environments of many cities around the world (Blakely, 1994). In addition recent research shows that children's free-time has declined and that children tend to be overscheduled with structured activities from an early age (Hofferth & Sandberg, 2001). Although, it is not the children who express dissatisfaction with this, it is mainly the parents' stress from spending their free time driving their children to and from different activities that results in potential stress for the whole family (Elkind, 2001). Since research has also shown the long-term benefits of children's organised activities as well (Mahoney, Larson, & Eccles, 2005) parents need to use various strategies to both involve their

children in family routines and involve themselves in their children's activities (Hofferth et al., 2009).

Through participation in play activities, children learn social skills and develop roles such as friend and group member. Obesity in childhood may, however, lead to low self-esteem and a lack of friends to play with (Skär & Prellwitz, 2008). Through doing with friends and family, children develop a sense of belonging; thus, a lack of participation in daily occupations can have a profoundly negative impact on children's development (Segal, Mandich, & Polatajko, 2002). Accordingly, viewing young children as occupational beings in their own right is an essential requirement for everyone who interacts with children.

The International Classification of Functioning, Disability and Health, Children and Youth version (ICF-CY) (WHO, 2007) has acknowledged the multidimensional nature of health. It is often used to frame the concept of children's occupations and societal participation. The ICF-CY framework provides detailed developmental aspects of functioning and focuses on learning and environmental factors with a child perspective in order to enhance the understanding of children's needs. Children may be exposed to an environment which contributes to the child developing a health condition that, in turn, will impact on their bodily function and hence activity and participation (Rodger & Ziviani, 2006). Occupational therapy's focus on engagement in occupations to support participation complements the WHO perspective articulated in the ICF (WHO, 2001). It is important to bear in mind that all children should be given the same opportunities to develop, and in accordance with to the UN Declaration of the Rights of the Child, adopted by the UN General Assembly in 1989, which states, for example, that all children have the right to grow up and to develop physically and spiritually in a healthy manner, free and with dignity and that all children have the right to special care and protection and to adequate nutrition, housing, recreation and medical services (UNICEF, 2012). Parents have the most important role in the child rearing and, fortunately, most parents are intuitively aware of their child's needs and will support them the best that they can. However, a recent study has shown that parents of obese children were unaware of their children's low self-rated quality of life (Lin et al., 2012). In order to understand parents' varying choices regarding time use and the subsequent effect on children's development in contemporary society it is essential to recognise that there is a great diversity of family types.

Family

In this thesis the term family is defined by the family itself, and the use of the term parent refers to the adult living with the child, most often the biological parent, but it may also refer to a stepparent. Both mothers and fathers are referred to as parents.

A family consists of a unit where all members in some way influence each other. The view of the family as a system is emphasised in familiar system theory concepts (Dunst

& Trivette, 2009). System theory involves the concept that all parts of a system are connected such that change in one part of the system influences other parts of the system (Nichols, Pace-Nichols, Becvar, & Napier, 2000). There are, however, many factors that enable us to understand the relationships between people, their surroundings and the occupations they choose to do. There is a dynamic relationship between children and their contexts; a child's true performance will occur in natural environments, and independence and change occur when wants and needs are satisfied. Thus, the development of children's occupations cannot be understood without insight into what shapes daily occupations in the family context.

Family formation in developed countries has changed in many ways, for example, delayed parenthood has increased the age of parents. Women's and men's participation in further education and their establishment in careers, in order to reach economic independence prior to having children, appears to affect family lifestyles. The challenge of combining full time work and parenting is a reality for both dual parent families and single parent families. Furthermore, children's lives today seem to be busier and more regulated than in previous generations. Regardless of whether both parents are in full-time employment or unemployed, family constraints and opportunities contribute to family identity and different family patterns (Rodger & Ziviani, 2006). Parental risk factors such as a low educational level and low socio-economic status, as well as the family having a single parent have been associated with childhood obesity (Magnusson, Sjöberg, Kjellgren, & Lissner, 2011). Recently, there have been studies which have shown that overweight or obese parents, maternal smoking during pregnancy (Mangrio et al., 2010), and parents with a heavy work load (Golan & Crow, 2004) predict childhood obesity, although, inadequate physical activity in the family is believed to account for much of the obesity problem (Lipnowski & LeBlanc, 2012).

Social coordination and co-occupation in families

Parents and children often spend time doing things together every day, but finding this time requires a social coordination in time and space. This temporal coordination of daily occupations appears to be an important element not only in family life, but also among co-workers and friends, and in the community as a whole. Social coordination of occupations is regarded by Larson and Zemke (2003) as complex requiring consideration of individuals' routines, competing desires and needs in their daily life. The home is a setting where social coordination of daily occupations is considered as essential in order to meet family members' physical and emotional needs, and family members may both share time together and compete with the time available (Larson & Zemke, 2003). For example, family members are nested, others schedules must be taken into account and several competing time requirements must be synchronised each day. Furthermore, occupations are often shared, and those that implicitly involve two or more individuals are termed co-occupations (Zemke & Clark, 1996). Co-occupation has been described by Pierce (2009) as a dance between two individuals that sequentially shapes the oc-

cupations of both persons (Pierce, 2009). Children's learning occurs in their interactions with people and their environment, and from early on, young children show motivation to engage in occupations by imitating adults (Davis & Polatajko, 2010). Thus, it seems important to develop an understanding of how the social coordination of occupations is achieved and how co-occupations are structured in family life between parents, as well as between parents and children.

According to Matuska and Christiansen (2008), a balanced lifestyle is defined as a satisfying pattern of daily occupations that is healthy, meaningful and sustainable for individuals within the context of their current life circumstances. However, evidence of parents' perceived lack of balance in their everyday lives is found to be widespread. For example, there are studies indicating that women's and especially working mothers', specific situation, in terms of both paid and unpaid work, is stressful (Erlandsson & Eklund, 2006). In the U.S. nearly three quarters of working mothers and fathers feel that they do not spend enough time with their children (Bond, Galinsky, & Swanberg, 1998). Recent research on lifestyle balance also includes social roles (such as worker, spouse, parent, etc.) because roles involve occupations that bring obligations and demands as well as pleasure. Roles can be congruent, but can also conflict with each other (Christiansen & Matuska, 2006). Another variation of role balance is termed work-family balance (Kofodimos, 1990), defined by Clark (2001) as a satisfactory and well-functioning daily life with a minimum of role conflict, both at work and at home. For example, work that falls outside of the regular routines of family life requires adaptive strategies and planning from both parents in order to fulfill their roles as both workers and parents. Research has shown that increased working hours or unusual work schedules often leads to conflicts which are related to the time spent away from the family (Gallew & Mu, 2004; Greenhaus, Collins, & Shaw, 2002). Thompson and Bunderson (2001) found that workers who spend more time on family roles experience a higher quality of life than those who spend more time on work roles. Even if the studies on work-family balance, referred to previously have contributed important information regarding the quality of life among parents, they have not provided insights into an understanding of parents co-occupations when interacting with their children or parents' shared patterns of daily occupations in family life. Therefore, there is also a need for studies of parents' patterns of daily occupations in order to learn more about how enabling strategies for change may be implemented in everyday life.

Time use

What is time? Defined by Lynch (1972) "time is a mental device to give order to events by identifying them as co-existing or successive" (p.120); while Meyer (1922) described time thus, "time reveals itself as a vacuum, inviting us to fill it with doing". Time is the only resource that each and every day is evenly spread among all individuals in all populations (Ellegård, 1999). Human beings have internal circadian rhythms that

regulate the sleep-wake cycle, which lead us to be active during the day and to rest at night (Sarkis, 2000). Night-shift work and other reasons for being awake at night disrupt the balance between the light-darkness cycle and this has been shown to affect overall health and wellbeing (Gallew & Mu, 2004; Harrington, 2001). What we do parallels what time it is, and most people know what they should be doing by the measure of time; however, time perspectives may vary in e.g. different cultures. Terms, such as mealtime, playtime, daytime, full-time and part-time, illustrate how the patterns of time and doing are intertwined. Time is a resource that families spend in order to engage in daily routines, however, families use their time resources in different ways. That there are ways to use the time available that are more or less healthy has attracted global interest, and scientists have discussed how the increased pace of life in developed countries has had negative health consequences (Clark, 1997).

Time use research

Time use research has been conducted in many countries among different populations and is used in a variety of disciplines in order to increase the understanding of human behaviour (Harvey & Pentland, 2010; Pentland, Harvey, Lawton, & McColl, 1999). Time use data have been collected on a regular basis in many western countries since the beginning of the 20th century. In many countries central statistical agencies conduct recurring time-use studies of their population. Many researchers are interested in comparing time use between different groups, e.g. time spent in childcare divided between men and women (ATUS, 2012; Craig, 2006; Statistics Sweden, 2010). There is also an interest in using time use data as a measure of quality of life, for example, looking at leisure time, as well as time spent with friends and family, as indicators of well-being (Phipps & Vernon, 2009). The validity and reliability of time use diaries are, however, directly affected by subject's motivation, belief in the importance of the data and sense of involvement in the study (Grimler & Roy, 1987).

Time-use studies give a window on actual lifestyles. This can include information about a person's underlying activity preferences, dispositions and priorities. From these normative measures we can begin to see what types of healthy and unhealthy behaviours occur and where they occur, this in turn, suggests which interventions and strategies may be necessary. The relationships between time use and children's health and well-being are receiving increased attention in the literature (Hofferth et al., 2009). Less attention has, so far, been paid to the relationships within families, comparing time use with preschool children divided between women and men and its impact on children's development. To do so there is a need for a methodology that incorporates the temporal character of occupations that includes a relationship to one's sense of past, present and future.

A number of time-use methodologies have been developed for collecting time use data. One of the most comprehensive is the Multinational Time use Study which uses a time-budget approach (Szalai, 1972) according to the Stylized Method (SM) in which

the typical amount of time spent on certain activities is documented, and the Experience Sampling Method (ESM) which involves an electronic pager signaling when it is time for the respondent to document which activity is being performed at the moment and how the event is experienced (Csikszentmihalyi & Larson, 1987; Zuzanek & Mannell, 1993). These two methods investigate episodes which are taken out of their context and do not provide a way of understanding of patterns of daily occupations; however, the strength of the ESM is that it provides relevant information on how occupations are experienced. A third method is the Time Diary Method (TDM) which tracks all activities during a 24-hour period through a diary which is in some cases, complemented with an additional interview (Juster, Ono, & Stafford, 2003) or as in the large American Time Use Survey (ATUS), a 24-hour recall diary, complemented with a telephone interview (Phipps & Vernon, 2009).

Time us is measured within occupational therapy, and TDM is the time use method most commonly used in paediatric occupational therapy (Larson & Verma, 1999; Lynch, 2009; Ziviani, Lim, Jendra-Smith, & Nolan, 2008). In order to understand the determinants of well-being for people with schizophrenia, Bejerholm, Hansson and Eklund (2006) developed the instrument Profile of Occupational Engagement in people with Schizophrenia (POES). The POES is based on a 24-hour self-reported time-use diary, in which is recorded the occupations performed, geographical and social environment, complemented with the diarist's reflections on and perceptions of the experiences involved in the performance of those occupations. The time-use diary is, in turn, supplemented by an interview in order to ensure that the diary is completed and to increase the validity of the data. Despite this, none of the methods mentioned above, were considered suitable in order to learn about parents' shared patterns of daily occupations, i.e. the time each parent spends on different occupations, distributed between the parents in time and space.

Time-geographical approach

Time-geography is used as an approach with the direct purpose of deriving knowledge from how different groups in the society use their time and space. New dimensions are added to traditional time-use studies. Ellegård (1999) presents a time-geographical method which was developed in order to elucidate the web of everyday life, as revealed in people's diaries. Lenntorp stated, according to Ellegård and de Pater (1999), that time-geography should be seen as a foundation for theory building rather than as a theory in itself. It helps us to illuminate the temporal patterns of people's occupations and their relationship to health and illness and its fundamental concept is ecologically oriented, underscoring the fact that all individuals, no matter who they are or where they come from share the earth, water, and air (Hägerstrand, 2009).

Time-geography methodology incorporates a time use component, but also includes the dimensions of physical place and social networks embedded in everyday life. This methodology emerged from studies of population movements in Sweden that were

conducted by Hägerstrand (Ellegård & Svedin, 2012). Originally it was developed to support different aspects of community planning.

A time-geographical approach, employing a diary method in order to investigate the time used in activities in families' everyday life has proved to be useful (Ellegård, 1999; Ellegård & Nordell, 1997). In recent years, time-geography has been applied within occupational therapy and occupational science research e.g. to examine the relationship between time, place and social networks in everyday school activities (Kellegrew & Kroksmark, 1999); to describe the everyday life of adolescents with poor vision (Kroksmark & Nordell, 2001) to describe working mothers' patterns of daily occupations (Erlandsson & Eklund, 2001; Erlandsson, Rögnvaldsson, & Eklund, 2004), to investigate time use and activity patterns in women with long-term pain (Liedberg, Hesselstrand, & Henriksson, 2004) and to gather information about university students' everyday occupational patterns (Alsaker et al., 2006).

The time-geographical approach focuses on individuals, but it can also be used on a population. The individual diary writer keeps an open diary, written in a small booklet with headlines on each page. Diaries are coded and can be visualised by transforming the diaries into graphs and then analysed on an individual level or by household. Two kinds of computer software have, so far, been developed with the aim of presenting a visual overview (graph) of individuals' time use and to illuminating real time use i.e. the time used for activities as they appear in a continuous sequence, and to analyse added time use i.e. the total sum of time used for different activities (Ellegård & Cooper, 2004; Ellegård & Nordell, 2008).

Through self-observations, diary-writers continuously document activities performed in their daily lives, they ways in which they are involved in social relationships, what transport they use and their geographical location (Ellegård, 1999). The time-geographical approach may serve as a basis for studying the complex variety of activities in everyday life. In the time-geographical approach, the first step is to determine how the activities occur and can be comprehended in the context of the individual. Hägerstrand (2009) hereby also recognised that there are intentions and ideas behind humans movements in time-space, projects are performed in different environments and some projects claim couplings (between individuals in the same place, on the move or on the internet).

An area designed for one or more recurring projects is called *a pocket of local order,* in which the order is agreed upon and upheld by the individuals involved in *the project*, i.e. the family (Ellegård & Svedin, 2012). When different activities are related to each other (on an individual level or together with other family members, friends, colleagues etc.) by having the same goal, they constitute a project. The interaction between individuals and the environment is essential to time-geography. Individual's movements in the time-space are tracked and visualised through a trajectory called *the individual path*. These three concepts, here mentioned can be regarded as the most important for this thesis, together with the understanding of the *window of opportunity for change,* in which the point in time called now is present. This is possible to catch since the continuous sequence of activities performed by an individual over the course of a day is

visualised by the individual path (see Figure 1) based on the principle of real time use (Ellegård & Cooper, 2004).

Time-geography incorporates an alternative method by which to study the range of opportunities people have that enable them to realise relevant situations for change, both now and in the future. All individuals are obliged to undertake physiologically necessary activities such as eating, sleeping and taking care of personal hygiene, and in addition to this, there are *authority, coupling* and *capacity constraints* (Hägerstrand, 1970). *Authority constraints* concerns, for example, employment agreements that regulate working hours, the availability of daycare, or the grocery store's opening hours and these, in turn, determine the amount of time the individual has left travel to and from places and spend time with their family. *Coupling constraints* refers to how people are required to couple themselves together with others to accomplish daily and future projects, and *capacity constraints* concern the individual's skills, knowledge, economic and material assets. These constraints are of critical importance to the study of everyday life in families.

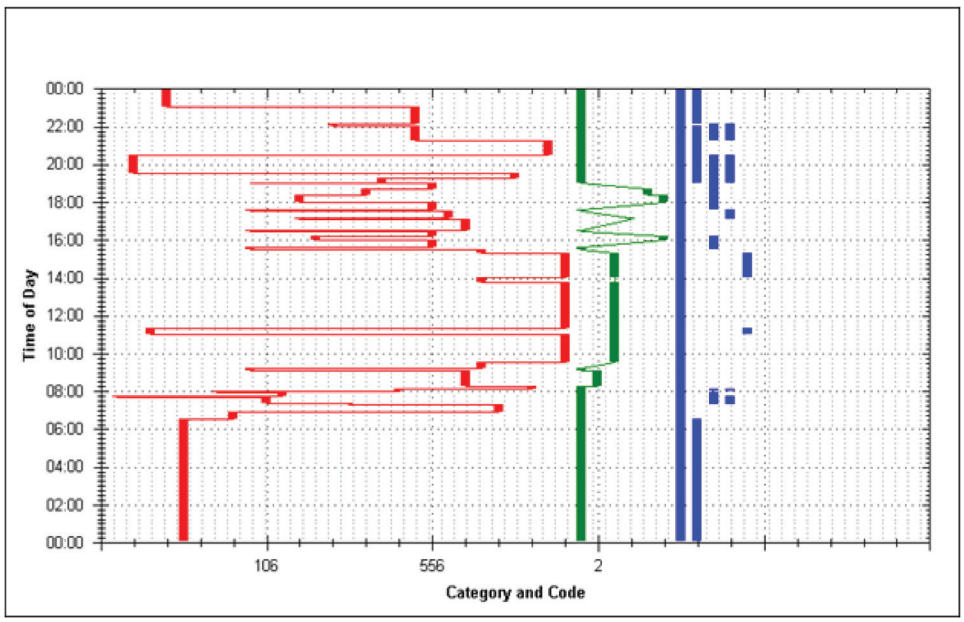

Figure 1. Example of a graph visualising a persons' time use over a 24 hour period. Time spent on various occupations is shown on the red trajectory to the left. The vertical sections of the red trajectory show the time use and the horizontal sections indicate that the diarist stops one activity and starts another. There are seven activity spheres on the x-axis, from the left: care for oneself, care for others, household care, recreation, procure and prepare food, work and schoolwork. Location (e.g. home, work, going somewhere by walking, cycling or car) is shown on the green trajectory and social companionship on the blue trajectory (the diarist, partner, children, co-workers, friends etc.).

