Bed, Bath, and Beyond

Nature Interventions to Support Family Life in Dutch Women's Shelters and Shelters for Homeless Families.

Elise Peters

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General introduction

This dissertation is focused on families who reside in shelters. To give an idea of what family life in a shelter is like, this dissertation starts with a photo series. The photos show the daily lives of the Henderson family, a family of six who temporarily live in a shelter after becoming homeless. The photos are taken by social worker Sara Easter, who was able to capture the Henderson's family life from up-close. The photos and the captions provide an impression of the ups and downs and hassles and stressors of family life in a shelter.

Photos and texts are by Sara Easter (2017) (edited), reprinted here with permission.

Dallas and Jared Henderson, along with their children, are living in a homeless shelter in Fort Worth, Texas. The family of 6 lives in a space the size of an average bedroom. Because Jaret works nights, he needs to sleep some during the day. However, he tries to wake up in time to play and interact with the kids for a while before he leaves again.

"It's overwhelming and stressful," Dallas tells. "We are in a room and we don't have room for doing anything. We basically sit on the bed and watch movies, color, play cards. And there's a little playground outside we go to."


Ripley's
Believe It
or Not!

Jared stands in front of the T.V watching the news, while his 3-year-old son Zander watches from his bed behind him. Jared just woke from a nap (he tries to sleep when he can despite the crowded and noisy room) and is about to get ready to leave for his job working overnight as a janitor in a nearby factory.

Dallas and Jared steal a moment alone to discuss something with each other while the kids are occupied with a movie on T.V. The shelter has a rule that children must always be within direct reach of their parent when outside of the room. While this is important for safety on the shelter grounds, it makes it challenging for parents to get any time or space away from their kids, and for kids to get any time or space away from their parents.

Xoi (5) and Zander (3) look for shoes. The family's space is scattered with clothes, shoes, school supplies, and toys because their room is only equipped with two small drawers and one cabinet for storage. Dallas made some room by piling things on one of the children's bunk beds and having them sleep together on the other one.

The Hendersons eat dinner together. The shelter provides three meals a day and families with children are fed first. In order to get everyone that needs a meal in and out, the mealtimes for families are 5 a.m., 10:45 a.m., and 3:40 p.m. The Henderson parents try to keep a few snacks in their room so that the kids can eat something again before bedtime.

RATIONALE FOR THE CURRENT DISSERTATION

The photo series shows that family life can be under stress when families reside in a shelter. The Henderson family's small and shared room brings stressors such as a cluttered living space, and a lack of private space for one-on-one interactions or for individual activities. The common rooms that the Hendersons share with other families have general rules, for example for dinner time, that may not fit with the family's own schedules and routines. The lack of engaging play sites limits the children in their free exploration and puts extra stress on the Henderson parents to find ways to let their children play and be active, engaged, curious, and creative.

Life in a shelter can be stressful

The Henderson case is from the United States, but the stressors that the case uncovers are recognizable from international studies in shelters (Alleyne-Green et al., 2019). Parents have reported stress due to crowded, noisy, and chaotic living quarters (Azim et al., 2019; Pable, 2012; Sylvestre et al., 2018), living 'in the public eye' from a lack of privacy (Azim et al., 2019; Glumbíková et al., 2019), sharing space with other parents with differing parenting values (Holtrop et al., 2015), being limited in maintaining familiar routines (Alleyne-Green et al., 2019) and living by imposed rules and routines (Anthony et al., 2018; Glenn & Goodman, 2015; Mayberry et al., 2014). Parents have also expressed that shelters lack the design and comfort of a home (Walsh et al., 2010; Walsh et al., 2009) and that they miss safe and engaging play sites for children (Bradley et al., 2018; Walsh et al., 2010). When a place has so little functional and conceptual meaning for a family, it may be considered a 'placeless place' (Relph, 1976), with limited meaning in terms of dependence (feeling that the place offers opportunities to be who you want to be and to do what you need to do), stability (feeling comfort from the predictability of home), security (feeling safe and at ease at home), and belonging (feeling that one's identity and the identity of the place are connected). A placeless place may restrict families in developing a positive connection to their homes, and even cause home to be a stressor. When shelters function as an extra stressor to families, or even cause disruptions to the family's life and functioning, shelters cannot function as intended: as a safe haven from which families can rebuild their independent family life.

Aiming to improve the living circumstances for families in shelters

Dutch shelters organizations have expressed their worries on the potential negative impact of life in a shelter on families (Lubbers & Van Oostbrugge, 2019; Planije & Tuynman, 2015). As a response, the Dutch national federation of shelters have set norms to improve the quality of care in shelters (Lubbers & Van Oostenbrugge, 2019), with explicit consideration for the physical living spaces. The norms include facilities for play, exercise, relaxation, and spaces where families can be by themselves. A long-term ambition is to also facilitate larger and more private family apartments with a bathroom and kitchen for each family and separate bedrooms for the children. Such transition in shelter care would require changes to the built environment and more square meters per family. Unfortunately, specific plans for financing and building are not yet available to all locations. At the same time the demand for shelter care is growing and shelters are constantly working on their full capacity (Ministerie van Volksgezondheid Welzijn en Sport, 2019, 2020; Valente,

2020). This brings shelter practice in a difficult split of aiming to work towards higher standards for sheltering families, while being pressured to offer minimally viable sheltered living to as many families as possible, within physical living circumstances that do not yet meet shelters' own norms for quality.

Natural environments to improve the living circumstances

With the intention to improve the living circumstances of families in shelters, several shelter locations have joined in a project to implement natural environments in the shelter surroundings. The intention was to offer families opportunities for play and relaxation, and so help families to find ways to live well despite the stressors of sheltered living. Initially, four shelter locations started a pilot to explore the possible benefits of nature for families in shelters. After a positive evaluation, 21 shelter locations followed their example and implemented natural environments on their shelter property as well. Each location constructed a natural play area, a children's farm, a restorative garden, or a vegetable garden. Residing families and shelter professionals worked in co-construction with gardeners to design a natural environment that fitted with their needs and desires. Professionals were trained to use natural environments in their family supportive social work, utilizing both natural environments on property and in the vicinity of the shelter location.

The potential benefits of natural environments

Shelter organizations are not alone in their expectations that natural environments can offer opportunities for play and relaxation. In recent years there is a growing interest in the benefits of time spent in natural environments (Hartig et al., 2014; WHO, 2016; Frumkin et al., 2017; Dadvand et al., 2019). Experts in the field of environmental studies have described the links between contact with nature and mental and physical health (Markevych et al., 2017) and have provided conceptual frameworks that link exposure to biodiversity to mental and physical health benefits (Marselle et al., 2021). Nature is described as offering children and adults opportunities to restore their adaptive capabilities that have been diminished through the demands of everyday life (Hartig & Staats, 2004), for example through the renewal of psychological, physiological and cognitive resources (Berto, 2014; Marselle, 2019; Norwood et al., 2019; Tillmann et al., 2018; Vanaken & Danckaerts, 2018), and relational and social resources (Dankiw et al., 2020; Hartig, 2021; Putra et al., 2020). This is referred to as the restoring capacities of nature. Nature is also described as offering children and adults opportunities for building, deepening or strengthening their capacities for meeting the demands of everyday life, for example by providing opportunities for physical activity (Bikomeye et al., 2021; Bowler et al., 2010; Thompson Coon et al., 2011), social interaction (Ruijsbroek et al., 2017), and transcendent experiences such as wonder and reflection (Capaldi et al., 2015; Dallimer et al., 2012). For children specifically, nature is described as a setting with rich opportunities for play (Dankiw et al., 2020; Fyfe-Johnson et al., 2021; Lambert et al., 2019).

Theoretical explanations for the benefits of nature

Several theories have been formulated to explain why people experience nature as restorative and strengthening environment, and why children experience nature as an interesting play environment. Stress Reduction Theory (Ulrich et al., 1991) poses that engaging in a natural setting

immediately activates a positive emotional response in people, and lowers feelings of stress as well as stress indicators such as blood pressure and heart rate. The Biophilia Hypothesis explains the human response to nature by stating that people have an evolutionary learned preference for nature, especially when it offers features of prospect such as green pastures, open views, sounds of running water, and places of refuge (Barbiero & Berto, 2021; Wilson, 1984). People are drawn to these scenes and feel at ease, because human innate knowledge tells us we can be safe there, find food, and rest for a while. Attention Restoration Theory adds that simply being away from standard routines and thoughts and immersing oneself in nature as an interesting and enjoyable place allows us to recuperate after attention fatigue (Kaplan & Kaplan, 1989; S Kaplan, 1995). Features in nature such as sunlight on the water, the sound of waves, or views of birds are all interesting and offer fascination, but do not require directed attention which helps the mind to find rest. Apart from these 'features for attention restoration', Kuo (2015) distinguishes 20 more features of nature that provide humans with advantages, such as vitamin D and serotonin from sunlight, and helpful bacteria in our gut from playing in the soil.

Theories on the perceived and actual action possibilities of nature offer another explanation for the benefits of nature, especially related to the benefits for children's play. The Theory of Affordances (Gibson, 2014) explains how every physical setting has unique properties for every individual. A stone, for example, can have the affordance of being dig-up-able, collect-able, throw-able, stack-able, build-with-able, draw-with-able, etcetera, but only for a child with the mental and physical abilities to use it in that way. For babies, a stone will not have these affordances, but instead perhaps be feel-able and lick-able. When reviewing natural setting from the perspective of affordances for play, natural settings can be qualified as rich play settings. Firstly, natural settings provide children with loose parts such as sticks, stones, mud, pinecones, and straws that can be moved around, designed and redesigned and thus create much more opportunities for creative engagement than static environments (Nicholson, 1972). The fact that these loose parts have no fixed meaning gives children the opportunity to shape playing with these materials by themselves, from using a tree branch as a walking stick for playing grandpa in pretend play, to using it as a piece of wall for building a hut. By providing such diverse affordances for play, natural environments tend to offer a setting that fits with a child's play needs and desires (Spencer et al., 2019). Secondly, natural settings tend to allow children freedom in play behavior. A forest, for example, will afford children with opportunities for running as fast as they can, shouting loudly, digging in the sand, picking up sticks and breaking them into smaller pieces, collecting pinecones to bring home, and throwing stones into the water. Many built environments will not provide opportunities for children to run, shout, dig, break, collect and throw. People may consider this behavior bothersome because it does not follow the rules of social behavior for built environments and because the behavior will have negative consequences such as broken things and disturbed people. One might say that natural settings provide degrees of freedom for the child's play, which may explain why children play longer, more involved and more diverse in a natural setting (Dankiw et al., 2020; Kyttä, 2004; Luchs & Fikus, 2013; Van Oers, 2013).

Gaps in extant literature

When aiming to support families in shelters, it sounds promising to introduce nature in the care for families, but reviews uncover important gaps in current literature that make caution necessary. I will discuss several important gaps that call for research on the potential impact of nature interventions on family life in shelters.

Gap 1: Studies in care settings. Extant literature lacks focus on the benefits of nature interventions for people in specific care settings (Lackey et al., 2020; Twohig-Bennett & Jones, 2018). As the Henderson case in this dissertation's introduction may unveil, families in shelters have experiences that are quite unique to life in a shelter. To understand how natural environments may or may not contribute to these unique experiences in this specific context, studies in the context of shelters are needed.