Experiences in patterns of daily occupations

Based on the theoretical framework of the Value and Meaning in Occupation Model (ValMO) (Persson, Erlandsson, Eklund, & Iwarsson, 2001) it can be assumed that experiences in an individual's everyday life are shaped by their previous life experience, as well as their conception of the future. The model emphasises that occupations can be viewed either 'here and now' (the micro or the meso perspective) or through a persons' whole life situation (the macro perspective). The meso perspective refers to occupations performed over days, weeks and months. This perspective is in this thesis referred to as patterns of daily occupations. The ValMO model describes different aspects of value that may be attached to occupations. The value and motivational dimensions of concrete, symbolic, and self-reward values are used to describe the way in which what we choose to do in everyday life is influenced by who we are and how those opportunities are available in the environment determine the value we assign to certain experiences (Persson et al., 2001). Experiences such as boredom or a lack of enough physically or mentally stimulating experiences may affect perceived occupational value (Martin, 2009). Argentzell, Leufstadius and Eklund (2012) showed, in a group of people with psychiatric disabilities, that strong predictors for a high level of perceived occupational value were having less depression, having a high level of activity and a high level of self-mastery. People may also be restricted in their opportunities by factors, such as, a lack of time and resources or a lack of awareness of the importance of balanced engagement in daily occupations, which may affect their perceived occupational value. Thus, it seems to be appropriate to view occupational value as an indirect assessment of experienced occupational meaning in daily life.

Family intervention

For a child, the most immediate environment consists of the home, and their pattern of time use is woven closely with that of their parents' and siblings'. Thus, in attempts to change a child's pattern of occupations in order to improve their health, the support of and collaboration with parents is vital (Ziviani, Desha, & Rodger, 2006). Over the past 25 years, the family-systems model has been developed and proven to be useful in family interventions (Dunst & Trivette, 2009; Trivette, Dunst, & Hamby, 2010). The model is implemented by practitioners who use capacity-building help-giving practice to influence family members in identifying their needs and resources, to enable them to meet those needs and to use their existing capabilities (strengths) to develop new abilities which aid them in reaching their goals.

The fundamental hypotheses in family-system intervention are based on Bronfenbrenner's (1979) contention that, unless parents are provided the necessary supports and resources to allow them to have time and energy to carry out their parenting responsibilities, they may experience difficulties to interacting and promoting

the development of their child. Bronfenbrenner (1979) emphasised *"Whether parents can perform effectively in their child-rearing roles within the family depends on the role demands, stresses and support emanating from other settings… Parents' evaluation of their own capacity to function, as well as their view of their child, are related to such external factors as flexibility of job schedules, adequacy of child care arrangements…"* (p.7).

Findings from the rigorous research led by Dunst shows that parents' perception of self-efficacy and well-being directly affect parent-child interactions and in turn child development (Swansson, Raab, & Dunst, 2011). The authors conclude that family-systems intervention helps to put in place the resources and supports that can ensure parents have time and energy to interact with their children in ways that provide opportunities for learning and family well-being (Trivette et al., 2010).

We can learn from this research to understand how intervention programmes should be designed in order to prevent the development of obesity in young children. Solution-focused family therapy has also been proven to be useful in treating obese school-age children (Nowicka, Pietrobelli, & Flodmark, 2007). Changes in occupational performance areas in everyday life, where a balance between sedentary and physical activities is occurring can be one way to prevent obesity in early childhood (Cavill, Biddle, & Sallis, 2001; Poulsen & Ziviani, 2004). A better understanding of parents' priorities and challenges in everyday life and their patterns of daily occupations is probably an additional factor with which to build on the existing knowledge about how such interventions and preventive programmes should be designed. Systems theory has been found to be useful as a theoretical framework to describe changes (Bornman & Granlund, 2007). Dunst and Trivette (2009) described in their research how a capacity-building family-systems intervention can enable experiences and create opportunities to both strengthen existing and develop new parenting and family abilities. There are many ways to characterise the important factors that enable us to understand the relationships within families, their environment and the occupations they choose to do. Therefore, it should be possible to combine family systems theory and a more ecocultural understanding of children's and families' daily routines within the scientific discipline of occupational science, which is founded upon the premise that participation in meaningful occupations influences one's health (Wilcock, 2006).

Occupation-focused practice

Working with parents with the aim of placing the focus on parents as enablers in implementing change is described in this thesis. Occupational-focused interventions are effectively designed for specific goals, anchored in everyday experience and reflect the requirements for choosing and implementing change in the lived environment, as indicated by the parents. The Model of Human Occupation (MOHO) was the first model proposed to guide occupation-focused practice (Kielhofner & Burke, 1980) and there is a weight of evidence for its usefulness (Lee, 2010). It is assumed that a natural, bal-

anced pattern of daily occupations is believed to be health enhancing and fulfills both the needs of the individual and the demands of the environment (Kielhofner, 2008; Meyer, 1922).

Clark and colleagues (Clark et al., 1997; Clark et al., 2012) directly applied occupation science research to clinical practice, creating the Lifestyle Redesign program. The core theme of the studies they conducted was health through occupation. A large randomised controlled trial, the Well-Elderly Study, showed that the occupational-focused intervention reduced the health risks and increased the quality of life of older adults (Clark et al., 1997). Pierce (2003) described a process for occupation-based interventions as using occupation as both the means and the outcome of an intervention and called the approach "Occupation by Design: Building therapeutic power" which describes how occupation is used in practice. There is a need to emphasise occupations as an essential element in health promotion, education and practical training regarding, for example, eating habits and activity levels should be used to promote a healthy lifestyle for individuals and their families (AOTA, 2008). Therefore, it seems relevant to clarify current knowledge and explore how patterns of daily occupations are shaped in families, how opportunities for participation in physically active occupations differ and how to determine if it is possible to encourage individuals to participate in health enhancing occupations.

Aims of the thesis

The overall aim of this thesis was to explore shared patterns of daily occupations among parents of preschool children with obesity, and to investigate if it was possible for parents to change the amount of time they spent together with their children and their perceived occupational value. Factors related to any change in parents' time use as well as any change in children's BMI z-score were also investigated.

The specific aims were:

- To investigate the usefulness of a time-geographical diary method combined with stimulated-recall interviews, in facilitating reflections on how patterns of daily occupations change over time, and in determining the reasons behind these changes (Paper I).
- To identify the characteristics of shared patterns of daily occupations in the families of children diagnosed with obesity, based on how parents temporally coordinate their daily projects (Paper II).
- To investigate if and to what extent mothers' and fathers' time use varies in families with differing patterns of daily occupations (Paper II).
- To explore any changes in the amount of time parents spent together with their children, with reference to: (a) preparing and having meals, (b) physically active occupations, and (c) physically inactive occupations (Paper III and IV).
- To explore whether time use in areas of occupation (a-c) varied between groups of four different family types and between mothers and fathers (Paper III and IV).
- To explore any changes in parents' perception of occupational value (Paper III and IV).
- To identify if children's BMI z-score changed over the course of a one-year intervention and whether any changes in BMI varied according to family type (Paper III and IV).
- To explore factors related to any changes in parents' time use as well as any change in children's BMI z-score over the course of a one-year intervention (Paper IV).

Materials and Methods

Design

This thesis is based on two studies evaluated in four papers, and consists of three types of research design: qualitative, mixed methods and quantitative. The selection of research designs was dependent on the nature of the issue being addressed and the aims of each of the four papers. The main issue was, however, to explore shared patterns of daily occupations among parents, and in order to do so alternative strategies of inquiry were used.

The first study had a qualitative approach. A time-geographical diary method was used in order to encourage individuals to reflect on their everyday lives. The usefulness of using the time-geographical diary method, including illustrative graphs in combination with an interview, was tested (Paper I).

The second study had a quasi-experimental design and resulted in three papers. Paper II had a mixed methods research design, in order to detect the characteristics of parents' shared patterns of daily occupations. A sequential exploratory strategy was used (Creswell, 2009), implying simultaneous collection of data for both qualitative and quantitative analyses. Quantitative explorative longitudinal strategies were used in Paper III and IV, involving a series of time-use diaries and children's BMI z-score, collected over the course of a one-year intervention, in order to detect changes in the amount of time parents spent together with their children and children's subsequent changes in BMI, respectively. Factors related to any changes in parents' time use and children's BMI were also explored (Paper IV).

Overview of the studies

This thesis was composed of two studies: Study 1 (Paper I) and Study 2 (Papers II-IV). The methods used are summarised in Table 1.

Table 1. Overview of study designs and methodologies used in the thesis.

Paper	I	II	III	IV
Research design	Qualitative	Mixed Methods	Quantitative	Quantitative
Sample selection	Convenience	Purposive	Purposive	Purposive
Participants	2 women	30 parents (15 couples)	30 parents of 17 children	40 parents of 22 children
Inclusion criteria	Women aged 30-50 years, in a two-parent family, a child aged 2-6 years, working more than half time	Parents randomised to the LiLi intervention, both parents primary care givers, living with their child	Parents randomised to and completed the LiLi intervention and provided time-use data	Parents randomised to and completed the LiLi intervention and provided time-use data
Data	Time-geographical diaries with a supplementary stimulated-recall interview	Time-geographical diaries Socio-demographic questionnaire BMI parents	Time-geographical diaries Socio-demographic questionnaire Occupational Value (OVal-pd) BMI parents and child	Time-geographical diaries Socio-demographic questionnaire Occupational Value (OVal-pd) Mastery-S, Subjected health and satisfaction with everyday activities BMI parents and child
Analysis	Content analysis[a]	Sequential exploratory design[b] Content analysis[c] Descriptive statistics ANOVA Post-hoc tests	Linear regression analysis Kruskal-Wallis test Mann-Whitney U-test Wilcoxon signed-rank test Cronbach's alpha ANOVA	Linear regression analysis t-test Pearson correlations ANOVA Pearson Chi-Square tests Multiple regression analyses

Note: Accordance with a Burnard (1991), b Creswell (2009) and c Graneheim & Lundman (2004)

Study context

The first study involved two women who were selected through convenience sampling in order to capture highly complex patterns of daily occupations.

The study context for Papers II-IV was parents enrolled in a randomised controlled trial (RCT) involving families with preschool children who had been identified by the Child Health Care services (CHC) as obese. The overall aim of the Lund Overweight and Obesity Preschool Study (LOOPS) was to evaluate if a one year family-based intervention, targeted four to six year old preschool children considered overweight or obese had a positive long-term effect on the weight development of the targeted children (Önnerfält et al., 2012).

The recruitment process for LOOPS extended from the autumn of 2008 to spring 2012; the study sample was 80 children who had been diagnosed with obesity and 160 children who were considered overweight. The number of children was based on power calculations, suggesting that the group sizes would be sufficient to detect a moderate effect size with 80% power with a two-sided significance level $p < .05$.

The primary outcome variable in the LOOPS study was the change in BMI z-score of the children. The BMI z-score was calculated from measurements taken at referral date, at inclusion, after six months and at the end of the intervention. Follow up will be performed at one, two and four years following the end of intervention (Önnerfält et al., 2012). The selection criteria for the RCT were: children four to six years of age, diagnosed as obese or being overweight and having parents who were interested in participating in the study. An additional criterion used for inclusion was that written and spoken Swedish must be sufficiently understood to allow participation in group sessions. Children diagnosed as obese were randomly assigned to one of the two parent-only interventions; one occupation-focused family intervention and one behavioural-focused family intervention, both combined with the option to access a website exclusively developed for parents of children in the intervention (see Figure 2, page 42). The overarching goal was to enable a lifestyle change in the families which had the potential to have positive long-term effects on the normalisation of the child's body mass index and health. The clinical trial was registered at ClinicalTrials.gov (NCT00916318), a publicly accessible database.

Papers II-IV in this thesis had a quasi-experimental design and only involved parents who were enrolled in the occupation-focused family intervention. The aim was not to compare the results with those of other interventions or to evaluate the effect of LOOPS. However, in line with the Medical Research Council framework for development and evaluations of RCTs for complex interventions to improve health (Craig et al., 2008), a theoretical understanding is needed of how the intervention causes change or the reasons why it fails, with the intention that weak links can be identified and strengthened. Thus, the framework for this thesis has an exploratory nature, while describing both the constant and variable components of an occupation-focused family intervention with feasible protocols (manual directed) so that it will be possible in the

future to compare the intervention to appropriate alternatives. The RCT (LOOPS) will be evaluated in future studies.

The intervention programme

Theoretical origin

An occupation-focused intervention programme was developed for parents who have children who are four to six years of age and have been diagnosed with obesity. The programme Lighter Living (LiLi) is based on the Redesigning Daily Occupations (ReDO) programme (Erlandsson, in press) developed for and evaluated on women with stress-related ill health (Eklund & Erlandsson, 2011). These programmes were in turn, inspired by "The Lifestyle Redesign program" developed as a community programme of health promotion for elderly (Mandel, Jackson, Zemke, Nelson, & Clark, 1999). Clark and associates (Clark et al., 1997) have demonstrated empirically that lifestyle redesign through meaningful occupations can maintain and enhance health and well-being. The intervention programme Lighter Living is specifically based on knowledge from research done by Erlandsson and Eklund (Erlandsson & Eklund, 2001, 2003, 2004, 2006) and Erlandsson (2008) and also the theoretical assumptions in the Value and Meaning in Occupations (ValMO) model (Persson et al., 2001).

This structured LiLi programme provides participants with education, strategies and tools for development and meaningful goal setting in order to re-design or build habits and routines which include engagement in health promoting activities. The parents are guided by the therapists and are encouraged to do self-analyses of their patterns of daily occupations in order to reflect and identify needs for change in their daily occupations that will support a healthier lifestyle.

The development process of the LiLi programme involved the adaptation of the ReDO programme, to make it suitable for parents of preschool children with obesity. Therefore, the theoretical structure is also based on current theories of family development (Nichols et al., 2000) a view of the family as a social system and current guidelines of successful strategies for empowering the parents of children with obesity to implement a healthier lifestyle in their family (AOTA, 2008). Each LiLi session's plan and contents were outlined in a manual, which were then applied in the intervention.

Structure

The LiLi programme came to consist of four phases, with 13 two-hour evening sessions over the course of one year. The aim was to enable the parents to use their strengths and give them the knowledge they specifically needed in order to change their patterns of daily occupations. The programme was designed as a course, including short seminars

based on knowledge about human occupations and the complexity of parents' patterns of daily occupations. The participants received course material, a specially designed folder, which included information specific to each session, general information about how to write time-use diaries and suggestions of play activities which could be easily replicated at home. Each group (seven in total) consisted of both the mothers and fathers of four to five children. The sessions were conducted by two occupational therapists, experienced in family interventions and group dynamics (of whom the author of this thesis was one). Phase 1, revolved around parents' occupational self-analysis; Phase 2, focused on setting goals for the family and developing strategies for change; Phase 3, covered implementing the strategies in daily life; in Phase 4, plans for the future were discussed and goals were revised. The group met every other week for ten weeks (Phase 1) followed by ten weeks continuation on their own. Phase 2 lasted for eight weeks, followed by a ten week break in the sessions. Phases 3 and 4 involved two sessions with ten weeks between them. The final session (13) involved an enjoyable gathering, which the participants planned themselves (see Figure 3, Page 48).

Content

Occupational self-analysis

All parents were encouraged to write time-geographical diaries as a tool for enabling them to reflect upon daily routines and patterns of daily occupations in the family. The first diary was written on a weekday between the first and second session in Phase 1, and the last diary was written between Phase 3 and Phase 4 (see Figure 3, page 48). During the sessions, all parents had the opportunity to analyse their current repertoires of occupations and compare these to their occupations in previous stages of their lives, in childhood and in adolescence. Some occupations that were important and highly valuable to the participants might have been lost at certain stages of their lives. The participants were encouraged to discuss how family routines and rituals contribute to the family's identity. This was an attempt to enable parents to reflect on and address those occupations which are for them meaningful, which in turn promotes health and well-being in the family, based on previous research (Clark et al., 1997; Clark et al., 2012). It was considered important not to undermine parents' own potential and ideas because the families were, perhaps, already burdened with a feeling that they had a lack of time for other activities e.g. leisure. Children's opportunities to learn from playful participation in co-occupations with their parents were discussed.

Reflecting and goal setting

Each group meeting followed a similar pattern, in terms of the timetable and structure; each session started with reflections on what had been learned from the previous session and any homework that had been done since the last session (e.g. play a game or visit at new playground together with their child). Seminars about setting goals and how to

develop strategies for fulfilling these goals were discussed both in group sessions and in pairs (mother and father). The parents were further encouraged to share their goals with family members and if they wished with, for example, preschool teachers in order to get help in implementing the strategies. The specific goal setting method used in the LiLi programme was the Goal Attainment Scaling (GAS) (Kiresuk & Sherman, 1968; Turner-Stokes, 2009) which was used to appraise changes in children's occupational performance goals, as rated by the parents. Statements reflecting five steps of improvements in occupational performance were determined by the parents at the beginning of the intervention. The five step scale starts with -2, indicating the current situation and continues to +2, indicating "the best we could hope for during this period". The scale ranges from -2,-1, 0, +1 to +2. At the end of the LiLi programme, the parents estimated the extent to which the goals had been attained by identifying one of the five steps in the GAS scale. Examples of goals set by the parents were: ride the bike to preschool together with the child, time for play with the children, arrange healthy evening meals, and decrease the amount of sweets the children are allowed on weekdays.

Targeting hassles and uplifts

The concept of daily hassles and uplifts (Erlandsson & Eklund, 2003, 2004) was introduced early in the intervention. The instrument Targeting Hassles and Uplifts (THU-5) (Erlandsson & Eklund, 2003) was used to detect the parents' experiences of hassles and uplifts in their patterns of daily occupations. The participants' listed their hassles and then selected the five most annoying, and arranged them from 1="not at all" to 5="the worst possible". The same procedure was employed for uplifting and stimulating experiences in the participants' everyday life (1="not at all" and 5="the best possible"). Descriptions of how high levels of hassles have a negative impact on well-being, and discussions of how up-lifting experiences may affect subjective health were explored, both individually and in the group, by categorising and discussing them. This is one example of an exercise which took place during the group sessions.

Occupational value

Several sessions involved creative and playful occupations performed together in the group. A self-assessment of occupational value (OVal-9) was used as a tool to stimulate the participants to become aware of and evaluate a specific perceived occupational value (Erlandsson, Eklund, & Persson, 2011). The different values occupations generate and the importance of including a variety of occupational value experience in everyday life were discussed.

Additional optional support in LOOPS

Website "Healthy children"

All parents enrolled in LOOPS were given access to a website. The website was locally adapted and was created especially for parents of children in the intervention programme. It was accessible only to them, using a unique username and password. It covered, for example, information about childhood obesity, healthy foods, recommendations on portion size and recipes, and suggestions for outdoor activities to increase physical activity. During the LiLi intervention, parents were encouraged to use the website to, for example, be influenced to try new recipes or find a new playground in the neighbourhood or ask the research team questions anonymously. Some of the recipes (those that were easy enough to later involve children in the cooking) were prepared in the LiLi group sessions as a practical and inspiring event, in order to support parents in trying new strategies to improve their meal routines.

Procedure

Parents' of children with obesity referred to LOOPS were randomly assigned to the intervention (Papers II-IV). The randomisation was stratified to ensure that those children who had at least one parent with obesity were randomised separately from children with both parents who were either of normal weight or overweight. This was done in blocked series of ten to ensure the divisions between the groups were equal. The allocation series was concealed in numbered envelops (Önnerfält et al., 2012).

Short after the randomisation the parents were invited to a lecture which had the purpose of giving all parents the same basic information about overweight and obesity in children. The lecture lasted 105 minutes and was given in the evening to ensure that both parents could attend. Several health professionals gave short presentations during the lecture, e.g. an occupational therapist presented aspects of the everyday life and daily occupations of families. Parents were, at this time, given the opportunity to reflect on the stress in dual working families with children that may result in low levels of physical activity and less time for cooking and mealtimes. Discussions about how routines and habits develop, and how these can be changed by time saving strategies were conducted.

All anthropometry measurements were taken using standardised methods by two registered paediatric nurses. The group leaders of the LiLi intervention had no knowledge or access to either the parents' or the children's BMI data. This was strictly a parent-only intervention; the group leaders did not interact with the children.

Participants

The inclusion criteria for Paper I were women, aged 30–50 years, living in two-parent families, working at least 75% of full-time hours and having at least one child aged two to six years. These criteria were set in order to capture the highly complex patterns of daily occupations described by Erlandsson and Eklund (2006). A convenience sampling method was used (Creswell, 2007). Through colleagues and friends, women who matched the criteria and who had no relationship to any of the authors were asked to participate in the study. The first two women who agreed to participate were chosen. For the sake of confidentiality, the participants were called Mary and Nancy. Mary was 35 years old, had a university degree, worked 40 hours a week, was married and had two children, aged two and five years. Nancy was 47 years old, had a university degree, worked 30 hours a week, was married and had four children, six, nine, 20 and 23 years of age.

A flowchart of the participants in Papers II-IV is shown in Figure 2. The studies took place in the city of Lund in southern Sweden. The Children's Hospital has a local catchment area with a population of 71,684 children and adolescents from birth to 17 years of age (Statistics Sweden, 2012). The participants were referred by their local CHC services to the Children's Hospital (Papers II-IV).

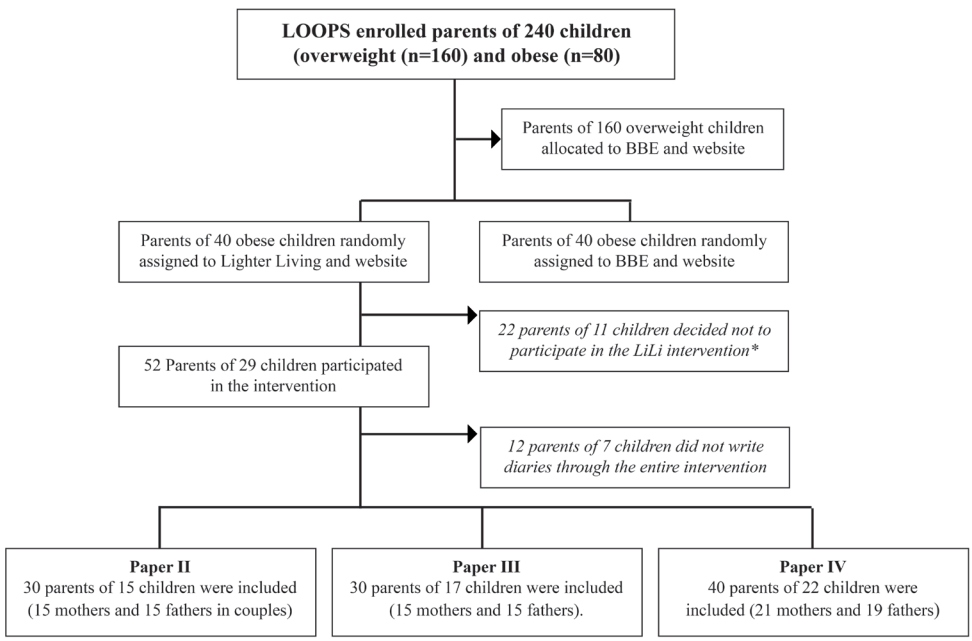

Figure 2: Flow chart of the participants (Papers II-IV)
LOOPS= Lund Overweight and Obesity Preschool Study
BBE= Better Balance Everyday (the behavioural-focused family intervention)
* Reasons given for not participating: Time constraints, no childcare in the evening, single parent, difficult to travel, parents' ill health and did not respond to invitation.

In Papers II-IV the sample was derived from parents randomised to and enrolled in the LiLi intervention. The children were identified at a regular visit to their local CHC. Parents were invited to a consultation with a paediatrician (specially assigned to the project), prior to their participation in the study, who gave oral and written information about the parent-only intervention, its procedures and about confidentiality. Once consent was obtained, the participants were randomly assigned and then invited to participate in the occupation-focused family intervention, from which data for Papers II-IV were collected.

In Paper II, a criterion-based, purposive sampling strategy (Creswell, 2007) was applied to parents of children with obesity (n=33 children), who had been randomised to the LiLi intervention. The parents selected for this study were from those families where both parents were primary care-givers and lived with their child/children. A diversity of family types, including dual parents and separated parents living in blended families, were acceptable. All couples where both parents had both written time-use diaries at the time of the analyses and fulfilled the inclusion criteria were included. Finally, a total of thirty parents (n=30) of fifteen children (n=15) were included.

In Paper III, a criterion-based, purposive sampling strategy was applied, which meant that the criteria were set to include all the parents who were the primary care-givers (lived with their child/children), had completed the LiLi intervention and had provided the required data at the time of the analysis. A total of thirty (n=30) parents of seventeen (n=17) children (11 girls and six boys) with no known diagnoses, besides obesity, participated.

In Paper IV the same type of purposive sampling strategy was used as in Paper III, as we could only study parents who had completed the LiLi intervention and had provided their time-use diaries. Consequently, in Paper IV at the time of the analysis, all parents who had completed the one-year intervention and provided the required time-use data were included, giving a total of forty parents of twenty two children.

Attrition

Analyses were conducted to identify different patterns of attrition. The analysis revealed no statistically significant differences between the participating parents and the drop outs concerning the parents' age, BMI, marital and employment status, number of children, child gender, or child BMI at inclusion. However, parents in the dropout group had a lower level of education that was statistically significant (p=.003). The socio-demographic characteristics of the total randomised sample is presented in Table 2. The LiLi participants fulfilled the intervention and provided the time use data. LiLi participants who decided not to write time-use diaries during the intervention, are treated as measurement attrition. Parents who never came to the group sessions are presented as dropouts (treatment attrition).

Table 2. Socio-demographic characteristics among parents of children randomised to Lighter Living (LiLi), participants Papers II-IV.

Characteristic	**LiLi participants** *with time use data* *n*=40	**LiLi participants** *missing time use data, n*=12	**Drop-outs** *n*=22	**p-value**
Gender parents (female/male)	21/19	6/6	11/11	
Mothers' age mean (SD)	38 (5.4)	39 (5.9)	34 (5.9)	0.17
Fathers' age mean (SD)	40 (6.4)	40 (5.5)	35 (7.6)	0.16
Mothers' BMI mean (SD)	28 (5.6)	30 (7.6)	27 (4.1)	0.73
Fathers' BMI mean (SD)	28 (4.5)	30 (6.5)	32 (5.3)	0.17
Marital status				0.67
Married/ cohabiting	34	10	16	
Single	6	2	6	
Children in the household	*n*=22	*n*=7	*n*=11	0.16
One child	7	2	1	
Two children	10	3	3	
Three children	4	0	4	
Four children	1	2	3	
Level of education				0.003
Compulsory school	4	1	3	
Senior high school	21	2	18	
College/University	15	9	1	
Employment status				0.31
Employed	33	9	12	
Self-employed	4	0	4	
Parental leave	1	0	1	
Unemployed/sick leave	2	3	5	

Note: Data collection at inclusion, p-values show differences between groups. SD = Standard deviation.

Data collection

Different methods and instruments were used in order to reflect the multifaceted temporal and experience aspects of everyday life. As routines and regularities in families daily occupations were of central importance to this thesis, the parents' patterns of daily occupations were captured by a time-geographical method. Assessing time use was

complemented with an assessment of perceived occupational values as this may supply important indicators of the degree to which the individual is engaged in meaningful occupations. In addition, parents' and children's BMIs were measured in order to include a health related outcome.

Assessing time use

Patterns of daily occupations were assessed by using time-geographical diaries (Ellegård, 1999, 2006), given to the informants in advance of the day they themselves selected to be documented (Harvey, 1999). In Paper I and II the self-administered time-geographical diaries were written by all participants individually over the course of one ordinary weekday (Monday to Thursday). In Paper I, this took place twice, with an interval of ten weeks between the instances. In Paper II, the diaries were collected from all parents (couples wrote on same day) at baseline when entering the intervention. It was assumed that the participants' patterns of daily occupations had not, at this stage, been affected by the intervention. The time-geographical diaries were used repeatedly during the intervention programme and in Paper III and IV they were used in series to clarify when, where and with whom the parents spent their time over the course of 24 hours. In order to capture the participants' own perspectives of what they were doing, the diaries had an open format, except for headings regarding what time it was (when changing occupation), what occupation was being performed, where the person was, whom they were with, what they had to eat and additional comments regarding their state of mind during the occupation (Ellegård, 1999). The usefulness of this method has been tested in previous studies which aimed to facilitate reflection on patterns of daily occupations (Liedberg et al., 2004; Nordell, 2002). To ensure the validity of the data collected, the participants, rated on a five-point scale (graded from 5 = very well to 1 = not at all), how well the documented day represented an average day in their current daily life. The median rating of the documented days was 4.7 (Paper II) and 4.6 (Paper III-IV).

The participants wrote a total of 182 diary entries in Paper III, and 220 in Paper IV, an average of six occasions throughout the programme and all seven days of the week were represented. All first diary entries were written on a weekday because of the parents' varying patterns of time use between weekdays and weekends, the diary entries were categorised to weekday and weekend and analysed separately (see Figure 3).

Transformation of diaries into graphs

The time-geographical diary data collected (Papers I-IV) were coded and converted into graphs which illustrated the sequences of the occupations performed by the participants. The graphs were constructed by means of the software program DAILY LIFE version 2008 (Ellegård & Nordell, 2008). The program includes a categorisation scheme and a coding system of 600 general types of activities through which the diaries are converted into computerised illustrations (Ellegård, 1999, Ellegård, 2006). The graphs illustrate

how occupations, places, social networks and state of mind intertwine over the course of 24 hours. Thus, each graph comprised 1440 minutes.

Stimulated-recall interview

In order to capture the participants' reflections on how and why they engaged in occupations to different extents and in certain ways, the time-geographical diaries in Paper I were complemented with an open interview, two to five days after the second day recorded in the diary. This approach was inspired by the stimulated-recall interview technique used in educational research (Calderhead, 1981; O'Brien, 1993). Bloom (1964) first described the stimulated-recall technique as being crucial in stimulating and enabling a subject to relive an original situation with vividness and accuracy. The participants were, first asked, when looking at the graph, to recall the second day recorded, and to use their own words when describing it. The graph was used as a visual support to recall their memory and to provide a setting to facilitate the reflective process. The guidelines for conducting a stimulated-recall interview, as presented by O'Brien (1993) were followed. The participants were encouraged to reflect on the occupations they had performed over the course of that day, and to describe what they had done and how they had done it. Because self-reporting was essential, complementary questions were only used in order to clarify and deepen the understanding of the participant's reflections during the interview. Examples of the probing questions asked, were as follows: How did you come to participate in different occupations during the 24-hour period in the way that you did? Were there any main projects going on during the day, and if so how visible is that project in the graph?

Thereafter, the participants were asked to look at the graph emanating from the first time-geographical diary, written ten weeks earlier. Probing was used to elicit clarification and confirmation of whether the informants were able to reflect upon and recognise similarities in and differences between the two days reported.

A room at the university was used for the interviews. Each interview lasted 60–80 minutes and was recorded in full as an MP3 file. The recorded interviews were transcribed verbatim. To maintain confidentially, pseudonyms were used.

Occupational value

In order to assess the participants' perceptions of the occupational value linked with daily occupations, the Occupational Value instrument with pre-defined items (OVal-pd) (Eklund, Erlandsson, & Persson, 2003) was used at the beginning and at the end of intervention (Paper III and IV). OVal-pd is a self-rating instrument, each item describing separate aspects of perceived occupational value. Items intended to reveal concrete value, e.g. "something important was accomplished", items with symbolic value, e.g. "led to other people getting in touch", and items representative of self-reward value e.g. "true pleasure to do those things". The respondent is asked to state how frequently

he or she has perceived the different aspects of occupational value during the previous month by choosing one of four ordered response alternatives: not at all (1) to very often (4). The scale ranges from a minimum of 18 to a maximum of 72 points. Psychometric evaluation of the OVal-pd has been conducted. Convergent validity evidence supported the underlying dimensions of value (Eklund, et al., 2003). The 26-item version was evaluated using a Rasch analysis, which resulted in a revision and the exclusion of eight items (Eklund, Erlandsson, Persson, & Hagell, 2009), the revised 18-item version was used in this study.

Body mass index

The children's weight and height was measured at the CHC on the referral date, and in a standardised way by one of two registered paediatric nurses, at inclusion, after six months and at the end of intervention. BMI was calculated as weight (kg) divided by height (m) squared, BMI=kg/m2. BMI standard deviation scores (BMI z-scores) were obtained for the age- and gender-specific reference values of Swedish children (Karlberg, Luo, & Albertsson-Wikland, 2001, 2002). The terms overweight and obese were defined by isoBMI according to the definition by IOTF described in Cole et al. (2000). The BMI of both parents was measured at inclusion.

Questionnaire

A questionnaire was used at inclusion (Papers II-IV) and following the one-year intervention (Paper IV). It was specifically developed for LOOPS and had a solid content. The following data were selected from the questionnaire.

Socio-demographic data

Socio-demographic data, such as age, gender, marital status, educational level, employment status, finances, type of housing and number of children, were collected using the questionnaire.

Experience of control

The Swedish version, Mastery-S (Eklund, Erlandsson, & Hagell, 2012), of the Pearlin Mastery Scale (Pearlin, Lieberman, Menaghan, & Mullan, 1981) was used to assess to what extent the parents felt that they were in control of things that happen in their lives, currently. It is a self-reported assessment of self-mastery with seven statements, rated from 1 = strongly agree to 4 = strongly disagree, with a total score ranging from 7 to 28 points, where a higher score indicates a higher degree of perceived self-mastery. The original instrument has shown satisfactory psychometric properties (Pearlin, et al., 1981) and good internal consistency (Majer, Jason, & Olson, 2004; Marshall & Lang,

1990). Mastery-S has also been tested for psychometric proprieties and found to provide valid and reliable data (Eklund, et al., 2012).