Gap 2: Insight in applicability of common nature interventions to shelter contexts. Not all nature interventions that have been examined in extant literature may be readily applicable to the context of shelters. For example, for people who need protection, walks in a forest may not be possible. The impact of nature interventions may also be unique for the specific characteristics of shelter clients. For example, for clients who experience fear, being away from standard routines may not be stress reducing. It may be necessary to adapt nature interventions to make them applicable to the specific needs of shelter clients, which makes results from existing literature not generalizable to the context of shelters. Studies that use nature interventions that are well applicable in the context of shelters are needed.

Gap 3: The professional perspective. If shelter professionals are to incorporate nature interventions in their practice, we need studies that examine how professionals can incorporate nature interventions in their daily working practice with their clients, and how professionals evaluate the contribution of these interventions to their professional goals and aims. The review by Lackey et al. (2020) identifies a current lack of such practice based studies, and a need for studies that focus on professionals' use of nature interventions in their working practice.

Gap 4: Studies among diverse populations. Clients in shelters often come from marginalized groups with lack of sufficient income, low financial independency, lack of affordable housing, low educational level, problems in physical and mental health, and belonging to an ethnic minority (Jonker, 2016; Mago et al., 2013). Reviews have revealed that few studies focus on the impact of nature exposure on people from marginalized groups (Fyfe-Johnson et al., 2021; Van den Bosch & Sang, 2017), and that most research findings for adults have so far been based on white, college-educated participants with a high SES (Lackey et al., 2020; Twohig-Bennett & Jones, 2018). Current research findings on the impact of nature interventions do therefor not provide enough insights on the population of shelter clients. To understand the impact of nature interventions on shelter clients, studies are needed that are focused on the clients' experiences.

Gap 5: Insight in relevance and applicability of current theory to shelter contexts. Most studies on the impact of nature for people have focused on the effect of nature on individuals and not on families (Chawla, 2015), and theoretical frameworks on human-nature relations have thus far been focused on describing the benefits of interacting with nature from an individual medical or psychological perspective (Kaplan & Kaplan, 1989; Stephen Kaplan, 1995; Kuo, 2015; Ulrich et al., 1991; Wilson, 1984). It remains unclear if these perspectives are useful for the pedagogical context of child and family social work. Exploratory research, without an a priori theoretical view, is needed to help identify which theoretical perspectives are relevant for the context of child and family social work.

Gap 6: Controlled designs. The reviews by Lackey et al. (2020) and Van den Bosch and Sang (2017) uncovered that most of the quantitative evidence for the benefits of nature for mental wellbeing originates from cross-sectional surveys, reflecting a lack of controlled designs. Fyfe-Johnson et al. (2021) and Roberts et al. (2020) identified that most of the literature on the benefits of nature for children was based on qualitative and observational studies. Lackey et al. (2020), Tillmann et al. (2018), Bratman et al. (2019) and Capaldi et al. (2015) advise future research efforts to start employing more rigorous methods. Studies with experimental and quasi-experimental designs are needed to contribute to the need for more controlled designs.

Extra reason for caution for under-informed implementation. The setting of shelters may especially call for rigorous research before nature interventions are widely implemented, because spots in a shelter are scarce and the demand for shelter is high. This makes the opportunity costs of a natural environment high; the land that is required for a natural environment and the funding that is needed for the design and construction can also be utilized for simply more rooms and beds. Insights in the possible benefits of nature for families in a shelter is needed to help practice make well-informed decisions on optimal allocation of resources.

Necessity for the current dissertation

The identified gaps call for specific studies. To understand the possible benefits of nature for the context of shelters, there is a need for studies that are conducted in the context of shelters, using nature interventions that are applicable in that context, and evaluating the effects among actual clients. To identify if and how natural environments can contribute to the specific aims of social family work in shelters, studies are needed that are informed by the perspective of shelter professionals. Studies with professionals as participants are needed to uncover how professionals can incorporate natural environments in their working practice with their clients. Exploratory practice-based research can help identify which theoretical perspectives are relevant for the study of natural environments in shelters. These perspectives may guide experimental and quasi-experimental designs to put expectations regarding the benefits of natural environment in shelters to the test.

This dissertation contains of four studies in which nature interventions were used in the professional conduct of shelter professionals' family supportive work.

AIM OF THIS DISSERTATION

The aim of this dissertation is to explore the potential benefits of nature for families in women's shelters and shelters for homeless families, to test the impact of nature interventions on parental wellbeing of parents in shelters, and to describe social workers' decisions in choosing a nature intervention for the support of parents.

OVERVIEW OF STUDIES

Study 1: An Inductive Exploration

To know if nature can be used to improve shelter services, the insights of shelter professionals can be helpful. After all, shelter professionals are reflective professionals whose work it is to evaluate the impact of their professional actions based on signals from the family in relation to the goals they have with their shelter care work. In our inductive exploration, we used an action research design to explore professionals' perspective of the benefits of nature for family life in women's shelters.

In Study 1 four researchers and 46 shelter professionals collaborated for six months by forming a Community of Practice with the intention to develop their understanding of the benefits of nature. Thematic analyses of recordings of the CoP meetings revealed a mechanism of change: professionals suggested that nature supported parenting by providing feelings of relatedness between parents and child, parental feelings of competence, and autonomy in parenting. This mechanism of change formed the basis for the following two studies.

Study 2: A Quasi-Experiment

The inductive exploration suggested that experiencing nature may support parents in fulfilling their parental Basic Psychological Needs (Ryan & Deci, 2017) of relatedness between parents and child, parental feelings of competence, and autonomy in parenting. Basic psychological needs may be a relevant framework to further evaluate the possible benefits of nature for parents in shelters. As the Henderson case illustrates, conditions in shelters may limit the possibilities for need fulfillment for parents and may even actively frustrate parents in their attempts. Studies outside the context of shelters have indicated the importance of parental need fulfilment by showing that parents would be more prone to experience wellbeing and maintain autonomy-supportive parenting practices when experiencing need fulfilment (Brenning & Soenens, 2017; Brenning et al., 2017; Jungert et al., 2015; Mabbe et al., 2018; Slobodin et al., 2020; Van Der Kaap-Deeder et al., 2019; van der Kaap-Deeder et al., 2015). Parents are therefore advised to seek daily need fulfilling experiences (Brenning et al., 2017), but studies that report on types of activities parents can employ are currently scarce. It is of interest to test if activities in a natural environment can function as a need fulfilling experience for parents in shelters.

Study 2 is a quasi-experiment, designed to test if experiencing nature was associated with an improvement in need fulfilment. Need satisfaction and need frustration were measured among

parents in shelters (*N* = 160), with one measurement in the standard indoor context of the shelter and one measurement while experiencing nature. The associations between experiencing nature and parental need satisfaction and need frustration were analyzed using linear mixed model analyses.

Study 3: A Single Case Experiment

Exposure to nature may offer an avenue for supporting parents' functioning and resilience while living in shelters. To gain insight in the impact of exposure to nature, more controlled studies are needed. With the single case experiment, we aimed to test a proof of principle for the impact of nature exposure on parental wellbeing. Firstly, we aimed to determine whether a functional relationship can be observed between exposure to nature and basic psychological need fulfillment of parents. Secondly, we aimed to determine whether a functional relationship can be observed between exposure to nature and determinants of overall wellbeing of the parent, namely satisfaction with life and affective state.

Study 3 is a repeated (*N*=3) single case experiment, which involved repeated and randomized exposure to the indoor environment of the shelter (baseline phases) and exposure to a natural environment (intervention phases) while assessing basic psychological need fulfillment in parenting as well as affective state of the parent, and parents' satisfaction with life.

Study 4: A Case Narrative Study

Several homeless shelters and women's shelters have started to integrate nature in their parenting supportive social work (Lygum et al., 2019; Millican et al., 2019; Norton et al., 2020; E. Peters, J. Maas, D. Hovinga, et al., 2020; E. Peters, J. Maas, C Schuengel, et al., 2020; Renzetti et al., 2014; Varning Poulsen et al., 2020), such as by offering seasonal celebrations in nature, walk and talk therapy, outdoor adventure experiences, therapeutic horticulture, or outdoor play moments. Thus far, little is known about how professionals choose nature activities for the support of parents. If helping families to engage with nature is to be part of professional skills and training, description and understanding is needed of theories that professionals might implicitly or explicitly rely on, when determining whether a nature activity may be good for a family.

Study 4 was aimed to describe professional theories-in-use for facilitating nature activities among families in shelters. The study presents a Grounded Theory Analysis of 149 case narratives written by shelter professionals about parenting supportive nature activities that they designed for families under their care.

General discussion

The thesis ends with a general discussion in which I critically reflect on how this dissertation contributed to the understanding of the impact of nature interventions on family life in Dutch women's shelters and shelters for homeless families. To do so, the general discussion provides an overview of empirical findings, a critical reflection of the study's strengths and limitations,

recommendations for practice, a discussion of potential theoretical implications, and possible directions for future research.

CONTEXT SKETCH

The studies in this dissertation were conducted in Dutch shelters. Shelters provide temporary homes for people when they have no safe or suitable living place and are not capable of maintaining themselves in society on their own, with usual support, with informal care, or with help from their social network (*Wet Maatschappelijke Ondersteuning 2015*, 2021). Homeless shelters focus on people who have no suitable living place, for example due to home eviction after financial problems, and women's and men's shelters focus on people who have no safe living place, due to violence. People who need social support and housing primarily due to psychosocial and psychiatric problems are not housed in shelters but are offered assisted living.

Homeless shelters

Homeless shelters provide shelter to people who became houseless and homeless due to for example financial problems. The Dutch government has policy in place to prevent homelessness among families, with financial support to maintain a basic income (such as social security benefit and benefit for unemployed people), financial support for the cost of children (such as supplementary child benefit, childcare allowance, child related budget, and free education), social support to build stability for the future (such as support in finding a job and support in paying off debts), and local government loans to protect against home eviction (for example to pay off rent delays or to pay for a loan deposit). These policies do not prevent all cases of homelessness amongst families. The Netherlands authorities operate on the principle of Housing First (Advies Commissie Toekomst Beschermd Wonen, 2015; Valente, 2020; Van Rijn, 2015) and aim to provide direct permanent housing for homeless families. Reality is that transitional housing is necessary when a permanent home is not immediately available. In 2020, 1650 children and their families were housed in a shelter for homeless families (Valente, 2021). Local government is charged with sheltering homeless families (*Wet Maatschappelijke Ondersteuning 2015*, 2021). Shelters provide this transitional housing, support clients with practical hassles during their stay, and provide social work to transition to an independent life. Emergency shelters are directly available for homeless families in direct need of sheltering, whereafter families are placed in a family shelter. Families reside in a shelter for the time that is needed to find an affordable permanent home, and shelters hold themselves to a maximum of 18 months in total for this process.

Women's shelters

Women's shelters provide shelter to women and their children (if any) when they are victims of abuse. The Netherlands has general women's shelters that provide shelter to a diverse group of women that suffer from threat or abuse, and specialized shelters for teenaged mothers who are victim of abuse, victims of honor related threats, and victims of sex trafficking or other forms of human trafficking. Men's shelters are relatively new in the Netherlands and provide care for male victims of abuse and their children (if any). The studies in this dissertation were conducted in

women's shelters before men's shelters were widely adopted in the Netherlands. The women's shelters primarily cared for women and their children, and some shelters occasionally admitted men and their children as clients.

The term 'women's shelter' may cause some confusion, because it implies that the shelters only care for women. Some women's shelters indeed have a women-only approach, in which they only allow women in the shelter and prohibit the physical presence of men, including male children from a certain age. Nevertheless, most women's shelters in the Netherlands work with a family systems approach and actively engage male family members in their care, such as the woman's (ex) partner, her children, or the father of her children. Sometimes both partners in a violent relationship are admitted as clients with the intention to work system oriented. At the time the studies in this dissertation were conducted, male victims of abuse were also occasionally admitted as clients in a women's shelter. The fact that men can be clients in a women's shelter may cause some confusion about the term. It may seem simpler to use a gender-neutral term such as 'shelters for abused people' for all shelters that deal with abused clients, regardless of their gender. Yet reports on women's specialist support explicitly call for gender specific terms and gender specific treatment for women who are victims of abuse, to address the prevalence and patterns of gender related violence towards women (GREVIO, 2020; WAVE, 2019).

Women's shelters offer emergency beds for clients who need immediate shelter. Police, public prosecution, shelters, the national consultancy and contact point for domestic violence and child abuse, and municipal health services decide who has access to emergency beds. Emergency beds are offered for a maximum of three days, while shelters arrange a safe place for a longer stay. Crisis sheltering is offered for approximately 6 to 9 weeks, in which a risk assessment and a care plan is made. When safety cannot be guaranteed after the crisis intervention, a client's stay in the women's shelter is part of the care plan. The goal of shelter care is to work towards a safe and autonomous life for the woman and her family, which can be a return to their previous home or a move to a new place in a different region. Shelters offer a safe place to live, support clients with practical hassles during their stay, provide social work to transition to an independent life, and offer specific interventions about, for example, trauma rehabilitation, relationships, empowerment, and parenting.

Chapter 1.
An Inductive Exploration

Making women's shelters more conducive to family life: professionals' exploration of the benefits of nature

Published as

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The results of this study have been shared via

- Opening lecture at 'Huisje Boompje Beestje' Kick-Off Conference organized by Valente Branchevereniging voor Opvang en Stichting Kinderpostzegels on October 10th 2017.
- Presentation at Conference of the International Association for People-Environment Studies (IAPS) in Rome (IT) on July 10th 2018.
- Workshop at Conference 'Kind en Natuur' organized by IVN Natuureducatie on September 27th 2018.
- Book for practice professionals:

  Peters, E., Maas, J., Van 't Hoff, L., & Hovinga, D. (2021). De knotsgekke avonturen van mijn moeder en de geit: De waarde van natuur in de vrouwenopvang (Tweede druk ed.). Hogeschool Leiden. Book can be retrieved from https://www.hsleiden.nl/binaries/content/assets/hsl/lectoraten/natuur-en-ontwikkeling-kind/knotsgek-2021.pdf
- Factsheet, sent to all shelters that participated in the studies in this dissertation:

  Van den Bogerd, N., Peters, E., & Hovinga, D. (2021). Huisje Boompje Beestje: Hoe natuur de kwaliteit van de vrouwen- en maatschappelijke opvang voor kinderen kan versterken. Factsheet can be retrieved from: https://www.hsleiden.nl/binaries/content/assets/hsl/lectoraten/natuur-en-ontwikkeling-kind/factsheet-huisjeboompjebeestje.pdf

When families fall victim to human trafficking, forced prostitution, domestic violence, or honor threats, they may seek shelter in a women's shelter[1]. Women's shelters provide them with a temporary place to live and help with rebuilding their lives (WAVE, 2019). Although these families are protected against physical and emotional threats that they endured at home, various stressors to family life can be indicated. Having been exposed to violence creates physical, mental and social problems in both adults and children (Noble-Carr et al., 2020; Oram et al., 2012) and the prevalence of anxiety, depression and psychological trauma amongst women and children who live in shelters is high (Fernández-González et al., 2018; Helfrich et al., 2008; Ware et al., 2001). Experiences with violence can be disruptive to family life because it can limit parents in their wellbeing and parenting ability, and lead to behavioral difficulties in children (Peled & Dekel, 2010; Spiller et al., 2012; Van Ee et al., 2016).

These problems may be compounded by the corollaries of moving into a shelter. Families lose contact with school, work, and their social setting, and face uncertain prospects because the sheltered home is temporary. Living in a shelter requires families to adapt to shelter rules and routines, which are perceived to be impractical for family life (Glenn & Goodman, 2015) or even disempowering when they conflict with parents' own parenting style (Anthony et al., 2018). Women's shelters are often situated in densely built apartments that provide families with a confined space as their primary living context (Wolf et al., 2006), which women consider in need of improvement (Asmoredjo et al., 2017). The use of resources outside the shelter, such as visits to friends and family, playing in the neighborhood or going to a public park is limited because families may experience continuing threats from aggressors and because of the psychological and psychiatric problems that restrict the families' mobility. Family life in shelters presents, therefore, several challenges. An important question regards the ways in which women's shelters can be made more conducive to family life.

One promising way to make women's shelters more conducive to family life is by providing physical places that support activities that promote health and are generally favorable to mind and/ or body. The demands of life may have drained on the resources of families, adding to the importance of salutary places to unwind and recover. According to Hartig and Staats (2004) salutary places are places that contribute to renewing 'the physical, psychological and/or social resources and capabilities that are diminished in the ongoing efforts to meet adaptive demands' (p. 273). Restoration can be found in places that, for example, allow time away from obligations and demands and places that support positive exchange such as having fun or appreciating beauty (von Lindern et al., 2017).

For supporting families in shelters, provision of restorative moments alone may not be sufficient. The demands on life also require families to adapt to new circumstances. Finding new ways of being together, making new family routines, discovering new friends, gaining insights, and learning

1 Note: Not all women's shelters are women-only shelters. Women's shelters can also provide care for male victims of abuse, or to the men who are part of the family system such as fathers of the children and (ex)-partners of women in shelter care.

skills are examples of educational needs of families in shelters. In line with thinkers like Langeveld (1983) and Malaguzzi (Cagliari et al., 2016), places can have such educational value by facilitating or constraining certain sets of behaviors. A place with educational value teaches people how to live well where they live and helps identify and change ways of thinking that are harmful to the self or others (Gruenewald, 2003). Knowing that places can have a restorative and educational value gives importance to recognizing and validating such places so that professionals can use them in their work with families.

Natural environments provide possibilities for interacting with living elements like plants and animals and with non-living elements like fresh air, sunshine, water, and soil. Such environments are known to provide satisfaction of a diverse set of restorative and educational needs of both children and adults (for reviews, see Gill (2014);Russell et al. (2013). Regular park visits with the family can lower the stress of parents (Razani et al., 2018) and being in a natural environment is linked to more, longer and more responsive conversations between parents and children compared to being in an indoor environment (Cameron-Faulkner et al., 2018). Qualitative studies underscore a potential link between nature and family interactions (Ashbullby et al., 2013; Baklien et al., 2016; Izenstark et al., 2016) when families report that their activities in nature provide quality time for the family with moments to have fun, to bond and interact, and to strengthen the feeling of family cohesion.

Only few studies report on the impact of nature on family life, but research in individual wellbeing may give insights as well. Nature can offer enjoyable ways of spending free time by supporting leisure activities for adults (Godbey et al., 2005) and an interesting play setting for children (Norðdahl & Einarsdóttir, 2015) with rich opportunities for diverse play (Dowdell et al., 2011; Lester & Maudsley, 2007). Possibilities for leisure time can be viewed as an essential component of family life, because leisure time supports improved family functioning (Zabriskie & McCormick, 2001), family resilience (Hutchinson et al., 2007), and satisfaction with family life (Agate et al., 2009).

Furthermore, nature can offer a meeting place for people that supports social connections between adults (Weinstein et al., 2015) and feelings of social support for children (Van Dijk-Wesselius et al., 2018). Social connectedness can be an important factor in the support of families in shelters, because a community can bring support when families struggle and thus function as a buffer for the impact of risk factors on family life (McConnell et al., 2011; Prelow et al., 2010; Serrano-Villar et al., 2017; Taylor et al., 2015).

Nature is also known to support psychological wellbeing. Firstly, nature supports restoration of cognitive resources in adults and children, such as attention and working memory (Berman et al., 2008; Schutte et al., 2017; Ulset et al., 2017) and creative thinking (Atchley et al., 2012; van Rompay & Jol, 2016). Secondly, nature supports adults and children in recovering from stress and in experiencing positive feelings and emotions (Chawla et al., 2014; Kertes et al., 2017; Mitchell et al., 2015). Thirdly, nature is described as a place that people go to for spirituality and personal guidance, as they have done at various times in history and in various places in the world (Marcus

& Barnes, 1999), to this day when the spiritual power of nature is used in therapy settings (Berger, 2008; Corazon et al., 2011). Psychological wellbeing is not only desirable to the individuals within a family but is described as a key factor in family functioning, positively contributing to parenting behavior (Taraban & Shaw, 2018) and to a balanced family life (Olson, 2000).

Providing possibilities to perceive or interact with nature in shelter gardens may make shelter services more conducive to family life, however, research does not yet provide conclusive insight. Firstly, the vast majority of studies focus on investigating the effect of nature on individuals rather than families (Chawla, 2015). Empirical findings on the impact of nature on individuals may not be generalizable to families, since reported effects on individual wellbeing do not implicate effects on the quality of family life. Research with a specific focus on family life is needed. Secondly, not all nature interventions are applicable in the context of shelters (e.g. for people who need protection, walks in a forest may not be possible) and the restorative impact of nature interventions may be unique for this specific group of people (e.g. for people who experience fear, being away from standard routines may not be restorative). To know if nature can be used to improve shelter services, research in the context of shelters is needed. More specifically, the insight of shelter professionals is needed. Shelter professionals are reflective professionals whose work it is to evaluate the impact of their professional actions on the basis of signals from the family in relation to the goals they have with their shelter care work. To know if the introduction of nature in shelters can make shelter services more conducive to family life, their professional perspective is of value. In our study we explore the benefits of nature for family life in women's shelters by conducting action research with shelter care professionals who introduce nature in their daily family supportive work. The research question is: What are professionals' perspectives on the benefits of nature for family life in women's shelters?

METHOD

Context

This study was conducted in Dutch shelters that provide temporary homes for families who experienced forced prostitution, honor assault, or abuse. The Dutch nationwide trade association for shelters initiated a project called 'Safe Future' to improve the living quality of families in shelters. As part of this project all 20 locations for women's shelters in the Netherlands were invited to participate in this research and use nature in their care practice. Four shelters applied and received the funding for greening (varying from 28.000 to 60.000 euro / approx. 31.000 to 66.000 US dollar). One shelter was not included in this study because professionals scarcely used nature. The three participating shelters introduced nature into their shelter services.