Subjective health

An overall estimation of subjective health was obtained by using the single question, "In general, how would you say that your health is?", with four response alternatives from 4 = excellent to 1 = poor.

Satisfaction with everyday life

Overall satisfaction with everyday activities was measured with the single question, "In general, how would you say that your satisfaction with your everyday activities is?", with five response alternatives from 5 = excellent to 1 = poor.

In addition parents' frequency of attendance in the LiLi intervention and the number of diaries written during the intervention were recorded and used in Paper IV.

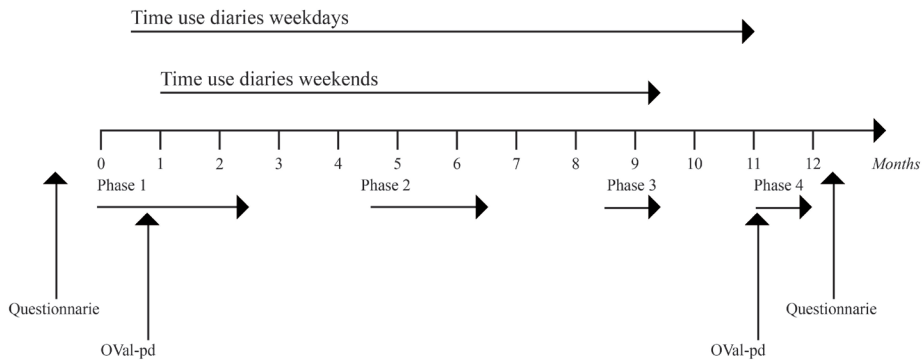

Figure 3. Example of data collected during the LiLi intervention. Phase 1-4 describes the location in time for the intervention.

Data analyses

Qualitative analysis

Qualitative content analyses were used in order to describe, interpret and identify patterns and themes in the participants' stories or graphs. Paper I and II had a qualitative approach, with similar but slightly different methodological approaches. In order to prepare and organise the data, similar steps were taken, for example, when transforming the diaries into graphs. In Paper I the interviews were transcribed and transcripts

were read several times, and in Paper II every single occupation in each graph was analysed, first, qualitatively and, later, quantitatively. The type of thematic content analysis described by Burnard (1991) was considered to be suitable for the analysis in Paper I, because in order to both code and search for themes, the entire dataset had to be comprehended. The information from the graphs and the interviews was integrated and viewed as a single set of information. The various steps of the analysis were carried out as an iterative process by the authors, e.g. codes with similar content were grouped into subcategories by the first and the third author separately. In order to ensure various aspects of trustworthiness the second author did not participate in the preceding steps, so as to avoid researcher bias, and became involved in the very last phase of the analysis, when agreements on subcategories, categories and the theme were made.

Mixed methods approach

In the qualitative phase of Paper II, the data constituting the transformed diaries (graphs), was analysed using a manifest qualitative content analysis approach (Graneheim & Lundman, 2004), conducted in several steps. In the initial steps the first author independently analysed the data by viewing and reading the graphs in order to identify those occupations the participants commonly performed in their everyday context. In a later phase the second and third author entered the analysis process and peer-examined the steps in the analysis to ensure the trustworthiness of data interpretation (Patton, 2002). The first phase of qualitative data analysis was followed by a second phase of quantitative data analysis using a sequential exploratory strategy (Creswell, 2009).

The collected time use data from all participants was analysed quantitatively by counting minutes spent in occupations related to each of the types of doing, identified in the first phase, respectively. All the time use data in each graph were sorted into the categories revealed during the analysis process when the authors discussed and came to an agreement regarding the codes for type of doers and types of doing. In this way, it became possible to detect and ensure different characteristics in the parents' shared patterns. To validate the differences, the mean time spent on each type of doing for each family type was calculated and a one-way between-groups ANOVA was conducted. Post-hoc analyses were performed to determine whether there were differences in time use in each of the five types of doing across the different family types.

Quantitative analysis

Depending upon the type of variables as well as on the distributional characteristics, parametric or non-parametric methods were chosen. The statistical methods used in the analyses are shown in Table 3.

Descriptive statistics

Descriptive statistics were used to describe the characteristics of the participants in order to present frequencies and the means and medians of different variables (Papers II-IV). It was also used to check variables for any violation prior to doing other statistical analyses, e.g. assessing normality, and linearity, and checking for outliers. Standard descriptive statistics (mean and SD) were computed for BMI score (Paper III and IV).

Internal consistency

The internal consistency was controlled for in the Oval-pd 18-item version. The alpha values (Cronbach, 1951) in the group of 30 participants in Paper III was .80 and in the group of 40 participants in Paper IV .90. For group comparisons an alpha value of .70 to .80 is regarded as satisfactory (Altman, 1993) and thereby the reliability for the summarised scores in the OVal-pd was considered adequate.

Table 3. Statistical methods used for analysing data.

Statistical methods	Paper II	Paper III	Paper IV
Descriptive statistics	X	X	X
One-way between-groups ANOVA	X		X
Post-hoc test	X		X
Linear regression analysis		X	X
Mann-Whitney U-test		X	
Wilcoxon signed rank test		X	X
Kruskal-Wallis test		X	
Cronbach's alpha		X	X
Paired-samples t-test		X	X
Repeated measures ANOVA		X	X
Chi-Square test			X
Pearson's correlation coefficient			X
Multiple regression analysis			X

Intra-group and inter-group comparisons

The paired-samples t-test was used to compare the mean scores of children's BMI z-scores on two separate occasions, i.e. before and after the intervention (Paper III and IV). The repeated measures ANOVA was used to measure a linear trend in the children's BMI z-score from referral to the end of the intervention and whether there were differences between the family types in Paper III and IV. Differences between and within groups were analysed using non-parametric tests, the Mann-Whitney U-test was used to compare the mother's and father's perception of occupational value (Paper III) and the Wilcoxon signed-rank test was used to evaluate any differences in perceptions of occupational value (Paper III and IV). To compare data that was continuous and normally distributed from more than two groups, the one-way between-groups ANOVA was used (Paper II) with additional post-hoc tests in order to analyse statistically significant differences in time use according to family type and, in Paper IV when performing attrition analyses. The chi-square test was used for nominal data when the data was categorical distributed, e.g. the socio-demographic variables (Paper IV).

Relationships between variables

In order to describe the correlation between different variables the Pearson's correlation coefficient (r) was used (Paper IV). By generating scatterplots, the direction of the relationship between variables was inspected. Linear regression analyses were used to determine parents' time use change in the three areas of occupation, preparing and having meals (PM), physically active activities (PA) and physically inactive activities (PiA) over the course of the intervention (Paper III and IV). The Kruskal-Wallis test was used to explore any statistically significant differences in parents' time use in four time-periods during the interventions (Paper III). Multiple linear regression analyses (backward) were used to examine the relationship between parents' change in time use and various potential predictors and parental predictors explaining children's change in BMI z-score (Paper IV).

A p-value of <.05 was regarded as significant except in the post-hoc analysis where a reduced p-value was used, in accordance with the Bonferroni adjustment (Pallant, 2010). Analyses for Paper II were conducted using The Statistical Package for Social Sciences for Windows (SPSS, version 17.0); analyses for Paper III and IV were conducted using SPSS (version 18.0).

Ethical Considerations

Research involving the parents of young children has the potential to violate the family's autonomy and integrity. To prevent such effects the Declaration of Helsinki, a statement of ethical principles to provide guidance for medical research involving human subjects (Normile, 2008), was followed. When research involves human partici-

pants, the researcher has a responsibility to ensure the interests of the participants are protected. Ethical principles of autonomy, non-maleficence, beneficence and justice were conformed (Beauchamp & Childress, 2001). A responsible paediatrician provided the parents with verbal information about the study in which, it was emphasised that participation was voluntary and that the reporting of data would be confidential. All participants received information that they were free to end their participation in the intervention at any time. Withdrawal from the RCT or an incomplete or a total lack of participation in the intervention would not affect their child's chances of receiving help with their weight condition in any way. Standard treatments designed for the individual needs of the child were offered. The participants were also informed that they could choose not to answer the questionnaires, and they were given contact numbers to use in case the questions raised issues or reactions.

The children were not directly involved in the intervention, however, children were considered, whenever possible, on their own opinion whether or not to participate in the clinical weight and height measurements. All children were under the age of 12, and they were all informed verbally and asked for assent to participate. The child was not present when the parents received information. The parents were given time for consideration before the parents talked to their child and were asked to consent/assent. The participants were informed that the data collected during the intervention would be treated confidentially and stored safely in a locked area. All data were coded and no single participant could be identified in the final data file used for analysis. All parents participating in the LiLi intervention had the opportunity to receive feedback on their reported time use data and their goal attainment.

Beneficence and non-maleficence refer to the values of and benefits for the participants and the duty of the research team to ensure that they do not experience any harm (Beauchamp & Childress, 2001) To identify children at a routine visit to the CHC may be seen as an intrusion into the family's privacy. Parents of overweight and obese children could, possibly, feel that they are being stigmatised as parents who are not good enough and they are being placed in a vulnerable situation. The inclusion criterion was the child's high BMI for their age. Children are in relationship where they are dependent on their parents choosing to recognise their child's high BMI as a health risk. The parents were asked if they would accept a referral to the Children's Hospital in order to receive more information about their child's health condition. Being given the opportunity to participate in a RCT and not knowing which type of intervention they were going to receive might have been seen as threatening by some parents, even if every precaution was taken to prevent this perception. The questionnaires given to the parents before entering the intervention might have raised thoughts and discussions that would otherwise not have existed. It is possible that some questions caused the parent to think that they had a poor quality of life or that they did not spend enough time with their family.

All data collected from parents and children before and during the intervention was protected by having a single master list of enrolled subjects. This list which had the children's names, code numbers and collected data was only known to the paediatrician

and the two paediatric nurses involved in the project. Precautions were also taken in order to ensure that all parents enrolled in the intervention felt welcome, comfortable in the group session and supported. The evening sessions took place in an environment outside of the Children's Hospital; the same two group leaders worked with the parents throughout the intervention. The sessions, thus, reduced the time the parents had available to spend with their children. However, parents were able to spend time together and discuss their child's development. Such an opportunity may, in the long-term influence the parents to be engaged and spend more time with their children.

The principle of justice refers to the sampling procedure, meaning that it should be conducted fairly (Beauchamp & Childress, 2001). Justice in the recruitment process with a non-discriminatory objective was emphasised. All children who were identified as overweight or obese were invited to participate in LOOPS. Children with obesity were, however, not randomised to a control group because it was not found to be ethical to do so when parents were seeking help and attention in order to address the problem. The only criterion for not including a child with obesity in LOOPS was that if the parents did not understand written and spoken Swedish well enough to participate in group sessions they were not included in the study. This consideration meant, however, that a group of non-Swedish speaking migrant parents were unable to attend. This group received the offer of standard treatment at their local CHC.

The Intervention study was approved by the regional ethical review board in Lund, Sweden (Ref. no.: 159/2008).

Results

The usefulness of a time-geographical diary method

The time-geographical diary method, in combination with interviews, did enable the participants involved to reflect on their patterns of daily occupations. The results indicate that the attempt to apply constructive perspective to time use was useful. By letting each individual compose their own diary, noting how, when and for how long the individual moved between places and with whom, it revealed how daily occupations in one way or another were intertwined with those of others involved in their social context. The graphs illustrating the sequences of activities performed by the individual were both the main facilitator, allowing the participants to reflect and enabling them to identify their own patterns of daily occupations. When the patterns were made visible in the graphs, and when it was possible to compare one graph to another, the participants became aware of their patterns of daily occupations (Paper I).

The ability to reflect on one's own doing and on others' influence over what gets done was described using a main theme and four categories (Figure 4) illustrating how the participants reflected on their own patterns of daily occupations and the changes that were visible when viewing and comparing the graphs from two typical weekdays. The main theme was termed "New insights came to light concerning the scope of patterns of daily occupations". Within this theme, it was shown that the participants reflected upon and expressed how daily occupations were in a constant stage of change. They suddenly realised how their children developed new skills and changed their behaviour, which led onto the awareness of that there were new challenges ahead and different needs to be met. The informants stated how they had identified these changes and re-organised their routines, and also how they could now see how their patterns of daily occupations had changed (Paper I).

When the informants reflected on what had happened over the course of the two specific days they reported on in their time-use diaries and the differences between occupations performed on those two days, they also became aware of the presence of sudden opportunities which they had not expected. From the graphs, they could identify their projects, some of which were conducted by themselves and some which were coordinated together with others. They described how they felt that some desires and needs were put on a waiting list as a result of there being too many demands on the time they had available. However, both informants recognised the support they

received from their social network and described this as an important part of daily life and a prerequisite for maintaining their control (Paper I).

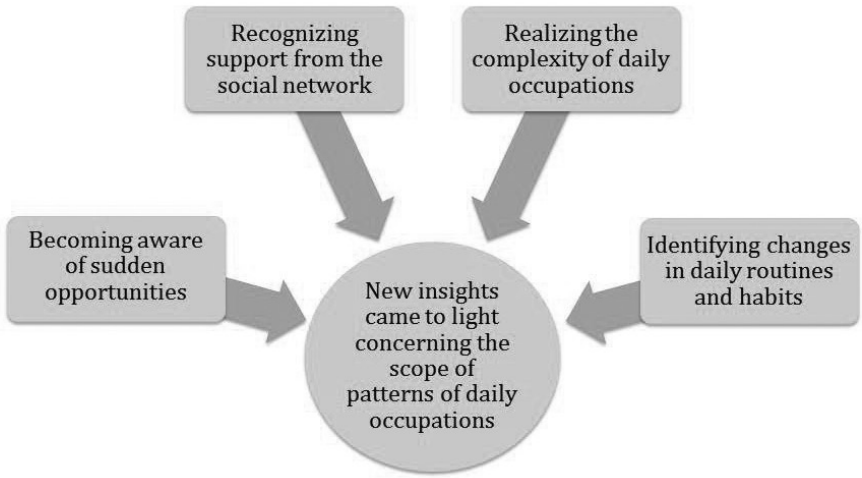

Figure 4. The main theme and the four categories, which abstracts the informants reflections (Paper I).

Characteristics of shared patterns of daily occupations

When investigating the time use data, four main family types were found and were labeled *the togetherness focused family*, *the child focused family, the individual focused family* and *the parent-child focused family* (Paper II). These groups' shared patterns of daily occupations differed in terms of the amount of time spent among the groups of doers and the types of doings.

Shared patterns of daily occupations were defined by: a) how much time each parent spent on different occupations, b) which occupations were distributed between the parents in time and space, and c) who was responsible for the coordination of the occupations related to the family's projects.

It was necessary to identify all parents' occupational performance (doings) over the course of 24 hours in order to detect and describe patterns. Occupations which were considered relevant to the aim of the study were identified and analysed both qualitative and quantitatively. The five categories used in the analyses came to be: 1) parents together with the child, 2) parents without but for the child, 3) parents' individual time, 4) parents together and 5) sleep.

The different characteristics, identified in the couples' shared patterns, were used to classify each couple into one of four family types: the togetherness focused family (n=4), in which parents spent time with children (15%) as well as time together (18%); the child focused family (n=10), in which parents spent time with children (21%) and

a few minutes together (3%); the individual focused family (n=4), in which parents had minimal time for children (7%) and togetherness (5%); and the parent-child focused family (n=12), in which one parent spent time with children (15%) and the parents spent a moderate amount of time together (8%).

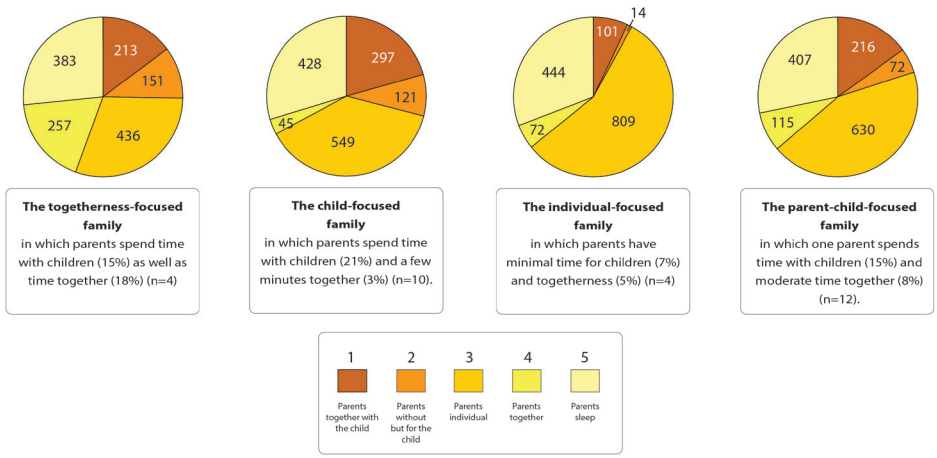

Figure 5. Time use in four different family types, minutes spent in five categories of doing during 24 hours.