The first shelter (S1) provided care for men and women and their families after domestic abuse. The location had 4 houses for 24-hour care, each for two to three families, and ambulatory 8-hour day care for families after they have moved out of the shelter. On average, families stayed one year in their care. The shelter was located in a rural area. This shelter created a children's farm with goats, rabbits, and chickens on their private property.

The second shelter (S2) provided care for teenaged mothers, victims of forced prostitution, women who experienced honor related threats, and women with multiple problems. The location had 40 places for intensive 24-hour care. Duration of stay for families varied depending on the complexity of the problem, from 12 weeks to several years. The area was suburban. This shelter used a natural playground with grass, sand, and swinging, sliding, and climbing elements on their own property, as well as a meadow and a small forest adjacent to the shelter.

The third shelter (S3) provided care for families with complex problems and/or multiple problems (addiction, mental disabilities, violence, psychiatric problems). The location had 18 places for intensive 24-hour care and 90 places for ambulatory care. On average, families stayed one year in their care. The shelter was located in an urban area. This shelter used its courtyard with grass, trees and a small, neglected vegetable garden, as well as a park near the shelter with grass, water, benches, and walking paths.

Local police and shelter security scanned the natural environments for safety and adjustments were made where necessary such as higher fences to prevent people from looking into the gardens, fixed times during the day when only shelter families were allowed in the outdoor areas, wearable alarms for shelter families, and extra police presence in the public outdoor areas.

Design

The aim to explore professionals' perspectives of the benefits of nature for family life was borne out of researchers' hypothesis that such benefits may be possible but without any preconception about professionals' understanding and expectations. The researchers did presume that professionals can and do reflect on the potential benefits of nature and that such reflection supports their exploration and their development in the understanding of these benefits. Therefore, action research (Reason & Bradbury, 2007) was chosen as the appropriate method of research.

To allow such exploration and development in understanding, Communities of Practice (CoPs) were formed (Wenger et al., 2011), which are learning partnerships among colleagues who interact regularly with the intention to use each other as a learning resource. In our design, care professionals and researchers with diverse professional backgrounds collaborated in CoPs with the intention to develop their understanding of the benefits of nature by attempting to realize these benefits in practice and constructing knowledge on that practice in a dynamic interaction between academic colleagues and colleagues from practice (Schuiling & Vermaak, 2017). A systematic structure was developed in which this diversity in subjective perspectives could be expressed, questioned, and recalibrated, aiming for an intersubjective understanding.

Participants

Each shelter delegated a group of care professionals who worked with families, who had an interest in exploring the benefits of nature for family life, and who agreed to participate in the research. In total, 46 care professionals and four researchers participated in three CoPs. For details, see Table 1.

Table 1. *Members of the Communities of Practice (CoP)*

Position	N CoP members	CoP1 in shelter 1	Cop 2 in shelter 2	CoP3 in shelter 3
Social Worker	34	13	7	14
Social Worker student trainee	7	5	-	2
Psychologist	2	-	2	-
Shelter Manager	3	1	1	1
Researcher (researchers participated in more than one CoP)	4	3	3	2

Procedure

Care professionals introduced nature into their work with families. Nature activities were personalized, based on the professionals' knowledge of the family and responsive to the family's possibilities and needs. The Results paragraph gives examples of the family moments in nature.

Each member of the CoP, being both care professionals and researchers, worked from October 2016 until April 2017 on exploring the benefits of nature for families in shelters by using nature in shelter work, interviewing and observing families, observing other members' practices, reflecting on practice and studying literature. All members of the CoP shared their acquired insights and questions during three CoP-meetings which took place bi-monthly. The insights generated possibilities for changes in strategies and practices, which were subsequently implemented and evaluated to allow continuous investigation. Each CoP was set up in a cycle of reflection, inspiration and action (Fig. 1) allowing the CoPs to continuously build on acquired insights and to progress in the understanding of the potential benefits of nature for families in shelters. By facilitating a simultaneous and interlinked development of research and practice, we aimed for a process of progressive insight (Hovinga, 2007).

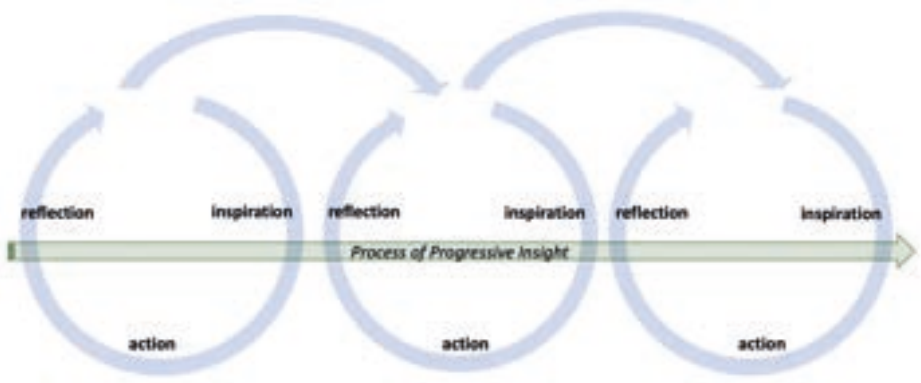

Figure 1. The cyclical process of gaining progressive insight through collaborative working

CoP-meetings started with a moment of written reflection and shared reflective conversation based on the questions: 'What activities (to gain insight in the benefits of nature for families in shelters) did you do in the past period? What insight(s) did you get? From whom or what did you get these insights? Why is that insight valuable to you?'. The CoP subsequently shared a moment of inspiration by sharing knowledge, experiences and theoretical constructs. Examples of inspirational activities were sharing preliminary insights from data analysis, reading literature together, undertaking nature activities, or sharing written case descriptions in which professionals described their examples of practice. Case descriptions were based on the questions: 'What was your goal with these family members? You chose to use nature: with what intention did you use nature? What did you observe in this woman/man/child?'. CoP-meetings ended with a moment of written action planning. Action planning was based on the questions: 'What did you do or hear today, that you can use in your work (in exploring the benefits of nature for families)? What is your action plan for the coming period?'.

Data collection

The CoP-meetings were audio recorded and transcribed verbatim. The data consisted of transcripts of 18 hours of CoP-meetings, along with the written action plans, case descriptions and reflections that professionals brought to or made during the CoP-meetings.

Data analysis

The data were analysed via thematic analysis (Liamputtong, 2019). Aiming to explore the professionals' perspectives required an open working position from the researchers. Such insight could not be obtained when researchers worked from an a priori stipulated theoretical, academic, or philosophical view of the reality of professionals. Inductive analyses were conducted to openly explore professionals' perspectives. Two researchers extracted quotations on the perceived benefits of nature from the dataset and read each quotation carefully both as a single quote and as a quote in the context of the whole dataset to capture the topics discussed. Semantic

codes were generated and combined where possible to produce coherent subthemes, which were grouped under higher-order master themes. We used a reflexive dialogue with the data, guided by the research question, in which every interpretation is valid for as long as it is not contradicted by the data itself.

To control the quality of the data, the interpretations, the consistency in meaning making and the intersubjectivity, researchers used several strategies (Hadi & Closs, 2016): 1) prolonged engagement: researchers committed themselves to the shelter practice for a period of six months in order to be able to understand the data within the relevant context; 2) replication: researchers used three CoPs to be able to compare findings; 3) triangulation: researchers collected multiple types of data, that is audio recorded CoP-meetings, written action plans, written case descriptions and written reflections; 4) reflexivity and academic literature: researchers divided their roles during the process of analysis, with two researchers working on primary analyses, one researcher stimulating reflexivity by questioning motives, views and biases as the potential basis for decisions in the process of analysis, and one researcher questioning the relation between the findings and theoretical frameworks and published empirical findings; 5) peer debriefing: researchers were supported by a counselling committee formed by fellow researchers from three different universities; 6) thick description: researchers presented draft results to CoP-members to validate. The results were presented and discussed at an academic conference as well as a conference for practice to check the recognizability.

RESULTS

The study was aimed to explore professionals' perspectives on the benefits of nature for family life in shelters. Five central benefits emerged from analysis of the data and will be more fully described in arbitrary order: 1) Nature offers a place for family leisure time; 2) Nature supports social connectedness; 3) Nature supports psychological wellbeing; 4) Nature offers metaphoric experiences; 5) Nature supports parenting. We chose to use cases to illustrate the central themes found in the data. To ensure participants' privacy we created pseudonyms.

Nature offers a place for family leisure time

Nature came forward from the analyses as a place that facilitated family leisure time by allowing families to spend their free time together in an enjoyable way.

> Yasmin works with teenaged mothers who are the victim of forced prostitution. Today, she takes Nina and Nina's one-year-old daughter to the forest. Yasmin described: 'Nina had never been to a forest before. She couldn't believe her eyes; she could let her daughter walk by herself, because there are no cars. She just didn't know what that was. It was a beautiful, tranquil moment. So super tranquil. And so super cute: the daughter was walking with a leaf in her hand all the time. They really loved it and wanted to go again sometime soon. Being outdoors was .. well.. just really nice.' (S2)

In Yasmin's case description, nature facilitated family leisure time by simply allowing this family to have a nice family moment. Other CoP-members have described nature as a place that facilitates enjoyable family leisure time as well. Families for instance used nature for family dinner time, for having a family picnic, for play moments or to go for a walk together. One of the CoP-members described an enjoyable family moment: 'A picnic. Sandwiches to go. Children playing. The opportunity to enjoy time together.' Another CoP-member explained that these simple moments of family leisure are not always possible without having their own garden: 'I think it is a huge advantage for those families who are not allowed outdoors or cannot go outdoors, to be able to still go outdoors. Is that weird, to say that? That they can go outdoors, while staying on the shelter premises.' Another CoP-member adds: 'Also for the mothers of young toddlers. They can just go run and play. Right? And the child has plenty of room for playing.'

Nature supports social connectedness

Places in nature were described to support social connectedness with people outside the family. Nature was described as a meeting point, like a garden bench where parents sat together to watch their children play, or a lookout post in the back of the garden where teenagers met in the evening. Situations in nature were described to elicit social interaction.

David, a case worker, describes how important the children's farm is for social connectedness. 'This morning the fence wire was broken. And one of our clients[2] saw it, came up with a solution and fixed the wire. And this afternoon, we needed someone to watch over the fireplace while the fire was burning out. And Martin and that boy, Hank, just said: "sure!" That is just wonderful. The spontaneity. The collaboration.'
Karen adds: 'And remember when that rabbit got ill? The women came to us and said they had a bad feeling about that rabbit and someone needed to look after it. And when I told them in the morning that the rabbit had passed away, they were really caring for each other and asked me to tell the other clients before they got in, because otherwise it would be too upsetting. Just that interaction. The care for each other.'
David continues: 'I think it is a good thing that we are all involved with each other. That we have more than only living: the collective experience.' (S1)

In this case nature invited people to work together, interact, and act in the common interest. Interactions in nature were described as less tense and conflictive than interactions in the indoor setting of the shelter. One of the CoP-members tried to describe how nature in shelters helps to support positive interactions, perhaps by simply providing more living space: 'It clashes, at this moment very much. Children feel a bit… the room is too small. They want to release their energy. You see: all of them indoors leads to a lot of conflict and agitation.' He continues: 'I think they are less in each other's pockets when they are outdoors. And that makes them more relaxed and better in playing together. Less conflict. With a large outdoor play area… It goes easier. Yes.'