Differences between mothers' and fathers' time use

Different patterns of daily occupations in families

Parents' patterns of daily occupations differed in relation to how parents (couples) divided family projects between themselves. There was a statistically significant difference in the amount of time spent in the five categories between the family types (p=<.001). Examples of such differences in the first two categories are presented below.

In *the togetherness focused family*, mothers were responsible for 42% and fathers for 58% of co-occupations involving their children and occupations not involving, but performed for the child. The parents collaborated in most childcare occupations throughout the day. In the evening the family had dinner together, parents shared children's bedtime routines and after the children gone to bed, the parents spent time together watching TV.

In *the child focused family* mothers were responsible for 63% and fathers for 37% of co-occupations involving their children and in occupations performed for the child. Both parents helped the children with morning routines. In the afternoon and evening they each spent time with their children, separately. After the children were in bed the

parents watched TV, the mothers did some household and computer work, and all fathers in this group did some sort of computer work, before going to bed.

In *the individual focused family,* mothers were responsible for 100% of co-occupations involving their children and occupations performed for the child. The mothers helped the children with morning routines, while the fathers continued to sleep or prepared for work. After coming home from work, the mothers quickly prepared food together with the children, had dinner, watched TV and put the children to bed. Mothers in this group watched TV and played computer games in the evening. One father went to work in the afternoon and worked until late at night. The other father arrived home late at night, had dinner alone and watched TV, while his partner played computer games.

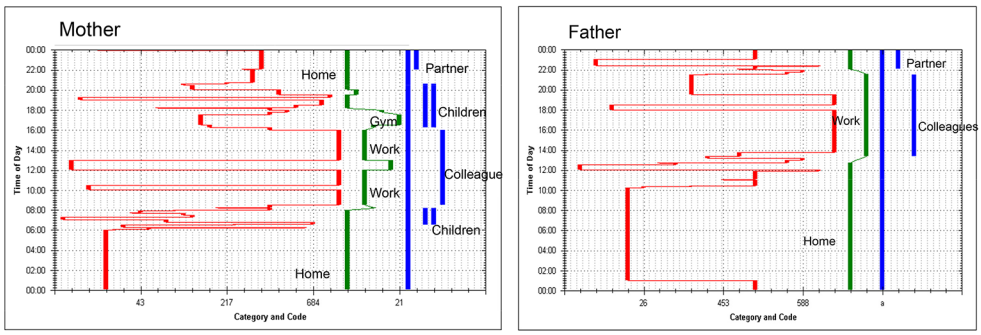

Figure 6a. Graph illustrating parents' typical time use in *the Individual-focused family* over a 24 hour period.

In *the parent-child focused family*, mothers were responsible for 74% and fathers for 26% of co-occupations involving their children and in occupations performed for the child. The mothers helped their children in the morning, took them to preschool and picked them up in the afternoon. The family had dinner together and then mothers took care of the household work. Fathers played with the children and parents collaborated with helping their children to bed. Later in the evening, fathers in this group worked on their computer for one or two hours and watched TV together with their partner before going to bed.

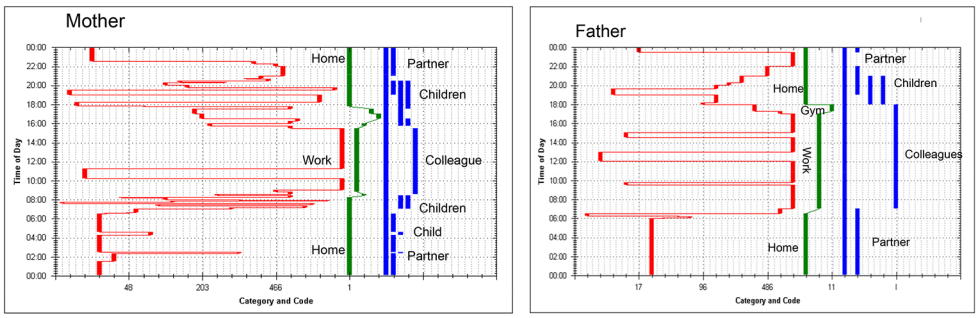

Figure 6b. Graph illustrating parents' typical time use in *the parent-child focused family* over a 24 hour period.

To what extent mothers' and fathers' time use vary

The difference between mothers' and fathers' time spent together with their children was significant in all family types. In most cases the mothers spent more time together with children than the fathers did. A similar situation was uncovered in the category, parent without, but for the child (see Figure 7).

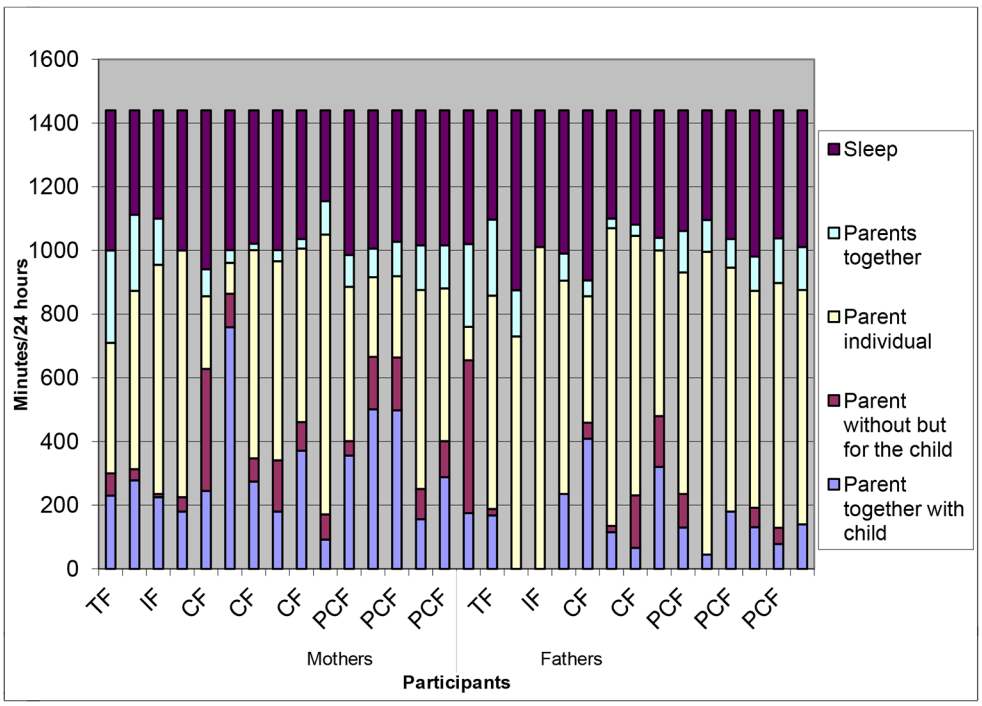

Figure 7. Mothers' and fathers' time use over the course of 24 hours.

Changes in the amount of time parents' spent together with their children

It was possible for the majority of parents to change the amount of time they spent together with their children over the course of the LiLi intervention (Paper III). Fathers were particularly successful in increasing the amount of time they spent with children on weekdays. The change in total time the parents spent together with their children during weekdays in the three areas of occupation, preparing and having meals (PM), physically active occupations (PA) and physically inactive occupations (PiA), was statistically significant (p=.042) for both mothers and fathers (Paper III). For example, parents spent an average of 107 minutes (min) together with their children during a typical

weekday at the beginning of the intervention, and an average of 160 min at the end. This is, on average, an increase in the amount of time spent in co-occupations involving children on a typical weekday of 58 minutes. In Paper IV, it was shown that parents increased the time they spent together with children by an average of 91 minutes per day (p=.028), in particular, physically active occupations (p=.015). The increase in the amount of time fathers spent together with their children on weekdays was statistically significant (p=.030).

Mothers spent more time with their children than fathers did, both at the beginning and at the end of intervention. In the first diary entry, mothers reported spending 137 minutes, on average, together with their children on a typical weekday and 193 minutes at the end. Fathers reported 78 minutes in the first diary and 127 minutes at the end. However, fathers increased their time spent with children on weekdays by 88% during the period seven to nine months. Over the course of the same period mothers increased the amount of time they spent together with their children on weekends by 71%, the increase was mainly time spent involved in physically active occupations (Paper III).

There was a statistically significant increase (p=.040) in time spent involved in physically inactive occupations together with their children during the weekdays, and a decrease during weekends, the mothers, in particular, decreased the time spent involved in PiA at weekends. Instead, the mothers increased the time they spent involved in PA with their children on a typical weekend day by 72 minutes, on average.

The analysis of different time periods throughout the intervention (1-3, 4-6, 7-9 and 10-12 months) also showed a statistically significant increase in the time fathers spent in involved in PM (p=.017) together with their children on weekdays (Paper III). This means that, fathers on average changed their patterns of daily occupations to spend 24 minutes more on preparing and having meals together with their children on weekdays.

Time use change according to family type

Over the course of the intervention, there was a statistically significant increase in the amount of time that parents in *the togetherness focused family* and in *the child focused family* spent together with their children involved in physically active occupations (Paper III).

Parents in *the togetherness focused family* group displayed a statistically significant increase in the amount of time they were involved in PM on weekdays, 79 minutes in Paper III (p=.049) and 53 minutes in Paper IV (p=.002). Parents in this group were also more physically active (PA) together with their children on weekends, 269 minutes in Paper III (p=.018) and 168 minutes in Paper IV (p=.008). *The child focused family* group displayed a statistically significant increase in the time spent involved in PA on weekdays (p=.011) and PiA on weekends (p=.043), shown in Paper III and IV.

Table 4. Average time use change in minutes according to family type (n=30, Paper III)

Family type	Average changes Total time	95% CI	p-value	PM	p-value	PA	p-value	PiA	p-value
Togetherness focused (n=4)	86	-159-332	.048						
Weekdays				79	.049	6	.863	-22	.406
Weekends				194	.133	269	.018	14	.886
Child focused (n=11)	77	-121-275	.441						
Weekdays				15	.556	41	.226	42	.043
Weekends				20	.795	355	.011	-25	.533
Individual focused (n=4)	110	-121-341	.333						
Weekdays				49	.206	6	.612	12	.492
Weekends				28	.690	-55	.421	58	.232
Parent-child focused (n=11)	32	-99-163	.625						
Weekdays				3	.911	4	.881	32	.141
Weekends				30	.496	14	.715	-30	.387

Note: PM = preparing and having meals; PA= physically active; PiA=physically inactive occupations.
Average change= Mean time use change in minutes per day (during one year).
95% CI= 95% Confidence interval of the average change during one year.

Changes in parents' perception of occupational value

Parents' perceptions of value in daily occupations displayed a statistically significant increase, both in Paper III (p=.013) and in Paper IV (p=.002). The median occupational value score in the total sample increased by 2.5 score in Paper III and 4.5 in Paper IV. The analyses in Paper III showed a statistically significant increase in mothers' perceptions of self-rewarding value (p=.021) and in fathers' perceptions of symbolic value (p=.027).

Changes in children's weight status

Children's BMI z-score decreased by a statistically significant amount from primary referral, 3.35 (.70 SD), to the end of intervention, 2.81 (1.08 SD) (p=.008), resulting in a mean decrease of -.53 units (.72 SD), ranging from (-.16 to -.90) (Paper III). A decrease was noted from 3.08 (.96 SD) at inclusion to 2.93 (1.05 SD) at the end of the intervention, -0.15 (.56 SD) 95% CI [-0.11-0.40] (p=*n.s*) (Paper IV).

The result turned out to vary between the family types. The BMI z-score of the children in the *togetherness focused family* decreased significantly more that of those in the other family types (p=.002). A statistically significant linear trend of decreasing BMI was shown from primary referral to inclusion, and in three of the four family types from inclusion to the end of the intervention (p=.022) (see Figure 8). In Paper IV, a similar trend was shown from inclusion to end of intervention. Children in the *togetherness focused family* and in the *child focused family* decreased their BMI z-score statistically significant more than other family types (p=.007).

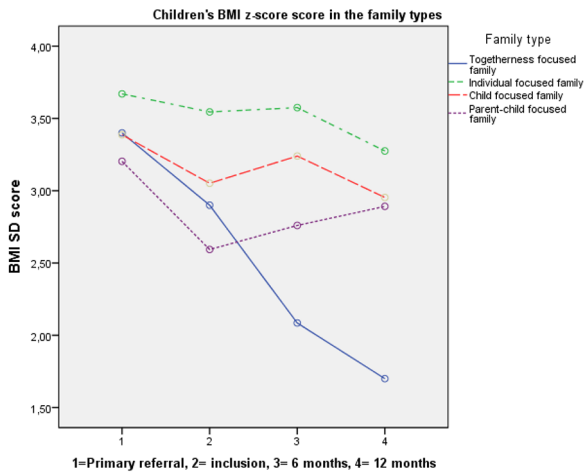

Figure 8. Children's BMI z-score (mean), at primary referral, inclusion, 6 months and 12 months (17 children, Paper III).

Factors related to changes in parents' time use

Multiple linear regression analyses resulted in a final model that was statistically significant (p=.038) and explained 17.3% of the variance in parents' total time use (including PM, PA and PiA) (see Figure 9). Factors associated with the parents' time use changes were: adequate finances, low self-mastery at inclusion, satisfaction with everyday activi-

ties and parents' BMI. Predictors for time use change in physically active occupations (PA) were: number of diaries written during the intervention, adequate finances, increased perception of occupational values and low self-mastery at inclusion, together explaining 18.5% of the variance (p=.031). Predictors for time use change in PiA were: parents' adequate finances, BMI at inclusion and lower perception of occupational values, together explaining 26.4 % of the variance (p=.004). It was the parents with lower BMIs than the mean (28) at inclusion that turned out to predict the time use change (Paper IV).

Factors related to changes in children's BMI z-score

Factors associated with parental characteristics which predicted changes in children's BMI z-score were: fathers' increased perception of occupational values, mothers' high self-mastery at inclusion, parents' high self-rated subjective health and fathers with a university education. The final model was statistically significant (p=<.001) and explained 66.8% of the variance when using adjusted R^2 (Figure 9).

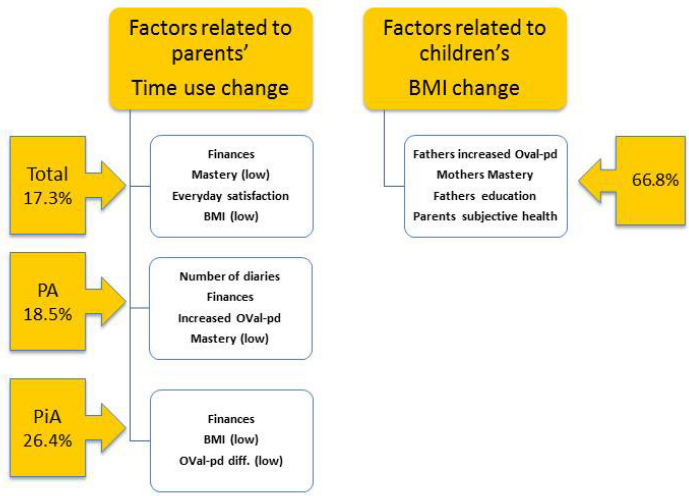

Figure 9. Factors related to change, when the adjusted R^2 for model was applied. Independent variables entered into the regression analyses: OVal-pd difference, mastery, subjective health, satisfaction with everyday activities, education, finances, parents' BMI, frequency of attendance in the LiLi intervention and number of diaries.

Discussion

The overall aim of this thesis was to investigate the usefulness of a time-geographical diary method in order to facilitate reflections and to explore shared patterns of daily occupations among parents of preschool-age children with obesity. A further aim was to investigate parents' change in time spent together with their children and their perceptions of occupational value during a one-year intervention. Factors related to any changes in the parents' time use as well as any change in the children's BMI z-score, respectively, were also investigated.

Parents synchronised their daily routines differently (Paper II) and one of the main findings suggest that parents who synchronise their daily routines to include co-occupations together with their children may be able to increase the amount of time spent with children. This was seen in Paper III when parents in the togetherness focused family group and in the child focused family group displayed a statistically significant increase in time spent together with their children in e.g. physically active occupations during weekends. Numerous contextual factors were shown to facilitate or constrain what individuals choose to do (Paper I). This thesis supports the use of time geographical diaries transformed into graphs illustrating patterns of daily occupations as a facilitator for reflections that may be useful for a process of change and increased health. Fathers' involvement in children's daily occupations seems to predict changes both in time use and in children's BMI (Paper IV). However, the amount of time spent in various occupations during 24 hours tells us very little about the quality of someone's life. For example the amount and types of physical activity that are optimal for young children remain uncertain, and at the same time the WHO states that at least 60% of the global population fails to achieve the minimum recommendation of 30 minutes moderate intensity physical activity daily (WHO, 2004). The main concern in this thesis was not to focus on the exact amount of time spent with children during various occupations, it was more to influence the participating parents to look for a balance between physically active and physically inactive occupations in order to maintain health in the family. Furthermore, physically active occupations are one of many occupational areas that need to be considered when untangling and trying to understand individuals' patterns of daily occupations and their relationship to health.