Nature supports psychological wellbeing

Nature is described to support psychological wellbeing of children and adults. CoP-members described nature as a place that offers the possibility for psychological wellbeing by providing an escape from negative emotions, and by supporting creative thinking and problem-solving.

Ann, a family worker, describes the case of Ewa and her son Kevin. 'Ewa collected Kevin from school one day and took him with her to the shelter, sudden and unprepared, to which he responded by becoming quiet and withdrawn. For Ewa, the flight from her home was emotional and she tried to stay strong for her son. I decided to take them into the kitchen that overlooks the garden where two goats, a chicken and a few rabbits live. I did that on purpose, because the goats are very nosy and as soon as someone steps into the kitchen, they jump up the window frame and stick their faces against the windows.'
In a confusing moment like an intake, the goats can help focus on the here-and-now, Ann says. The animals come to Ewa and Kevin, bite their clothes and look for food, which gives little room for rumination. 'And I don't have to do anything', Ann adds, 'the relaxation just comes from the animal.' (S1)

In the example of Ewa and Kevin, nature is described as a place that offers the possibility for psychological wellbeing by providing an escape from negative emotions. Ann explains: 'It is really funny because whenever you are there, there is a goat staring at you in a very merry mood. Their

2 A client is a person in shelter care.

silly, sheepish way of looking, their self-absorbed behavior, the pig-headedness and clumsy actions bring laughter and distracts from worries and stress.' Other CoP-members have also described nature as a place to escape from negative emotions and stressors, in examples of nature providing possibilities for physical activities to lose adrenaline after trauma-counselling, nature providing tactile experiences for people feeling apathetic, or nature providing a feeling of mindfulness for people feeling stressed. In addition, nature is described to support creative thinking and problem-solving. One of the CoP-members described a case of a mother whose thoughts had focused on the possible causes and consequences of her situation rather than on its solutions: 'I have said before to clients, if things are overwhelming, or they feel in need and the walls are closing in on them, then I say: "Just go out for a walk. Make sure that you…" how shall I put it? "… that you broaden your view".' Another CoP-member added: 'Just getting out once a day to break up the day, that is super. Getting your concentration back. New energy. Get a fresh approach, imaginative, rich in fantasy.'

Nature offers metaphoric experiences

Nature was used in therapy settings specifically for its ability to offer experiences that are metaphoric to events in life.

> Adiva is Sonia's therapist. Sonia has been indoors for weeks. Adiva fears Sonia will become apathetic and consults the psychiatrist who is in turn worried about her depressive feelings and her ability to take care of her child. They feel that being outdoors will do her good and Adiva decides to use the therapy meeting for walking. 'Now she has to put on her coat, leave her living space, literally step out and that is a metaphorical step she takes. We get into action, we go somewhere. A sort of a feeling of: now we get into action', Adiva describes. During the walk, Adiva notices something else too. It seems to be helping to walk beside Sonia instead of sitting opposite to her during therapy. 'You don't have to look each other in the eyes constantly. That is often, in a conversation with a teenager, quite … Just walking side by side to each other and having the same view. (…) There is a different dynamic, when you literally walk side by side to each other. Then you look in the same direction as the client. You can put yourself in the client's position when you literally move with them.'
>
> The experiences during the walk turn out to be useful as metaphors to use in therapy. As an example, when Sonia talks about spring and the new green leaves, Adiva uses this to start the conversation about the growing potential of nature and the growing potential of Sonia as a mother. (S3)

In this example, Adiva described nature as a place that provided metaphors to real life events, such as taking steps, experiencing partnership, or growth. Other CoP-members described this metaphoric value as well in examples of spring that brings hope, open skies that resemble clearness of mind, or chattering birds that sound like gossiping friends. In some of these metaphors, the link to real life events is made explicit and used as input for conversation, like one of the CoP-members describes: 'I was with this boy at the farm observing the rabbits. "When a rabbit acts like this, it means he is scared", I said. "Are you like that sometimes?".' In other examples, the link to real life events is implicit, like in the example given by one of the CoP-members: 'The goats bite your clothes and whether you like it or not they come very close. So, well. That's about setting

your boundaries. Deciding to leave. Learning to take initiative. And that teaches you to do it with people too.'

Nature supports parenting

The final benefit that emerged from the data is that nature supported parenting.

> Mark, the father of Tim and Paul, comes to visit. Evelyn is their social worker and describes that a visit can be uneasy to both father and children, because meeting in a reception room with a social worker present is an unnatural way of spending time together. 'Father first came into the reception room but that lasted only 10 minutes, because the children wanted to go outdoors, you could tell. Well, then we sat down here and just enjoyed. Children picking flowers and everything, playing football, going on the slide.' Evelyn explains that for this father and his children, being outdoors is what they like doing and is how they are used to spend time together. 'That is what they used to do as well, when they all lived at home. They went to the children's farm with their father every week. So that was nice to see. A habit they could continue here.' To them, it is their familiar way of being parent-and-child. The possibility to use the garden allowed them to spend time together in their own way. Evelyn's colleague explains how such moment supports positive contact between the father and his children: 'It is something else to be jumping on the trampoline together or to be sitting at the table drinking tea. The contact is less forced, more casual, just being outdoors.' (S1).

In Mark's example, the natural environment gave him and his children freedom to undertake things they like doing and to interact in ways they deem fitting. It provided him as a father with autonomy. In other examples, nature is described as a place that supports moments of relatedness between parent and child. One of the CoP-members described a moment with a mother who finds it difficult to connect with her daughter and does not want to hold her or look at her. 'This mother took a picture of her child while being outdoors. It makes her consciously see her child, and that is something that is often lost. It is endearing for me to see. And how is that for the mother herself? That must be a thousand times stronger, I think.' Nature is also described to support moments of experienced competence in parenting. As an example of experienced competence in nature, a CoP-member described that a young mother took her crying baby for a walk around the courtyard and experienced that the walk calmed the baby down. 'The mother experienced that the child can find calmness and that she can facilitate that in her child.'

In addition, moments in nature offered care professionals insight in the need for parenting support that parents have. With nature being unpredictable and providing risks like getting out of sight, hurting yourself, or getting dirty and wet and cold, it required different parenting skills from being indoors. In nature, professionals saw parents limiting the children in their freedom in play or giving children little restrictions. 'For us, it is a good moment for observation: how do they cope as parents?'.

DISCUSSION

According to professionals working with families in women's shelters, the use of nature in women's shelters affords families with leisure time, social connectedness, wellbeing, metaphoric experiences, and it supports parenting practices. The found affordances on leisure time, social connectedness, wellbeing and metaphoric experiences concur with evidence for effects of nature in other domains of life, such as schools and living environments (for reviews, see Gill (2014); Russell et al. (2013). Although the themes were distinguished for analytic purposes, these can be intertwined (Hartig et al., 2014; Markevych et al., 2017) with leisure time spent in nature as a possible precondition for experiencing nature's benefits, and with the social connectedness experienced in nature as a pathway to psychological wellbeing.

A novel finding was that nature potentially supports parenting. The comments made in the Communities of Practice provide the basis for hypothesizing that nature supports parenting by providing relatedness between parent and child, parental feelings of competence, and autonomy in parenting. In the Self Determination Theory, relatedness, competence and autonomy are described as basic psychological needs that foster motivation and engagement (Ryan & Deci, 2017). Arguing from this theoretical perspective, enhanced parental basic psychological needs leads to more motivated and engaged parenting. This finding is of particular importance, knowing that parents who bring their children up in women's shelters often encounter specific and unique risk factors that make parenting difficult, particularly linked to parents' autonomy and experienced competence in parenting (Anthony et al., 2018; Bradley et al., 2018; Glenn & Goodman, 2015; Peled & Dekel, 2010). For parents who live in women's shelters, restoration of parental basic psychological needs might be needed even more than for any other parent. Future research should add to insight gleaned from lived experience and observations by testing the hypothesis that nature provides levers for intervening in basic psychological needs for parents in shelters.

There are several possible pathways to explain nature's potential impact on parenting. Firstly, nature's potential impact on parenting can be explained through nature's effect on social connectedness and psychological wellbeing, factors known to positively impact parenting (Armstrong et al., 2005). Secondly, a possible pathway is through nature's effect on metaphoric experiences, since reflective moments are known to function as buffers between stress and parenting behaviors (Fonagy et al., 2018; Slade, 2005). Future research can include these as possible mediators.

Strengths and limitations

The three participating shelters had the intention to use nature in their daily practice, which may have led to a selection bias in shelter professionals with a basic positive attitude towards nature. No comparison contexts were studied, which makes it possible that benefits found in the context of nature can also be found in other contexts such as art therapy, cooking or sports activities. It is possible that the results are not only related to the natural aspects that were introduced, but to the larger living space and greater mobility that came with the implementation of nature.

In our study the integration of nature was initiated by the professionals. It is worthwhile to investigate how families feel about using nature as part of their care. It is possible that the observations of professionals did not coincide with the actual experiences of the families involved, especially in relation to adverse moments in nature. Professionals described adverse moments, such as the goats that came too close and bit, as valuable from a therapeutic point of view. Future research should gather data from families to get a closer insight in their experiences. Relevant implications for practice can be acquired by focusing not only on whether families value nature as part of their care, but also on the types of nature interactions that are considered supportive to family life.

The research approach facilitated a dynamic interaction between academic knowledge and field knowledge, with the intention to acknowledge and use both as a resource in the process of exploration. Researchers and professionals questioned and further developed preconceptions through exchanges about their daily practices. These exchanges were situation bound and based on subjective experiences. We aimed to progress from subjectivity to intersubjectivity by facilitating 'an intersubjective critical debate in which everyone gets the chance to put their claims to the test' (Boog et al. 2019, 17). We did so by using prolonged engagement, replication, triangulation, reflexivity, peer debriefing, and thick description. The results are a product of this process. The majority of the findings are in line with previous research, which gives validity to the findings and strengthens the one finding that is new and unexpected: the hypothesis that nature supports parenting. Other more controlled research designs are necessary to test the extent to which the insights are justifiable and intersubjective.

Overall conclusions

According to professionals in shelters, including nature in supporting families during their stay might benefit family life. Professionals' explanations for those benefits could be summarized along basic psychological needs for agency and wellbeing for families under stress.

Data availability statement

Due to safety concerns for the families, the raw data of this study are not publicly accessible. For access to the dataset for verification, please contact the corresponding author.

Chapter 2.
A Quasi-Experiment

Experiencing nature to satisfy basic psychological needs in parenting: A quasi-experiment in family shelters.

Published as

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The results of this study have been shared via

- Presentation for professionals at Perspektiek De Terp, Den Haag, on September 17th, 2020.
- Keynote speech at 'Huisje Boompje Beestje' Closing Conference organized by Valente Branchevereniging voor Opvang en Stichting Kinderpostzegels on November 30rd 2020.
- Factsheet, sent to all shelters that participated in the studies in this dissertation:

  Van den Bogerd, N., Peters, E., & Hovinga, D. (2021). Huisje Boompje Beestje: Hoe natuur de kwaliteit van de vrouwen- en maatschappelijke opvang voor kinderen kan versterken. Factsheet can be retrieved from: https://www.hsleiden.nl/binaries/content/assets/hsl/lectoraten/natuur-en-ontwikkeling-kind/factsheet-huisjeboompjebeestje.pdf

Self-determination theory (Deci & Ryan, 2000) was conceived to understand the conditions that support or thwart human psychological flourishing. This theory poses three basic psychological needs as essential for growth, integrity and wellbeing: the need for autonomy, the need for relatedness and the need for competence (Ryan & Deci, 2017). In the context of parenting, these needs pertain to the freedom to make parenting decisions and to take ownership of one's own actions (autonomy), feeling close and connected to one's children (relatedness) and feeling competent and skilled in parenting (competence) (Brenning et al., 2017). Basic psychological needs have been assessed to understand individual differences in parenting experiences. Parents who find fulfillment of their needs for relatedness, competence and autonomy in their role as parents would be more prone to experience wellbeing (Brenning et al., 2017; Gauthier et al., 2010; Jungert et al., 2015; Ross-Plourde & Basque, 2019) and maintain autonomy-supportive parenting practices (Brenning & Soenens, 2017; Jungert et al., 2015; Mabbe et al., 2018). Self-determination theory may therefore be useful for evaluating efforts to optimize the social or physical environment in which parenting occurs.

The impact of living in a shelter on parents' opportunities for need fulfillment

While it may sometimes be hard for any parent to find need fulfillment, this may be especially the case for parents who live in shelters after becoming homeless or after escaping violence. Conditions in shelters may limit the possibilities for need fulfillment and may even actively frustrate parents in their attempts. Parents have reported that the crowded, noisy and chaotic living spaces (Pable, 2012; Sylvestre et al., 2018) and imposed shelter rules (Glenn & Goodman, 2015) limited them in using their own routines and rules (Anthony et al., 2018; Mayberry et al., 2014), which may frustrate the need for autonomy. Parents have also reported that the lack of privacy made them vulnerable for scrutiny and criticism by staff and other parents (Azim et al., 2019), which may frustrate the need to experience competence. Limited access to safe and engaging environments is reported to restrict parents in their opportunities for positive parent–child interactions (Bradley et al., 2018), which may frustrate the need for experiencing relatedness. Moreover, shelter rules and routines may detract from parental authority, roles and responsibilities and, in some cases, even lead to parents stepping away from their parenting duties and ceding this role to shelter staff (Anthony et al., 2018), eliminating satisfaction of basic needs from parenting altogether.

In recognition of the many challenges facing homeless and violence-exposed parents and children, shelters may use several avenues for supporting parents. Shelters provide a safe place to live for parents and their children (WAVE, 2019), temporarily support them with practical hassles and stressors (Jonker et al., 2012; Lyon et al., 2008), provide social work to find balance and transition to an independent life (Jonker et al., 2014) and offer specific interventions with regard to, e.g., parent–child relatedness and parental competence (Haskett et al., 2016). On top of that, shelters may try to enhance the wellbeing of parents and children by introducing nature (Grabbe et al., 2013; Reizvikh, 2016; Renzetti et al., 2014; Walker & Clacherty, 2015).

Experiencing nature to support parents in their need fulfillment

A qualitative evaluation of the introduction of nature into shelters suggested that experiencing nature may support parents in fulfilling their parental basic needs (Elise Peters et al., 2020). In this participatory action research project, professionals observed that having a natural environment at the shelter property allowed parents to undertake activities of their own choice and to interact with their children in ways they deemed fitting, and that being in nature supported parents to feel connected with their child and to have positive ways of interacting. Such immediate and temporary effects of experiencing nature are consistent with the strong day-to-day fluctuations in need fulfillment reported by Brenning et al. (2017). It is therefore important to test whether creating more opportunities for experiencing nature would also lead to more need fulfillment.

The aim of this study

The primary aim of this study was to investigate if experiencing nature was associated with basic psychological needs of parents in shelters. We expected that parents would report more parental need satisfaction and less parental need frustration when experiencing nature than when they were in the standard indoor shelter environment.

The secondary aim was to test whether children's age, shelter type and nature connectedness moderated the association between nature and need satisfaction. The theory of affordances (Gibson, 2014) suggests that the activities to which physical environments give rise depend on the specifics of the human being in that environment. This means that the support provided by an environment varies from person to person. Parenting roles differ per developmental stage of the child. When children grow older, the demands on the parents change from being close and available towards indirect monitoring and psychological autonomy granting (Cummings et al., 2002). This means that environments will have specific affordances for parents of younger children (such as allowing or disallowing parents to be monitoring and scaffolding their child while being close by and available) and specific affordances for parents of older children (such as allowing or disallowing parents to support their child in forming their own friendships and to be monitoring the child indirectly). Given the lack of specific theory and previous work suggesting the direction of the moderating effect of a child's age on the effect of nature on parental need fulfillment, the moderating effect was explored.

Affordances of nature may vary between people who are in a shelter due to homelessness for financial reasons and people who are admitted due to threats of violence. Experiencing nature might be stressful for the latter group because of the risks of being away from the shelter, which affects the balance of threats (or negative affordances (Gibson, 2014)) and promises (or positive affordances (Gibson, 2014)) from such an environment. For this reason, we include type of shelter as a potential moderator, expecting that the strength of the association between experiencing nature and need fulfillment was strongest for parents who were in a shelter due to homelessness.

Feeling connected to nature may be related to the satisfaction of the basic psychological need of relatedness by allowing feelings of love, kindness and empathy (Cleary et al., 2017). Although

research to date has mainly focused on feelings of relatedness to the world, and not on parent–child relatedness specifically, we do include parents' nature connectedness as a possible moderator. We expected that the strength of the relation between experiencing nature and need fulfillment was strongest for parents who felt connected to nature.

METHOD

Participants

This study was conducted among parents with one or more children under the age of 18 who lived with their children in a participating women's shelter or homeless shelter in The Netherlands at the time of data collection. Parents were excluded from participation when their care professional assessed them not fit for understanding the study information due to illiteracy, language problems and/or intellectual disabilities. The overall majority of participating parents identified themselves as female (91%).

The parents were selected from 20 shelters that participated in a Dutch nationwide project aimed to enhance the wellbeing of families in shelters through the development and use of natural environments. Parents were selected and approached for participation by their shelter care professional. Parents were informed about the goal to study fluctuations in basic psychological need satisfaction and frustration among parents residing in shelters. Parents were explicitly informed that shelter professionals had no access to the provided information and that their participation would have no consequences for the care they and their family received. Parents received no payment.

Based on power analysis in G*Power for two groups, two measurements, with a power of 0.95, alpha of 0.05 and a medium effect of between x within interaction f(V) of 0.10–0.15, we aimed for 146 participants. A total of 167 participants were recruited. Data of seven participants were removed because the data collection did not occur according to procedure, resulting in a total of 160 participants (Table 1).

Table 1. Characteristics of the study population: continuous variables presented as means with standard deviations (SD); categorical variables as numbers (n) with percentages (%).

Variable	N (%)	Mean (SD)	Range	Missing
Shelter type				
-Women's shelter	112 (70%)			
-Shelter for homeless families	29 (18%)			
-Combined women's/homeless shelter	19 (12%)			
Age of parent		32 (6.9)	19–65	26 (16%)
Gender of parent				
-Female	145 (91%)			10 (6%)
-Male	1 (<1%)			
-X (third gender or no gender)	4 (3%)			
Parent's nature connectedness		4.12 (1.6)	1–7	95 (59%)
Child's age		5.28 (3.6)	0–16	37 (23%)

Data collection took place from October 2018 until February 2019. The Scientific and Ethical Review Board of the Faculty of Behavioral and Movement Sciences of the VU Amsterdam approved of the study protocol (VCWE-2018-0138).

Design and Procedures

This study followed a two (within-subject; measurement) by two (between-subject; environment) crossover quasi-experimental design. Two measurements of parental need satisfaction and need frustration were conducted in two conditions: during the families' usual daily routine in the standard indoor environment of the shelter, and while the family experienced nature.

Children's age, shelter type and parents' connectedness to nature were included as moderating variables.

Intervention

Nature Experience

Shelter care professionals facilitated a nature experience for families under their care. Nature experiences included an experience through sensory perception (e.g., sitting in the sun or listening to bird songs) or through interaction (e.g., gardening or walking the dog) with living organisms like plants and animals, or with—what is in Western cultures called—"non-living" natural elements like water, sunlight and soil. Experiences with nature were personalized based on the professionals' assessment of the emotional state of the family members (e.g., allowing family members feeling angry to visit a natural environment that afforded coping activities), on the families' current level of risk for being away from the shelter (e.g., allowing families with the highest risk level to experience nature in a protected and enclosed natural environment and allowing more freedom of movement for families with lower risk levels) and on the religious and cultural backgrounds of the family (e.g., allowing Muslim families to experience only halal nature experiences). We chose for this personalization to make inclusion of the very diverse population of shelter clients possible.

Professionals chose a nature experience based on their general knowledge of the family and which was responsive to the family's possibilities and needs. Professionals initiated the nature experience and were present when the family experienced nature.

Comparison Condition

Shelter care professionals visited the families for their usual daily check-in with the family during a moment of parent–child interaction in the family's daily routine in the standard indoor environment of the shelter.

Data Collection

The research protocol defined a three-week period for data collection. Each professional chose a moment within these three weeks to deliver the intervention to the family. Professionals chose a moment for delivering the comparison condition within a seven-day time span from the intervention.

During the nature experience and in the comparison condition, parents filled out an online questionnaire about their own age and gender and that of their child, their parental need satisfaction and need frustration and their connectedness to nature. When parents were not able to read the questionnaire independently, the professional sat opposite of the parent, read the questions and possible answers out loud and allowed the parents to answer the questions privately.

At both measurements, professionals filled out an online questionnaire in which they provided the date and time, the name of the shelter, a written observation of the need of the parent based on the question "What parental need did the parent have at this moment?", a written description of the activity based on the question: "What exactly happened? Describe the activity", and a written observation based on the questions: "What did you notice in the parent? And what else? And what else?". In this study, we used the observational data only for checking if the intervention met the criteria of an experience through a sensory perception or interaction with living organisms or "non-living" natural elements.

To be able to check for sequence effect, the shelters were manually preassigned to two pre-specified subgroups, aiming for two subgroups of the same size and with an equal division of women's shelters and homeless shelters. Participants from shelters in subgroup one ($N = 92$) did the standard indoor environment of the shelter (comparison condition) first and the nature experience (intervention) second. For participants from shelters in subgroup two ($N = 68$), this sequence was reversed.