The usefulness of time geographical diaries

The graphs illustrating sequences of patterns of daily occupations may constitute an important facilitator to enable reflections. The time-geographical diaries converted into graphs, used in combination with stimulated-recall interviews did enable the informants to reflect upon their patterns of daily occupations (Paper I). Furthermore, when comparing the two reported days, the informants identified changes in daily routines they were not aware of, which in turn led to new insights. The informants brought up complex situations and how it became obvious to them that daily occupations are always in a state of change. For example, the informants described how they performed occupations simultaneously and how they often moved from one occupation to another resulting in that the occupation was not performed as it was before. This is in line with so called unexpected occupations which are described as occupations interrupting the ongoing flow of daily occupations (Erlandsson & Eklund, 2001), and also with so called enfolded occupations (Bateson, 1996) which were identified in Paper I, where the informants became aware of how they performed many occupations simultaneously. However, the informants emphasised how daily routines such as regular working hours and school routines provided a structure in daily life. This can be understood in terms of the Eco-cultural theory, based on the idea that engagement in more sustainable routines and occupations produces well-being (Weisner, 2002). Since, the graphs enabled the informants to reflect on reasons and meanings allocated to certain choices they had made during the day (reported in the diary), it may be a useful method to use if routines and habits need to be changed to support a healthier lifestyle. Furthermore, sudden opportunities for alterations in the pattern were discovered and described by the informants and such reflections were observed to work as facilitator for increased awareness. This awareness might be a first step for increased motivation for change.

Reflections and its implication for change

Reflections during the intervention

Time spent at work seems to be the easiest and most obvious part of a pattern of daily occupation to identify; taking care of the household and children were identified as second, by the participants. This is in line with previous studies showing how child care was recorded in diaries as a *secondary activity* far more frequently than as a *primary activity,* e.g. work (Harvey & Pentland, 2010). According to Erlandsson and Eklund (2001) occupations dominating a pattern of daily occupations may be defined as *main occupations* and occupations belonging to but not dominating patterns as *hidden occupations*. When the participants observed their graphs several reflections arose. It can be assumed that in the open diary, where the participants themselves had reported their doing they probably were most aware of occupations they experienced as their *main occupations.* However, when transformed to graphs (almost like a "map"), the content of their diaries came

to another light for the diarist. It became evident how the time spent during the day reported in the diary now revealed both *main occupations* and previously *hidden occupations.* In this map the continuous sequences of occupations performed by an individual also included other family members i.e. their children. Since it was the parents' doing that was documented in the diaries children's occupations were captured indirectly (as a primary or secondary occupation). Play occupations with children occurred both indoors and outdoors, even though, most co-occupations with children in the beginning of the intervention were spent in self-care and meals (Paper III). Time spent engaged with children appeared to be more "invisible" in fathers' diaries than in mothers, which suggests that fathers have different patterns of daily occupations than mothers.

If change in patterns of daily occupations is required within a family, solid theoretical information may not be enough for implementing a change. The "learning by doing" approach first described by Dewey (1900), an American philosopher, as the requirement to establish new skills and habits has been emphasised in many intervention programs for the last decades. Dewey described the need to have concrete experiences in order to learn new skills and the importance of the experience/knowledge being delivered concurrently with a sense of a need for the new knowledge. Schön (2003) investigated the concept of reflection, describing the idea that reflecting together with others may reveal new knowledge. This underscores the importance of involving both parents in the process of change, and more specifically how time geographical diaries turned into graphs may be used to facilitate initiatives for change by enabling reflections on how daily occupations are integrated in both time and space.

Change was not possible to achieve for all parents participating in the LiLi programme. However, most parents exchanged thoughts about how they experienced an unbalance between time spent with the family and time at work and other obligations exterior from the home. Requests were often argued for in regards to an alteration in the way daily routines were performed. Previous research has shown similar findings, e.g. individuals who work long workdays have difficulties to change their patterns (Marks, Houston, Johnson, & MacDermind, 2001). The social context, such as family members and colleagues, affects the individual's experience of balance in daily occupations (Erlandsson & Håkansson, 2009). An individual's pattern of occupations is coordinated and synchronized with other individuals' patterns. In a family, for example, all members' patterns of occupations are dependent upon and influenced by each other. This complex relationship also means that a change in one individual's pattern affects other family members' patterns. Similarly, a change may be more difficult to implement due to the nesting of the people whose activity patterns are intertwined. This complexity was illuminated in Paper I, and in parallel, many parents became aware of it during the LiLi intervention. Most couples used their graphs as a tool to find concrete situations to discuss. They highlighted actual existing situations, compared each other's graphs and discussed possible strategies for change. The participants' experiences of complexity in their daily life and the hindrances for change are possibly shared by most dual working parents in Sweden and the western society today. For many people, not just parents, this complexity itself serves as a hindrance for change and there might be a strong need

for applying an outside perspective. The strategy of enabling awareness through having one's own life illustrated as a map or a graph may have contributed to change in some families. Awareness may be seen as the key element in the process of change, an alteration in one's sense of competence and values have been described as fundamental for change (Kielhofner, 2008). Identified capacities may have contributed to small steps in the right direction for change in the long run.

Shared patterns of daily occupations

Shared patterns of daily occupations seemed to differ between families. At the same time, similar circumstances were identified according to the structure of daily occupations (Paper II). Environmental and social time-setters (zeitgebers) (Christiansen & Baum, 1997) such as, for example, daytime, work-schedules, mealtimes, bedtime and night time were usually similar (Paper II) and was described to help individuals maintain a daily rhythm. In addition contextual constraints were visible in the participants patterns. Constraints such as authority constraints (Hägerstrand, 1970) e.g. parents who worked night time had different patterns than others and coupling constraints were evident mostly in the mothers patterns e.g. reporting performing several occupations together with others.

The results showed that some couples shared patterns of daily occupations linked in co-occupations with children i.e. parents working together monitoring meals or bedtime routines. Other couples had very seldom synchronised daily routines, i.e., it was mainly one parent spending time with the children and the parents' occupations were not linked together. This phenomenon has previously been described by Primeau (2000a) as shared and separate routines. Shared routines were, according to Primeau, mostly seen in so called non-traditional parenting styles, where parents were able to fill in and cover for each other in child care occupations. In Paper II a similar collaboration was seen, in the togetherness focused family, in which parents who synchronised their daily routines were described as having highly shared patterns of daily occupations. Primeau (2000a) also described parents with separate routines and labelled them as having a "traditional" division of household and child care routines. In these families most fathers referred to their role as being one of "helping out" their wives and not in terms of having the responsibility. This is in line with the results in this thesis where the fathers in the individual focused family did not participate in co-occupations and did not perform any household chores during typical weekdays, which thus led to no shared routines. Likewise, some of the fathers (50%) in the parent- child focused family did not perform any household routines at all during the days for data collection, which obviously led to the conclusion that the mother completed all household work.

Most parents spent more than fifteen hours a day on individual occupations and sleep on a weekday. According to Hägerstrand (1970), it is necessary activities such as eating, sleeping and taking care of personal hygiene that everyone needs to allocate time

for. A time use survey conducted in Canada showed that the more time people spend washing, dressing or sleeping, the less time they have for occupations together with other family members (Statistics Canada, 2005). Despite this, the time parents spent in personal care and sleep did not differ significantly between the family types (Paper II).

The main purpose of identifying shared patterns of daily occupations in families was to improve the understanding of opportunities and restrictions families are facing if or when they need to change their lifestyles in order to improve their children's health. The four identified family types illustrated that such opportunities and restrictions may be evidently different in families depending on working hours but also how the household tasks and child care are divided between the parents.

Characteristics of shared patterns of daily occupations

Similarities and differences in shared patterns of daily occupations

Mothers seem to spend more time in social interactions than fathers. The results showed that mothers did not only report more time together with children, they also reported more time together with co-workers and friends than what fathers did. If the dyadic relationships in the family are the unit of analysis the researcher need to study the synchronisation of timetables and social interactions in the family (Rönkä & Korvela, 2009). The amount of time parents spend together with their children has shown to be a good indicator of a solid and well-functioning family (Greeff & Le Roux, 1999). In a Swedish study (Jonsson, 2001) children considered fathers to be absent from family occupations more than mothers. Studies from all around the world report similar findings (Baxter, 1997). Women are responsible for and complete the majority of household work (75%), regardless of their participation in paid employment (Primeau, 2000a). Western, industrialised nations, for example, report similar findings, as do countries that are less industrialised in nature and Scandinavian men do not contribute to more than 28% of the total household work (Baxter, 1997). However, previous research also shows that men are more likely to participate in child-care, such as playing, than in housework tasks (Hannah & Quarter, 1992; Primeau, 2000b). According to the findings in this study and previous research it seems like that the person who spends less time in paid work (in most cases the mother) will spend more time together with children and in household work. How and why parents share their time spent together not only with children but also in household work is however, up to the individuals. Today most two-parent families are faced with the dilemma of how to accomplish the work-family balance to meet their children's need of physical and psychological nourishment.

One important finding in this thesis it that parents who shared the time spent with children and household work almost equally in the beginning of the intervention (the togetherness focused family) also accomplished changes in their patterns of daily occupations which included even more time spent with children during preparation of meals and eating together (PM) during weekdays and in physically active occupations on weekends. The parents who spent the most amount of time together with children

in the beginning of the intervention (the child-focused family) managed to change their time use to include more time for physically active occupations during weekends. These changes in patterns of daily occupations also seemed to lead to a decreased BMI z-score in the children of these families. Thus, collaboration between the parents regarding the family and childcare related occupations seems important for enabling changes.

Parents' time use seems to be more similar on weekends. It was seen in both Paper III and IV that the differences in time use that appeared during weekdays were less during weekends. This can be interpreted as it is both parents' working hours on weekdays and gender customs that are causing this discrepancy between mothers and fathers time use. However, in Sweden most parents of preschool children to some extent have the opportunity to choose their amount of hours at work (Statistics Sweden, 2007). Employers most often offer their workers less working hours, and/or the option of working from home. Furthermore, the desire among parents to spend more time with the family is seldom viewed as a weakness or something strange. Despite this, many parents feel that they are expected to spend a sizeable number of hours at work and there is not enough of time to spend in shared family occupations (Hamilton & de Jonge, 2010) This emphasises that the differences between mothers' and fathers' time use found in this thesis might be affected by reasons other than authority constraints, such as working hours, it may also be affected by traditions and norms in the society.

Changes in parents' time use

On the basis of the findings when analysing change, using linear regression analyses for each parents' first to the last written diary, it was evident that some parents were able increase their time spent together with their children. The results showed that the parents spent on average one and half hour more together with their children at the end of intervention. The extra time devoted to children was mainly spent during meals and physically active occupations and just marginally more time in physically inactive occupations. Parents in the togetherness focused family increased their time spent together with children primarily in physically active occupations. This result indicates that parents' who collaborated in taking care of the children and in household work had a greater opportunity to allocate more time together with children. Surprisingly, also parents' in the individual focused family spent almost two hours more per day together with their children at the end of the intervention. In this family type it was, however, still the mothers who spent most time with children also at the end of the intervention.

In this thesis is it shown how fathers statistically significant changed their time spent together with their children on weekdays. Fathers in the parent-child focused family spent minimal time together with their children at the beginning of the intervention, but they somewhat managed to alter their time use during the intervention. The result in Paper III showed how fathers' final average time use spent together with children almost reached to the mothers' initial level. This is a quantified result, we still do not

know if this time use change that the fathers accomplished actually led to more "quality time" together with their children. The extra 24 minutes on average per weekday fathers spend with their children during meals might, however, lead to altered family meal routines in the future.

The extra time spent with their children must have been taken from other occupations, although it seems not to be from physically active occupations or physically inactive occupations spent together with the children since the fathers also increased time spent in those (Paper III). The results show how fathers' patterns of daily occupations shifted during the intervention with an on average increase with almost one hour extra to spend with their children a typical weekday. It can be assumed that some fathers decreased the length of their workday to be able to spend time with their children or decreased time spent watching television (which fathers reported far more often than mothers). This is in line with recent reports showing that fathers have increasingly been sharing household work, including caring for children (Statistics Sweden, 2010). Interestingly, mothers amount of time spent with children increased most on weekends, on average about two hours. Most of the increase was evident in preparing and having meals and in physically active occupations. It seems like the mothers took responsibility of the physically active occupations together with the children during the weekends. However, it seems like parents who collaborate in taking care of children and the household are also more likely to change their overall daily routines.

Factors associated with parents' change in time use

The results from this thesis indicate that parents' finances are related to their ability to change their time use (Paper IV). Time and money are important quantifiable resources that everyone is dependent on. Lack of time and lack of money is perceived as constraints to the individual. For example, studies show how mothers who feel financial strain report lower balance in everyday life (Marks et al., 2001). Since the parents' economic situation was assessed by one single question in Paper IV, this result should however, be treated with caution.

Furthermore, the number of written time-use diaries turned out to be a predictor to enable time use change in physically active occupations. This supports the time-geographical diary method used in the LiLi intervention as an important facilitator for change. The diaries enabled the parents to reflect over and identify any need for change in their patterns of daily occupations. Interestingly, the result from this study indicates that four to six diaries written during the intervention were enough to enable a time use change (Paper IV).

This result is important to consider in future development of the use of time-geographical diaries in interventions. It shows how a time-geographical approach may serve as a basis for studying the complex variety of occupations performed by individuals at home, when travelling, at work, when shopping etc. The graphs converted from the

diaries show how occupations are related to each other as time flows; the rhythm and repetition is illuminated. It can be assumed that if non-favourable habits were revealed, the participants tried to change them. For example, when parents increased their time together with children in physically active occupations it was shown in the graphs and parents thereby received feedback on their attempt to change their routines to include a more physically active lifestyle. This alteration may contribute something new to the pattern of daily occupations out of which new experiences may emerge. In line with the description of how change takes place, an alteration in volition, habituation and performance capacity are according to Kielhofner (2008) the key elements in change.

In parallel, lower scores in especially self-mastery (sense of control) reported by the mothers at inclusion turned out to predict a time use change. This indicates that mothers who perceived a lower sense of control over events and circumstances in everyday life may have had benefited more from the intervention. The changes they accomplished in time spent together with their children in physically active occupations might lead to a continued healthier lifestyle in the family, which enabling the mothers to feel more in control and content.

Parents BMI was also associated with a time use change. Parents with a high BMI at inclusion did not change their amount of time spent with children as much as parents with a lower BMI did. Parents' weight seemed to be an important predictor for increased amount of time spent with children. This may be caused by several reasons such as feeling uncomfortable in physically active occupations, a recent study have shown the capacity to engage in daily occupations to be limited due to overweight (Wilson, 2010).

Furthermore, it seems like it is achievable to change patterns of time use if the individual experiences more value and meaning in daily occupations. Parents increase in occupational values during the intervention predicted a time use change both in physically active occupations and physically inactive occupations. According to Erlandsson, Eklund and Persson (2011) occupational value is an important requirement for experiences of meaning. The dimension of concrete value is often visible and brings satisfaction to the doer through e.g. improved skills. The symbolic value of an occupation signifies communication and belonging and the self-rewarding value dimension focused on immediate rewards that are inherent the experience of occupational performance. These values can be generated both from physically active occupations e.g. walking, cycling and physically inactive occupations e.g. reading to children or singing.

Change in children's BMI and factors related to change

Several children (14 out of 22) achieved a clinically important reduction in BMI z-scores during the one-year intervention. Children in both the togetherness focused and the individual focused families especially upheld a reduction in BMI z-scores which show a slowing and decreasing weight curve. This result is in the right direction for weight normalisation. However, more research is needed to determine if the child's weight status will be normalised in the long term.

Fathers' increase in occupational value during the intervention turned out to be the strongest factor for explaining children's BMI change. The variables for change in concrete, symbolic and self-reward values were based on the participants' median differences in sum of scores. Both in Paper III and IV, it was also the mothers who significantly increased their sum scores in occupational vale. It was however, the fathers' occupational value increase that was a strong predictor for children's BMI change. It has been suggested that perceived occupational value is associated with subjective health and well-being (Eklund et al., 2003; Eklund & Leufstadius, 2007). In this study these phenomena seemed linked since parents' subjective health was a strong predictor for children's decrease in BMI, as well.

The ability to increase perceived occupational values and have a high sense of subjective health is a finding which supports the ValMO-model assumption that perceiving occupational value is important for the sense of meaning in daily life and health (Erlandsson et al., 2011). It can be interpreted as parents who estimated that they had a good health and feeling in control in daily life also had resources to contribute to their children's decrease in BMI scores. This is coherent with the family systems theory emphasising that each family member shapes and is being shaped by other family members' behaviour. For instance, if fathers perceive more joy and connection to their family by spending more time with them, they are also more likely to have the ability to shape the children's behaviours on a daily basis.

It was also shown that fathers' education level had an impact on children's BMI change. The parents that participated in the study had slightly higher education than the parents who decided not to participate and also parents in general. The population of the studied area had a high educational level: 50 % have at least three years of higher education (college/university), compared to the national average 24% (Statistics Sweden, 2012). This indicates that fathers' with college or university education had an impact on children's BMI change.

Thus it seems relevant to assume that fathers' involvement in co-occupations with children in daily routines is associated with an occupational value spiral, starting from experiencing more value e.g. symbolic values (Paper III) and in turn impacting on an overall sense of meaning leading to the enhance change. The findings also demonstrated how fathers increased their time use together with children especially on preparing and having meals. The fathers increased their amount of time spent with children at weekdays from 83 minutes to 116 minutes for a typical weekday. During the period between 7-9 months the fathers spent 156 minutes (mean) a typical weekday with their children. The time was most spent in preparing and having meals (72 minutes). This is in line with the fathers' change in occupational value in which fathers increased their perception of symbolic value during the same time period. Thus, the fathers experienced increased occupational value may be derived from spending time with their children and probably to a high extent in involving the children in cooking occupations.

Most intervention has until now, included only mothers since the mother has traditionally spent more time interacting with the children. Previous research shows however, that involving fathers in parent-centred intervention is of value (Collins et al.,

2011) since, amongst other things, eating disorders in mothers have been associated with eating problems for their children (Elfhag et al., 2010).

Present meta-analysis suggests that including both parents in weight-loss intervention enhances outcomes, however, it does not provide insights into which aspects are most important to consider and what specifically contributed to the effectiveness (Young, Northern, Lister, Drummond, & O'Brien, 2007). This thesis further supports the importance to involving fathers in interventions, since fathers involvement seems to be curucial for change to occur.

In addition the findings shows several predictors involving parental characteristics such as sense of control, perception of occupational value and satisfaction with everyday activities. Factors such as finances, education and BMI also predicted opportunities for a change in time use. In addition mothers who reported high self-mastery was a predictor for the children's decrease in BMI. This can be interpreted as mothers who have mainly stable personal resources are more able to contribute to children's weight loss. Mastery refers to the degree to which people perceive that they are able to control factors that influence their life situation. High mastery may indicate a perception of self as capable of shaping motives, behaviour and future possibilities (Eklund et al., 2012).

These are aspects that might be important to consider in future interventions with the aim of enabling parents in promoting a healthy lifestyle in the family.

Methodological considerations

Trustworthiness

The trustworthiness in the papers applying a qualitative design (Paper I and II) will be discussed in terms of credibility, dependability, confirmability and transferability (Guba, 1981).

According to Creswell (2009), it is advisable to ensure *credibility* by departing from different perspectives and looking for agreement based on independent interpretation of the data. The interviewer's pre-understanding can be seen as a potential both when using probing questions during the interview and when analysing the data. Without the authors pre-understanding, and an occupational perspective of health, it may not be possible to grasp the phenomenon highlighted in this thesis. The pre-understanding can, however, also be seen as a threat and may influence the interpretation of data in the qualitative studies. In order to strengthen the trustworthiness, several authors were involved in the process of analysis in Paper I and II and continuous discussions between the authors regarding the categories and subcategories were conducted. Further, quotes from the informants were presented in the results in order to enhance trustworthiness of the study (Paper I) Steps have thus been taken to ensure the interpretation of data and findings.

Another aspect of credibility when conducting qualitative studies concerns the quality of data and whether data contains enough variation (Graneheim & Lundman,

2004). The results in Paper I are based on two women only, and there is a risk that the homogeneity limits the data collected. The sample was, however, selected with the aim to capture highly complex patterns of daily occupations and to investigate the usefulness of the methodology used in the thesis. Also in Paper II there is a risk that the informants, parents of children with obesity who are from a specific geographic region, constituted a fairly limited sample which might reduce the variation in the data collected. The analysis was based on all available participants (couples) randomised to the LiLi programme at the time for analysis, and there is no reason to believe that the remaining participants, if included, would have changed the findings. Another limitation concerning variation in both Paper I and II is that the participants were mainly born in Sweden, thus not taking cultural differences of the phenomenon under study into account. They, however, represented different socioeconomic groups in terms of education and economy which can be seen as a strength.

The credibility, i.e. if the results are credible and believable, can also be judged from the perspective of the participants. Concerning the time use diaries (Paper I and II) credibility was strengthened by member checks of the transformed diaries into graphs. All informants were asked to confirm and review their graphs, before the interview (Paper I) and in Paper II all participants confirmed their graphs by reading through the graph while considering the accuracy of the coding.

Similar triangulation (using multiple methods) and participants' checks of the collected time use data were used to establishing credibility in Paper III and IV. This approach involved taking the transformed graphs from all written time use diaries back to the participants so that they could view their graphs and judge the accuracy and credibility of the interpretations

Another aspect of trustworthiness is *dependability*, i.e. whether the researcher accounts for the ever-changing context within which the research occurs. The interviews and the analysis were conducted close in time to each other which limited the impact of unknown potential biases, such as discontinuity in the data collected and reinforced the dependability.

In Paper II the qualitative analyses were conducted by the first author and the co-authors followed by quantitative analyses performed in order to detect quantitative differences as well in the interpretation of the findings (Creswell, 2009). To enhance credibility and dependability the procedure of the sequential exploratory strategies were described in detail e.g. the data collection, the analysis of the data and the findings, and the study could potentially be repeated.

Confirmability refers to the degree to which the results could be confirmed or corroborated by others. As in accordance with Guba (1981), confirmability was established by a chronologically described process. In Paper I the data collection procedure and the coding system used in the analysis is presented in detail. In Paper II the data analysis was conducted in six steps in order to identify different characteristics. A potential shortcoming may be that the analyses were performed during a single 24-hour period (Paper II).

Transferability of the findings i.e. its applicability to other contexts, must be seen as limited to similar contexts and cultures. The transferability should, however, be judged

by others and it is therefore important to thoroughly describe the context of the study as well as the participants. One aspect that might limit the transferability of the results in this thesis is that the representation of people born outside Sweden was very low, thus not mirroring the population of families with obese children. As there is a risk that patterns of daily occupation and parents' involvement is culturally dependent, the transferability of the results also in a Swedish context might be limited. The transferability of the findings should also be seen as limited to families with children in similar age, as patterns of daily occupation in families with adolescents who are overweight, for example, might differ.

Validity of data and statistical procedures

How well specific research questions are answered depends on the validity of results. Validity depends on its property of inference (knowledge claim) and not only the design and methods used. It is the circumstances that contribute to a more or less valid interference and no method or design guarantees the validity of an inference (Shadish, Cook, & Campbell, 2002). The potential threats to the results and conclusions in this thesis will be discussed in terms of statistical conclusion validity, internal validity, reliability and external validity.

Statistical conclusion validity stresses the validity and strength of the correlation between intervention and outcome. Potential threats to statistical conclusion validity include low statistical power, unreliability of measures, restrictions of range and unreliability of the intervention implementation. The most commonly used way of addressing whether cause and effect co-vary is null hypothesis significance testing, e.g. the null hypothesis being that the difference between the population means from which the sample was drawn is zero (Shadish et al., 2002), if not showing a statistically significant $p<.05$ the cause and effect do not co-vary. Many researchers prefer reporting results as effect size estimates accompanied by 95% confidence intervals, which is feasible for comparison between e.g. treatment group versus control. In this thesis no comparison between treatment groups was conducted. In Paper III the 95 % confidence interval for parents' average time use difference and the most often not significant p-values are presented in order to show the complete result.

The linear regression analyses of parents time use revealed a relationship among the variables, although, it may not imply that the relationships are causal. The R in the regression shows an overall relationship between the independent and the dependent variable, a range between 0.60-0.80 indicate a strong relationship and above 0.80 is considered very strong (Tabachnick & Fidell, 2007). The parents' time use change in the togetherness focused and the child focused families, however, indicated a very strong relationship between the independent variable and the dependent variable.

In Paper IV the 95% confidence interval for standardised coefficient values (Beta) was used in order to present the strongest unique contribution for explaining the dependent variable. The regression for preparing and having meals (PM) showed p-values

greater than .05 and we thus concluded that the independent variables did not make a significant unique contribution to the prediction of the dependent variable. The adjusted R^2 for model was used since the sample size was small, the adjusted R^2 statistic "corrects" this value to provide a better estimate of the true population value (Pallant, 2010). The small sample size of 40 participants and the wide confidence intervals can be considered as threats to statistical conclusion validity and may incorrectly conclude that cause and effect do not co-vary. The results therefore has to be interpreted with caution. In order to conduct a reliable multiple regression equation it is import to consider the number of cases required; it is recommended to include more participants per predictor than was possible in Paper IV (Pallant, 2010). The analyses conducted in order to identify parental predictors of change in children's BMI z-scores especially may not be considered valid. This was the reason for choosing a standard multiple regression where all independent variables were entered into the equation simultaneously in order to determine which variable in a set of variables was the best predictor of the outcome. Preliminary analyses were conducted to ensure no violation of the assumption of normality, outliers, linearity and multicollinearity (when the independent variables are highly correlated) (Pallant, 2010).

Statistical power refers to the ability of a test to detect true relationships in the population, estimated from the included sample. The statistical power analyses were based on power calculations according to Altman (1993) suggesting that parents to 40 children with obesity would be sufficient to allocate to each intervention arm to detect a relevant difference in BMI of the children before and after the intervention. With a group size of 40 children per group a loss of 25% were considered to be tolerated. For comparisons between two groups, parents of 25 children were needed per group to have 80% chance with a two-sided significant level alpha = 0.05 to detect a difference of 0.8 SD between groups. With a 95% confidence interval it can be assumed that the true value is included except for in 5 % of the times (Shadish et al., 2002). When a study has low power the estimation of effect size will have a wider confidence interval, it will then be less precise of the true value in the population and the risk for errors increases (Shadish et al., 2002).

However, a group size of 40 parents of 22 children is a small sample and the results should be treated with cautions. The statistical power may be too low to detect an effect, since if the power is low the risk for Type II error increases. Type II error is the risk of accepting the null hypothesis when the hypothesis is actually true (Shadish et al., 2002) Even though power calculations were performed prior to the start of the randomised controlled trial (LOOPS) the defined effect size 0.8 SD to detect a relevant difference in children's BMI might not be a likely effect to expect in the current sample.

Furthermore the experimental design of this thesis did not include any comparisons between the randomized groups, and there was no intention to make that kind of comparisons at this time. It was not intended to draw any conclusions about and evaluate the different intervention strategies employed in the LOOPS. Such studies will be conducted in the future.

Reliability

Reliability refers to the extent a measure assess the characteristics of interest and an unreliable measure is an additional threat to statistical conclusion validity.

Parental time use was assessed using time-geographical diaries. The usefulness of the method has been tested in previous studies with an aim to facilitate reflections (Liedberg et al., 2004) although it has not been psychometrically evaluated when collecting data from the same participants over time. A pilot study was performed initially where two fathers of two children with obesity wrote time use diaries at four 24-hour periods. The diaries were coded and converted into graphs, and additional interviews were conducted in order to determine the reliability of the data. To ensure the validity of the data, the participants rated on a five-point scale (median 4.7) (graded form 5= very well to 1= not at all) how well the reported day represented an average day in their current life. No adjustment of this procedure was needed and the same method was used in the intervention. Temporal aspects of women's patterns of daily occupations has been detected in previous studies with time-geographical diaries and, has proven to be reliable (Erlandsson et al., 2004).

The shared patterns of daily occupation were analysed from a one day perspective in Paper II. In Paper III and IV the same coding system was used as in Paper II, and similar patterns of couples' shared daily occupations were found. If the analysis in Paper II were to be performed from several diary entries from each participant it may have strengthened the reliability of the result. However, it was considered important to collect the first diary (Monday-Thursday) in order to catch a one day perspective that was not influenced from the intervention. Thus, time-geographical diaries seemed to be a reliable instrument in order to assess individuals' occupational performance at daily basis.

In addition other self-reported instruments were used such as the OVal-pd, Mastery-S and single questions for estimations of subjective health and satisfaction with everyday life. The reliability scores for OVal-pd used in the sample (Paper III and IV) showed acceptable internal consistency with a Cronbach's alpha .80 and .90 respectively. The Mastery scale is frequently used and the concept of self-mastery is well established. The participants' rated their self-mastery in line with results from other studies involving parents of preschoolers (Erlandsson, 2003). The single questions used to estimate subjective health and satisfaction with everyday life were constructed for the LOOPS study and has not been psychometrically tested. An overall estimation of subjective health is a common health outcome question obtained by two single questions from the SF-36 questionnaire (Ware, 2000). These items have been shown to be useful for measuring self-rated subjective health (Ware & Sherbourne, 1992). The variable used in Paper IV in order to assess subjective health was a modified question, adapted from the SF-36 questionnaire. The single question in order to assess a self-rated financial situation was chosen since financial situation has previously (and still) been shown to be an important factor in relation to child obesity (Magnusson, Hulthén, & Kjellgren, 2005; Magnusson et al., 2011).

Attrition

If random sampling simplifies both internal and external validity inference, it may however, be a threat to attrition. The parents of 40 children were allocated to the LiLi intervention. Parents of 11 children decided not to participate at all and parents of 7 children decided not to keep time use diaries. All parents who decided to participate in the intervention followed through, although, not all of them participated in all sessions. Most parents attended 8 sessions (mean) and there were no differences between mothers and fathers regarding attendance. Analyses were conducted to identify different patterns of attrition. Parents who decided not to participate in the LiLi intervention had a statistically significant lower level of education than those parents who attended. The analyses revealed no statistically significant differences regarding parents' age, BMI, marital and employment status, number of children, child gender or child BMI at inclusion. However, fathers who decided not to participate and did not write diaries had a mean BMI value at 30 or above (obesity). It can be assumed that not all parents benefit from group intervention, since many had difficulties to attend. Thus, the intervention most certainly involved parents who had the strengths and resources it takes to plan ahead and travel to the sessions at a specific date and time. To conclude we reached a group of parents who had slightly above average education and with an ambition to change their lifestyle in favour of their children.

Threats to internal validity and external validity

Internal validity

The intervention was conducted by two certified occupational therapists (group leaders) who collaborated through all group meetings and data collection (Paper III and IV) during the one year intervention. The author of this thesis was one of the group leaders and responsible for the intervention and the collected data. This design is both a strength and a limitation to the study. The limitation could be a potential influence and a bias in the data analysis. Further, a potential threat to internal validity is present since participants were aware that they were being studied. These threats are nevertheless part of the intervention and the potential influence cannot be separated within the construct. The strength to internal validity is that the intervention was conducted by the two group leaders who strictly followed a manual, which insured that all participants were given the same components in the intervention. However, to what extent the strategies and different themes applied were discussed and implemented during the sessions depended on the participants own willingness to participate. The main paradigms of underlying theories and hypotheses (described in the introduction) were the base of the conducted intervention in which parents' patterns of daily occupations were studied. The participants' who entered and followed through with this intervention was the study sample, and analyses showed that they were a representative sample. Still there were a great number of individuals who did not participate in the intervention who ex-

perienced the initial problem; having young children with obesity. Unfortunately, there will continue to be individuals with similar circumstances that we did not manage to reach. This makes the clinical relevance limited.

External validity

External validity concerns the validity of interference about whether the cause-effect relationship holds as a generalisation to other groups. As discussed in the internal validity section, the participants who followed through the intervention were representative, however, 27% did not participate at all. Individuals with similar characteristics as the ones who decided not to participate will still be present at the child health care clinics. This is important to consider since all children with obesity have the right to receive effective and evidence based treatment. Threats to external validity include the interaction of cause-effect relationship, over treatment variations, with settings and outcomes (Altman, 1993; Shadish et al., 2002). How representative were the participants randomised to the intervention as well as how the intervention was conducted must be accentuated to be able to answer the causal relationship. Interaction of causal relationships with outcomes, concerns to what extent it is possible to determine the interventions impact on parents' opportunities to change. The purposive sampling in Papers II-IV was important for the internal validity, although, its value for exploring the generalisability of the effect in other setting is not yet confirmed. The small sample size, as mentioned above, was also a threat to external validity. The research was carried out in an area where the educational level is general high and where parents are born mainly in Scandinavian countries. The participants in Papers I-IV came to represent different socioeconomic groups, but with mainly parents of preschool children born in Sweden. This means that the result may be generalised to a similar context, although, it should be treated with caution in diverse societies and cultures. The explorative design in this thesis enabled both researchers and the participants to become aware of patterns of daily occupations and their impact on children's opportunities to decrease their BMI. The methodology used may certainly be useful in clinical settings. However, further research is needed to strengthen the evidence base for intervention programmes in the future. This research may be seen as one piece of the puzzle with an aim of developing strategies to prevent the long-term negative effects of childhood obesity.

Conclusions and clinical implications

This thesis may contribute to an increased knowledge about the usefulness in using a time-geographical diary method to facilitate reflection. It also contributes to knowledge and understanding of patterns in daily occupations in general and specifically among parents of children with obesity. This exploration of opportunities for change in parents' time use and children's BMI, and of factors related to such change, highlights im-

portant knowledge for further development of family interventions aimed to support a healthy lifestyle. The main findings of this thesis are as follows:

- The use of a time-geographical diary converted into a graph, illustrating the sequences of the patterns in the diarists' daily occupations was the main facilitator of reflection.
- Daily occupations were shown to be in a constant state of change and intertwined with those of other family members' patterns of occupation.
- Four main groups of family types have been identified and parents in these families were shown to have differing opportunities to change their time spent together with their children.
- Parents who shared childcare and household work were more likely to increase their time spent on e.g. physically active occupations.
- Parents who divided the childcare and household work almost equally in the beginning of the intervention were able to change their time use to include even more time spent with the children, in preparing and having meals on weekdays and participating in physically active occupations on the weekends, and the children's BMI decreased subsequently.
- Factors associated with the parents' time use change were; adequate finances, "low" self-mastery at inclusion, satisfaction with everyday activities and "low" parental BMI.
- An increased perception of occupational values in the fathers, high self-mastery at inclusion of the mothers, the high self-rated subjective health of the parents and the fathers having a university education were all predictors of the children's decrease in BMI.
- The involvement of the father seems to be important for change to occur, both in the amount of time spent with children and change in children's weight status. Fathers who were more present and involved in their children's daily life appear to support a healthier lifestyle.
- The number of diaries written during the LiLi programme, were shown to predict increased time spent in physically active occupations. It was sufficient to write 4-6 diaries in order to predict associations with an increase in time use.
- The amount of time that parents spent with their children during weekdays and their perceived occupational value seem to be related. The parents' increased perception of value in daily occupations was shown to increase and predicted an increase in physical active occupations as well as a decrease in the children's BMI.