Measurements

Psychological Need Satisfaction and Frustration

The twelve questions from the Dutch parenting version (Brenning & Soenens, 2017; Brenning et al., 2017) of the validated Basic Psychological Need Satisfaction and Need Frustration Scale (Chen et

al., 2014) were used to assess psychological need satisfaction and frustration. The questionnaire contains statements on satisfaction of the basic psychological need of relatedness (e.g., "Today, I felt connected with my child"), competence (e.g., "Today, I felt confident in what I did for my child") and autonomy (e.g., "Today, I felt a sense of choice and freedom in the things I did with my child"), as well as statements on the frustration of basic needs of relatedness (e.g., "Today, I felt a distance between my child and me"), competence ("Today, I felt insecure about my abilities with my child") and autonomy (e.g., "Today, I felt forced to do things for my child I did not choose to do"). Items were rated on a scale from 1 (completely not true) to 5 (completely true). Average scores were created by computing the average of the six items for need satisfaction and the six items for need frustration. The Cronbach's alphas for need satisfaction and need frustration were both 0.74.

Connectedness to Nature

Schultz (2002) Inclusion of Nature in Self Scale (INS) was used to assess connectedness with nature in both parents and professionals. This graphical single-item scale contains seven pictures of two circles, with one circle named "self" and the other circle named "nature", which differ in degree of overlap. Parents and professionals were asked to rate their connectedness to nature by choosing one of the seven pairs of circles. Circle pairs were rated from 1 (complete separation of the two circles) to 7 (complete connection of the two circles). Although Martin and Czellar (2016) suggested an extension on INS to improve the construct and predictive validity, the single-item INS showed a workable test–retest reliability of 0.77 ($p < 0.001$) (Martin & Czellar, 2016) and was chosen because it is concise and easy to administer. For analyses, we used the average between the INS score measured in the indoor context and the INS score measured while experiencing nature.

Children's Age and Shelter Type

Children's age in years was reported by the parent. Shelter type (being a shelter for homeless families, a women's shelter or a combined women's and homeless shelter) was reported by the parent's care professional. We refrained from collecting other personal data to limit the amount of identifiable information.

Quality of Measurements

Training

Professionals were trained in four training sessions to be able to facilitate a nature experience for families in their care and to be able to collect data according to the research protocol. After the first training session, the professionals conducted a tryout of data collection in which they got feedback regarding the consistency with the research protocol. After the second and third training session, data collection occurred. The fourth training session was a closing session with reflection on the results of the study.

Setting Conditions

To allow the participation of parents with diverse backgrounds and safety concerns, it was necessary that all shelters had safe natural environments on their own property. Each shelter received funding for developing a natural environment, varying from EUR 10,000 (approximately

USD 11,080) to EUR 65,000 (approximately USD 72,000). Shelters developed a restorative garden, a natural play area, a children's farm or a vegetable garden. Shelters were assisted in the development of the natural environments by spatial planners, animal experts, gardeners and construction workers. Data collection started when all shelters had the possibility to use a natural environment. The natural environments that were used in this study are specified in Table A1.

Statistical Analyses

The associations between experiencing nature and parental need frustration and need satisfaction were analyzed using linear mixed model analyses in SPSS Statistics for Windows, version 27 (SPSS Inc., Chicago, Ill., USA), accounting for the clustering of the two measurements (level 1) within participants (level 2) within shelter locations (level 3). Although we were not interested in the higher-order effects, we chose to incorporate the shelter location as level 3 to be able to produce more accurate standard errors (Lai & Kwok, 2015). The unstandardized coefficients were converted to standardized mean differences (Cohen's d) (Feingold, 2015). Analyses of effect modification using two-way interaction terms were conducted for each of the potential moderators. Interaction terms with a p-value lower than 0.05 were identified as moderators.

RESULTS

The participant flow with the total number of participants at each stage of the study is given in Figure 1, including reasons for drop out. We computed maximum likelihood estimates for missing data on the outcome variable. Table 1 shows the characteristics of the study population.

The normal distribution of the residuals was moderately skewed (for need satisfaction −0.75 (SE = 0.15), for need frustration 0.94 (SE = 0.14)) and had low kurtosis (for need satisfaction 0.5 (SE = 0.29), for need frustration 0.59 (SE = 0.29)). Q–Q plots and scatter plots showed a proximal normal distribution (Figure A1). Figure 2 shows the basic statistics on parental need satisfaction and need frustration. Participants reported a higher parental need satisfaction (Mnature = 4.38, SD = 0.52, 95% CI 4.29–4.46/Mindoor = 4,21, SD = 0.54, 95% CI 4.11–4.3) and a lower parental need frustration (Mnature = 1.66, SD = 0.64, 95% CI 1.55–1.77/Mindoor = 1.82, SD = 0.65, 95% CI 1.71–1.93) while experiencing nature compared to being in the standard indoor environment of the shelter.

Associations between Experiencing Nature and Parental Self-Determination

Multilevel regression analyses showed that parents reported statistically significant higher scores on need satisfaction and statistically significant lower scores on need frustration when experiencing nature as opposed to being in the indoor environment (Table 2).

Interaction terms (see Table A2) for the moderating effect of sequence, type of shelter and parents' connectedness to nature were not statistically significant. The interaction term for child age, however, was (p = 0.01 for need satisfaction, p = 0.02 for need frustration). The difference between basic psychological needs while experiencing nature as opposed to being in the standard indoor environment was bigger for participants with younger children (for need satisfaction B 0.04, SE 0.01, 95% CI 0.01–0.07; for need frustration B −0.04, SE 0.02, 95% CI −0.08–−0.01).

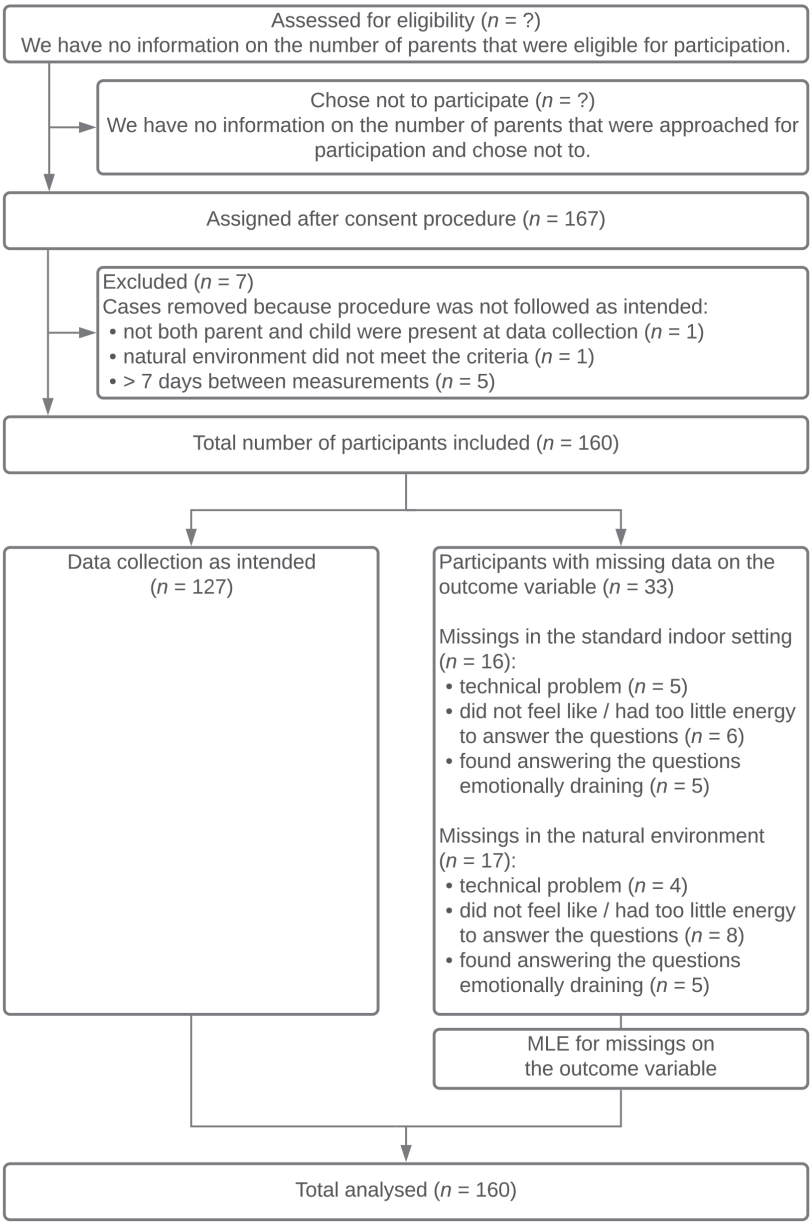


Figure 1. The flow of participants with the total number of participants in each group at each stage, and reasons for drop out.

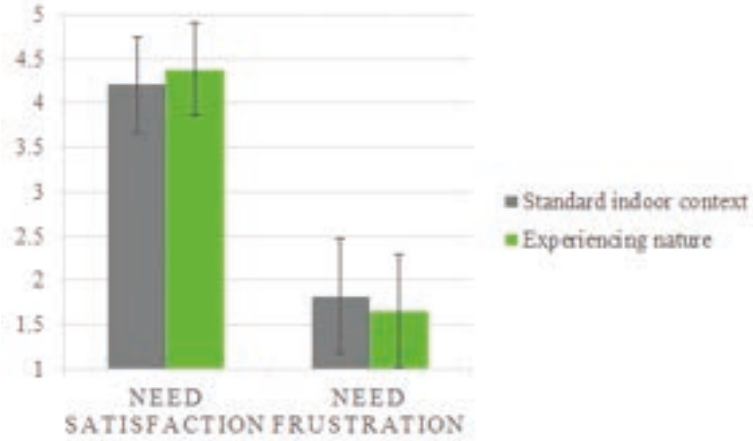


Figure 2. Means with error bars (1SD) for need satisfaction and need frustration in the standard indoor context and while experiencing nature.

Table 2. Multilevel regression of the association between experiencing nature as opposed to being in the indoor context and parental need satisfaction and parental need frustration; regression coefficient B with 95% confidence intervals, converted to Cohen's d with 95% CI.

Measurement	Context	B (SE)	95% CI	d (95% CI)
Need satisfaction				
	Standard indoor context (ref)			
	Experiencing nature	0.18 (0.05)	(0.09–0.27) ***	0.28 (0.14–0.43)
Need frustration				
	Standard indoor context (ref)			
	Experiencing nature	−0.18 (0.06)	(−0.3–−0.07) **	−0.24 (−0.4–−0.09)

** $p < 0.01$ *** $p < 0.001$.

DISCUSSION

Having parents in shelters experience nature was associated with higher parental need satisfaction ($d = 0.28$) and lower parental need frustration ($d = -0.24$). This association was especially pronounced for parents with young children.

When comparing the effect size to other self-determination-informed interventions (see Ntoumanis et al. (2020)), the effect of experiencing nature was small. The intervention can, however, be considered promising as the study shows that a single nature experience is associated with improved basic psychological needs. Razani et al. (2018) suggested that repeated visits to natural environments were necessary for a maximal effect on parental wellbeing. Future studies could investigate if more regular nature experiences could further enhance the effect size. Furthermore,

the small effect can be considered as promising because the intervention was directed "only" to the experience of nature. Future studies may combine experiences in nature with other self-determination theory-informed interventions such as goal setting or social support (see e.g., Ntoumanis et al. (2020)) to see if such combination increases the effect size.