These findings provide incitements for clinical implications:

The time-geographical diary method enables the informants to reflect and become aware of changes that are relevant to explaining the causes for engaging in occupations the way they do.

- Time-geographical diaries may be useful in research and in clinical practice to lend support to individuals who need to establish a healthier lifestyle.
- Using an occupational perspective to facilitate awareness of what is important and meaningful to the individual in daily life may contribute to change.
- Collaboration with parents following an occupation-focused approach may be important in interventions aimed at facilitating normal weight development in children
- In such collaborations/interventions, it must be borne in mind that individuals have different resources and capacities to use. Parental resources should be identified and strengthened.
- The importance of collaborating with both parents should be emphasised.
- To address concerns of obesity through an occupation-focused approach, not only facilitate weight loss, but also enable a lifestyle change in order to maintain long-term wellness may be effective.

However, there is a need for further research and development to understand the relationships between individual patterns of daily occupations and health.

Future studies should:

- Consider, in more detail, exploring the process of change during the LiLi intervention. The most important factors related to a sustainable lifestyle change are still unknown. An occupation-focused approach together with learning and motivation theories should be implemented in such analyses.
- Explore patterns of daily occupations in relation to the needs of different family types e.g. in different populations and cultures.
- Investigate the relationship between occupational value, sense of control and its impact on time use change and children's decrease in BMI should be further investigated.
- Consider in more detail the parental experiences of value in daily occupations and their relation to family health.
- Confirm the findings of children spending more time together with their parents through larger samples and a longitudinal evaluation of the impact on children's weight.
- Explore the amount and types of physically active occupations that are optimal for the health of young children.

Svensk sammanfattning/ Swedish summary

Vardagen pågår ständigt och den innehåller olika upplevelser för alla människor, unga som gamla. Att kunna vara aktiv utifrån egna önskemål och möjligheter är centralt i människors liv. Inom arbetsterapi finns ett starkt grundantagande om att det för individen måste finnas en rimlig balans mellan olika sysslor i det dagliga aktivitetsmönstret som kan ge både psykisk och fysisk stimulans och i sin tur bidra till goda hälsoeffekter. Det är visat i flera studier att om vardagens aktiviteter upplevs som meningsfulla och om det finns en balans mellan nödvändiga och andra mer stimulerande aktiviteter, kan det bidra till ett bättre välbefinnande. Förutom att kunna göra det man önskar så måste det också finnas tid för detta. Att ens val av aktiviteter ryms i den tid som är tillgänglig och att uppleva att man har en rimlig kontroll över tiden har visat sig vara betydelsefullt. Engagemang i aktivitet sker ofta tillsammans med andra och i en familj utgör hemmet en central punkt för social gemenskap. Detta är samtidigt en utmaning eftersom familjemedlemmars olika behov och önskemål av aktiviteter konkurrerar om den tid som finns tillgänglig.

Den här avhandlingen tillämpar ett barn- och familjeperspektiv för att förstå och beskriva de aktivitetsutmaningar som många familjer står inför idag och som kan utgöra en risk för ohälsa. En grupp särskilt utsatta är barn med kraftig övervikt redan i förskoleåldern vars aktivitetsutförande och aktivitetsmönster kan innebära en risk för utvecklande av ohälsa. Förekomsten av fetma bland barn har ökat i Sverige under de senaste 25 åren. Orsakerna till att fetma utvecklas anses vara en kombination av livsstil, miljöfaktorer och arv. Finns ärftligheten är risken stor att fetma utvecklas om barnet dessutom har en livsstil som främjar övervikt i en miljö som inte stimulerar till aktivitet eller t.o.m. hindrar barnet att vara aktiv.

Övervikt och fetma under barndomen har visat sig ha ett starkt samband med fetma och livsstilsrelaterade sjukdomar i vuxen ålder. Förutom en ökad risk för ohälsa kan fetma också ge svåra sociala konsekvenser för barn och ungdomar. Exempel på dessa kan vara mobbning, minskad delaktighet i fritidsaktiviteter och andra sociala sammanhang. Flertalet studier pekar på att vardagsrutiner ser annorlunda ut hos familjer med överviktiga barn. Måltidsrutiner, familjesamvaro och daglig fysiskaktivitet har visat sig vara avgörande. Att utveckla goda vanor för lek och rörelse redan i förskoleåldern har också visat sig vara betydelsefullt för de val av aktiviteter man gör senare i livet. Enligt

Statens Beredning för medicinsk Utvärdering (SBU) är därför behovet av att utveckla och utvärdera nya strategier för att nå ut med kunskaper om fetmans orsaker och risker angeläget. Strategier för att förebygga utveckling av fetma hos barn ter sig därför vara angeläget.

För många handlar livsstil inte bara om val utan det präglas av de handlingsmönster man hamnat i beroende på olika vanor och förutsättningar. Olika socioekonomiska förhållanden, miljöfaktorer och etnicitet är exempel på några av flera faktorer som påverkar hur aktiviteter i vardagen fördelar sig inom olika mönster. Människors möjligheter att påverka vardagen begränsas av olika ramar och restriktioner (förmåga, tillgångar, arbetstider, barnomsorg, socialt kontaktnät osv.). Personliga önskemål, ambitioner och ansträngningar påverkas av de restriktioner som naturen och samhället ställer. Detta innebär att livets skeende äger rum inom vissa mönster som inte alltid är hälsofrämjande för individen. Det finns behov av utökad kunskap om vardagen och hur olika aktivitetsmönster påverkar människors hälsa.

Vardagen kan studeras och tolkas från många olika perspektiv och flera olika metoder finns att tillgå. Det saknas dock kunskap om hur aktivitetsmönster ser ut för föräldrar till förskolebarn med fetma och vilka möjligheter och hinder det finns för att förändra ett icke önskvärt mönster i vardagen. En ökad förståelse för föräldrars prioriteringar och upplevelser i vardagen samt föräldrars aktivitetsmönster i förhållande till barnen är troligtvis en viktig faktor för att kunna utveckla redan känd kunskap om hur livsstilsförändrings strategier bäst utformas. Kunskap om vardagens betydelse för varaktiga livsstilsförändringar är också betydelsefullt för vidare utveckling av prevention och behandling av andra livsstilsrelaterade sjukdomar i samhället. Hittills har inga studier fångat en hel familjs sammantagna aktivitetsmönster för att se hur dessa samverkar i en förändringsprocess mot en reviderad livsstil.

Syfte

Syftet med avhandlingen var att med en utgångspunkt i en aktivitetsbaserad intervention speciellt utformad för föräldrar till barn som har utvecklat fetma i förskoleåldern, studera föräldrars aktivitetsmönster. Dessutom undersöktes upplevelser i dessa mönster samt förståelse för fenomen som kan hindra eller främja förändring av föräldrars aktivitetsmönster och livsstil till förmån för viktnormalisering hos barnet. Den första delstudien var av metodologisk karaktär vilken syftade till att undersöka användbarheten av tidsgeografisk metod för att synliggöra och reflektera över förändringar i aktivitetsmönster. I delstudie II, var syftet att identifiera sammanboende föräldrars integrerade aktivitetsmönster. Delstudie III bestod av en explorativ studie i syfte att upptäcka förändring i föräldrars aktivitetsmönster tillsammans med sina barn samt föräldrarnas upplevda aktivitetsvärde före och efter en intervention. Dessutom var syftet att undersöka skillnader mellan olika familjetyper och förändring i barnens BMI. Faktorer relaterade till föräldrars möjlighet att ändra sitt aktivitetsmönster samt faktorer som visade sig ha betydelse för förändring av barnens BMI, identifierades i delstudie IV.

Design

Ett gruppbehandlingsprogram baserat på programmet Vardagsrevidering och tidigare forskning kring samband mellan vardagens aktivitetsmönster och hälsa konstruerades som en kurs kallad ”Lättare Vardag”. Kursen riktade sig till föräldrar med barn i förskoleåldern som utvecklat fetma. Lättare Vardag ingick i en randomiserad kontrollerad studie; ”Familjebaserad intervention till familjer, där barn är i riskzonen för övervikt och fetma” (LOOPS). Föräldrar som randomiserats till Lättare Vardag bjöds in till att delta vid 13 grupptillfällen under ett år. Målsättningen med kursen var att med ett familjeperspektiv stödja föräldrarna att fokusera vardagens hela aktivitetsrepertoar och dess betydelse för hälsa och välbefinnande för hela familjen.

Metod, urval och resultat i avhandlingens fyra delstudier

I hela avhandlingen utgör Tidsgeografin och dess centrala begrepp en metodologisk utgångspunkt. Den tidsgeografiska tankestrukturen stöds av en visualiseringsteknik som kan liknas vid en karta. Allt man gör under dygnets 24 timmar kan synliggöras på en karta (här kallad graf). Tidsgeografiska dagböcker användes vid samtliga delstudier. Metoden har bland annat tidigare använts inom arbetsterapi för att studera vardagens betydelse för upplevda stressmoment i relation till hälsa och visat sig vara användbar för att studera enskilda individers aktivitetsmönster. Metodologi för att studera och värdera en hel familjs aktivitetsmönster var fortfarande mycket begränsad. En central metodologisk fråga var i denna avhandling att ta reda på om de tidsgeografiska dagböckerna kunde utgöra en förutsättning för reflektion för att medvetandegöra vilka val och möjligheter som fanns tillgängliga under 24 timmar. Två sammanboende, förvärvsarbetande kvinnor med barn i förskoleåldern deltog i delstudie I. Tidsgeografiska dagböcker skrevs under 24 timmar vid två tillfällen med 10 veckors mellanrum. En intervju utfördes i syfte att stimulera informanterna till att reflektera över det egna görandet och dess förändring över tid. Dagböcker, grafer och intervjuer analyserades med hjälp av en kvalitativ innehållsanalys. Resultatet visade att metoden hjälpte kvinnorna att reflektera över sina vanor och rutiner som de inte tidigare varit medvetna om. Graferna som var konstruerade utifrån dagböckerna utgjorde ett underlag till att systematiskt beskriva kvinnornas vardag vilket även skapade förutsättningar för reflektion.

I delstudie II, deltog 15 föräldrapar till barn i förskoleåldern med fetma. Varje förälder skrev en tidsgeografisk dagbok under 24 timmar. Dagböckerna analyserades först med hjälp av en kvalitativ innehållsanalys i syfte att ta reda på och beskriva vilka aktiviteter föräldrarna var engagerade i. Vidare utfördes en kvantitativ innehållsanalys för att ta reda på hur mycket tid föräldrarna spenderade i olika aktiviteter. Varje förälders mönster analyserades först individuellt sedan i förhållande till sin partner. Resultatet visade att det fanns stora skillnader mellan hur män och kvinnor fördelade sin tid och det fanns även skillnader mellan olika föräldrapar. Fyra olika familjetyper identifierades utifrån hur föräldrarna spenderade sin tid i olika vardagliga aktivitetsområden. Familjetypernas aktivitetsmönster skiljde sig signifikant åt i förhållande till hur mycket tid föräldrarna spenderade tillsammans med sina barn, tillsammans med varandra, i hushållsarbete,

förvärvsarbete, rekreation och i sömn. I ”tillsammans familje-typen” hade föräldrarna ett samordnat aktivitetsmönster, de delade lika i ansvar för vardagsrutiner och samvaro med barnen. I ”barn fokus familje-typen” spenderade båda föräldrarna tid med barnen, medan mammorna utförde största delen av hushållsarbetet. Föräldrarnas aktivitetsmönster var sällan samordnat. I ”individuella familje-typen” spenderade mammorna tid med barnen och minimal tid i hushållsarbete. Papporna medverkade sällan i familjesamvaro. I ”föräldra-barn familje-typen” tog mammorna det störst ansvaret för barnen och hushållsarbetet. Papporna i dessa familjer deltog i samvaro med barnen vid måltid och läggdags.

I delstudie III, inkluderades 30 föräldrar som deltagit i kursen Lättare Vardag med syfte att långsiktigt omstrukturera sina vardagsaktiviteter till förmån för familjens hälsa. Föräldrarnas möjlighet att förändra sin tid tillsammans med sina barn undersöktes. Dessutom undersöktes föräldrarnas förändring i upplevelser av värde i vardagliga aktiviteter. Analyser gjordes på totalt 182 dagböcker insamlade under 12 månader och på föräldrarnas självskattade upplevelse av aktivitetsvärden före och efter kursen. Resultatet visade att det var möjligt för de allra flesta föräldrarna att förändra sin tid tillsammans med sina barn framförallt under vardagarna. Den största skillnaden utgjorde pappornas förändring av tid tillsammans med barnen på vardagarna. Det visades också att förändring tar tid, för en del av deltagarna syntes förändringen först vid 7-9 månader efter kursens start. Även mammorna förändrade sin tid tillsammans med barnen, framförallt på helgerna och då i någon form av fysisk aktivitet.

Föräldrarna förändrade statistiskt signifikant hur de upplevde olika aktivitetsvärde. Mammornas upplevelser i självbelönande värden (aktiviteten i sig är belönande t.ex. att göra något som känns kul eller nyttigt) och pappornas symboliska värden (individuellt och indirekt värde t.ex. en känsla av tillhörighet) förändrades. Det fanns stora skillnader mellan hur föräldrarna fördelade i de fyra olika familjetyperna (identifierade i delstudie II) förändrade sin tid tillsammans med sina barn. Det visade sig att de föräldrapar som hjälptes åt med att samordna omvårdnad för barnen och hushållsarbete i högre grad kunde förändra sitt aktivitetsmönster till att spendera mer tid tillsammans med barnen än de föräldrapar som hade mer separata aktivitetsmönster. I de familjer där mammorna stod för den största delen av hemarbetet och kontakt med barnen var det svårare att förändra. Pappornas tid tillsammans med barnen och engagemang i familjen visade sig vara klart avgörande för hur det gick att förändra föräldrarnas aktivitetsmönster. Det visade sig även att barnens BMI sänktes mer i de familjer där båda föräldrarna spenderade mer tid tillsammans med sina barn.

I delstudie IV, inkluderades 40 föräldrar som deltagit i Lättare Vardag. Betydelsefulla faktorer för förändring av föräldrarnas aktivitetsmönster och barnens BMI, undersöktes. Resultatet visade att de faktorer som var statistiskt signifikant relaterade till föräldrars förändring i tid tillsammans med sina barn var god ekonomi, låg känsla av kontroll vid början av interventionen, adekvat tillfredställelse av vardagsaktiviteter samt föräldrar med lägre BMI. Antal skrivna dagböcker och förändring i aktivitetsvärde under interventionen förklarade förändring av tid i fysisk aktivitet. Vid analys av faktorer som påverkade barnens viktnedgång visade sig pappors förändring i aktivitetsvärden vara

den enskilt viktigaste faktorn, andra relaterade faktorer var mammor med hög känsla av kontroll, pappor med hög utbildning samt föräldrar som upplevde en god hälsa.

Kliniska implikationer

Resultatet från delstudier I-IV i denna avhandling leder till följande förslag på strategier som kan tillämpas av arbetsterapeuter samt andra yrkesverksamma som arbetar med hälsofrämjande insatser som involverar arbete mot förändring av livsstil generellt och mer specifikt för interventioner i syfte att normalisera vikt hos barn med fetma.

- Tidsgeografiska dagböcker har visat sig vara användbara för att stimulera till reflektion och synliggöra vardagliga aktivitetsmönster. För individer som står i begrepp att förändra sin livsstil kan dagboksmetoden vara effektiv.
- I syfte att tillvarata och stärka individers egna resurser och intresse för förändring, kan tidsgeografiska dagböcker konverterade till synliga aktivitetsmönster i form av en graf möjliggöra förändring. Det visade sig att 4-6 dagböcker var ett tillräckligt underlag för att skapa förändring.
- Att utgå från ett aktivitetsperspektiv vid en gruppbehandling visade sig vara värdefullt för att öka medvetenhet om samband mellan aktivitet och hälsa i syfte att möjliggöra förändring av aktivitetsmönster.
- Samarbete mellan och deltagande av båda föräldrarna har visat sig vara avgörande för att en förändring ska ske, både vad gäller förändring av aktivitetsmönster och barnens BMI.
- Det har visat sig vara värdefullt att flytta fokus från barnets vikt och istället koncentrera sig på vilka aktiviteter i vardagen som passar familjens möjligheter att göra förändringar i små steg.
- Eftersom förändring har visat sig ta tid, bör intervention erbjudas under längre perioder med regelbundna uppföljningar.
- Då faktorer som föräldrars upplevelse av värde och kontroll i relation till dagliga aktiviteter visat sig vara av betydelse både för förändring i tid tillsammans med sina barn samt barnens viktminskning bör dessa faktorer belysas vid fortsatt utveckling av effektiva familjeinterventioner.

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