The sample that we studied mainly consisted of mothers (91%), as is to be expected with the majority of the participating shelters being women's shelters focusing primarily on female clients. Previous studies have shown that gender affects the relationship between nature experiences and outcome measures. For women, effects of nature experiences were smaller for depressive mood (Roberts et al., 2019) and perceived stress (Razani et al., 2018), and larger for perceived quality of life (Bos et al., 2016), levels of activity (Sang et al., 2016) and self-reported well-being (Sang et al., 2016) than for men. Future studies should include men in shelters to identify the role of gender on the relationship between nature experiences and basic psychological needs.

Transactional-ecological models (Sameroff, 2009) show that parents and children are part of ecological settings that change and are changed by the participants in them in complex interactive processes. Germane to the interpretation of the intervention effect is that the change in physical environment was not only a change in environment in which interactions took place, but that the change in scenery changed the actors (parents, children and professionals) and the interactions between them in a complex manner. These complex interactions make it difficult to understand the pathways between experiencing nature and parental basic needs. An example of a possible pathway is through parents' stronger feelings of affect (McMahan & Estes, 2015) and vitality (Razani et al., 2018; Van den Berg et al., 2016), and lower depressive feelings (Beyer et al., 2014) in nature, which are aspects that Brenning et al. (2017) showed to correlate with parental basic need fulfillment. Another example of a possible pathway is through nature as an interesting play area for children (Norðdahl & Einarsdóttir, 2015) that provides a wide range of play possibilities (Dowdell et al., 2011; Lester & Maudsley, 2007) and in turn allows a range of child behaviors with also room for loud, active or even destructive behavior that parents can otherwise experience as negative child behavior. Not having to evaluate the child's behavior as negative may strengthen parents' feelings of relatedness, competence and autonomy. A third possible pathway is that shelter professionals themselves benefited from the restorative qualities of nature, resulting in, e.g., stress reduction (Tyrväinen et al., 2014), positive emotions (Ballew & Omoto, 2018) or attention restoration (Ohly et al., 2016), which could have changed their professional interactions with the family and so impacted parents' basic psychological need fulfillment. Future research can contribute to forming informed hypotheses on the interactive processes involved.

The association between experiencing nature and parental basic psychological needs was stronger for parents of younger children than for parents of older children. This raises the question whether the natural environments in this research were suitable to support parent–child interactions with children of all ages. When children in higher age groups develop towards self-confidence, peer group membership and autonomy, the demands on the parent changes from being close and available towards indirect monitoring and psychological autonomy granting (Cummings et al.,

2002). The majority of the available natural environments were relatively small and confined (such as a courtyard garden), which were likely not fitting for parent–child interactions with older children.

Contrary to our hypothesis, associations between need frustration and satisfaction and context were not significantly moderated by shelter type. It remains, therefore, unclear to what extent families seeking shelter for acute safety or families who are homeless benefit differently. The fact that professionals chose a nature experience responsive to the families' possibilities and needs may have prevented parents from women's shelters to experience limited promises and larger threats due to their safety issues. This finding may motivate professionals to use nature experiences for parents with safety concerns, given that they do this whilst being responsive to the families' possibilities and needs.

Additionally, contrary to our hypothesis, associations between experiencing nature and need frustration and need satisfaction were not significantly moderated by the parent's nature connectedness. It remains, therefore, unclear to what extent parents with higher or lower nature connectedness benefit differently. This may motivate professionals to use nature experiences for parents with low connectedness to nature just as well as for parents with high connectedness to nature. For the interpretation of this finding, we must consider the low response rate (N = 65), which gives reason to be cautious with interpretation. The low response to this question could be due to the fact that the question was the last of the questionnaire and came directly after the Basic Psychological Need Satisfaction and Need Frustration Scale which professionals reported as challenging on the concentration and emotion of the parents. We advise future research to schedule the INS questionnaire at a separate time point.

For the interpretation of the findings, it is important to note that all data were collected during the fall and winter seasons, which were relatively cold and dark months (with an average temperature of seven degrees Celsius, and nine hours between sunrise and sunset), with relatively dry weather (with an average of 51 mm of rain per month) (KNMI, 2020). Although several studies have suggested that weather conditions can impact the restorative qualities of nature experiences (Connolly, 2013; Hartig et al., 2007), little is known about the impact of weather on the restorative qualities of nature for parental need satisfaction specifically. Future studies may use a variety of weather conditions to identify if and to what extent these can impact the results.

Sources of Potential Bias

The selection of participants is a potential weakness in the study design. Firstly, it is possible that selection bias occurred with professionals selecting the parents that they expected to benefit from a nature experience. Secondly, we did not have information regarding the number and characteristics of parents who were eligible for participation but not approached, nor the number and characteristics of parents that dropped out in the informed consent procedure, which makes it impossible to assess if parents who participated differed from eligible participants. This forms a threat to the generalizability of the study results.

This study used a variety of natural environments. Although studies have reported on physical characteristics that make a natural environment higher or lower in quality for different outcome measures [42–44] and suggestions have been made for the design of natural environments in care facilities specifically (Bengtsson & Grahn, 2014; Lygum et al., 2019; Memari et al., 2017), little is known on the physical characteristics of natural environments for supporting parental basic psychological needs. This lack of insight in supportive physical characteristics for parental basic psychological needs makes it difficult to assess and reflect on the quality of nature used in this study. Future research should focus on identifying physical characteristics of environments that support parental needs, to help future study design as well as practice.

This study used a variety of nature experiences, individualized for each parent and their family. Generalizing the study results to nature experiences of other parents must be done with caution.

This study is a field experiment in a natural setting, which gives ecological validity as well as limitations in the number of variables under control by the researcher. Future research should use more controlled research designs.

Conclusions

Findings suggest that the physical environment matters for parents' basic psychological need fulfillment as they interact with their children in the context of sheltering. This finding opens a potential avenue for supporting parental functioning and resilience in the face of risk if these effects were to be replicated across settings using controlled experimental designs. At the very least, the findings may be discussed with practitioners and parents in the context of making shelter life and work more conducive to mental health and family functioning.

APPENDIX A

Table A1. Natural Environments Used for Experiencing Nature.

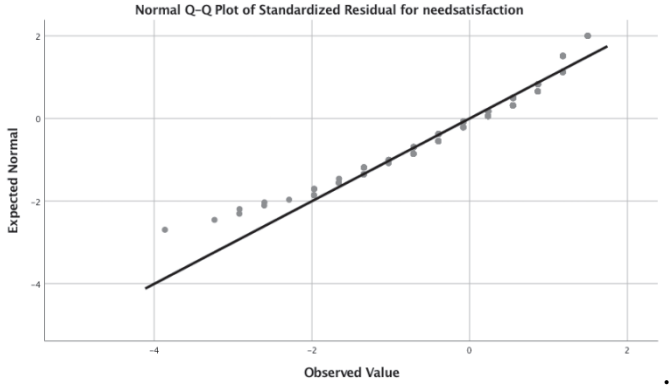
Environment	*N* Cases
Garden on the shelter property	48
Neighborhood green	35
Children's farm	24
Park	22
Indoor nature (e.g., visiting pets in the shelter living space, an interior garden)	11
Natural playground	10
Forest	9
Beach	1

Table A2. Potential Effect Modifiers: Estimates of Fixed Effects with Standard Error, 95% Confidence Interval and Significance.

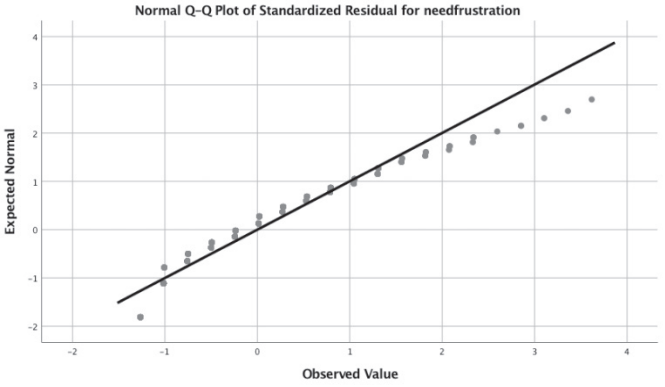
Effect modifiers tested	**Need Satisfaction**			**Need Frustration**		
	B (SE)	**95% CI**	**Sig.**	**B (SE)**	**95% CI**	**Sig.**
Standard indoor environment (Ref)						
Experiencing nature	0.12 (0.15)	−0.18–0.42	0.42	−0.17 (0.19)	−0.55–0.21	0.38
Sequence effect	0.23 (0.16)	−0.1–0.56	0.17	−0.015 (0.21)	−0.43–0.4	0.94
Sequence effect interaction term	−0.04 (0.09)	−0.22–0.14	0.68	0.01 (0.12)	−0.22–0.24	0.94
Standard indoor environment (Ref)						
Experiencing nature	0.16 (0.11)	−0.07–0.38	0.16	−0.13 (0.15)	−0.42–0.15	0.36
Type of shelter	0.12 (0.13)	−0.13–0.37	0.34	−0.15 (0.17)	−0.47–0.18	0.38
Type of shelter interaction term	−0.02 (0.07)	−0.16–0.12	0.82	0.03 (0.09)	−0.15–0.21	0.72
Standard indoor environment (Ref)						
Experiencing nature	0.36 (0.09)	0.18–0.54	0.00	−0.42 (0.12)	−0.65–−0.19	0.00
Age of the child	−0.08 (0.02)	−0.13–−0.03	0.00	0.09 (0.03)	0.03–0.15	0.00
Age of the child interaction term	0.04 (0.01)	0.01–0.07	0.01 *	−0.04 (0.02)	−0.08–−0.01	0.02 *
Standard indoor environment (Ref)						
Experiencing nature	0.09 (0.16)	−0.24–0.41	0.6	−0.48 (0.24)	−0.95–−0.01	0.05
The parent's connectedness to nature	0.14 (0.07)	0.01–0.28	0.03	−0.23 (0.09)	−0.2–0.16	0.79
The parent's connectedness to nature interaction term	−0.02 (0.04)	−0.1–0.05	0.51	−0.06 (0.05)	−0.16–0.05	0.29

* $p < 0.05$.

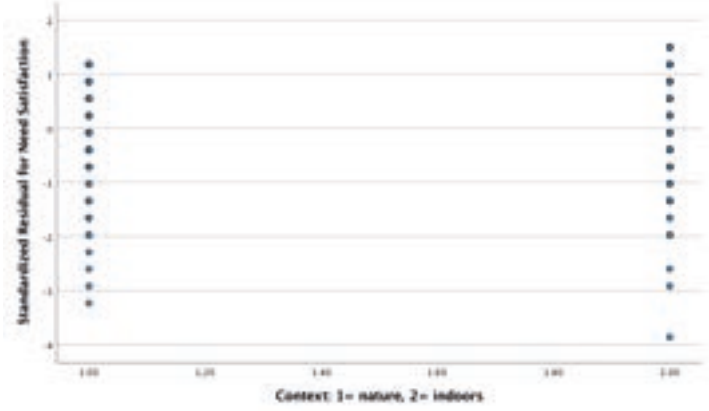
APPENDIX B



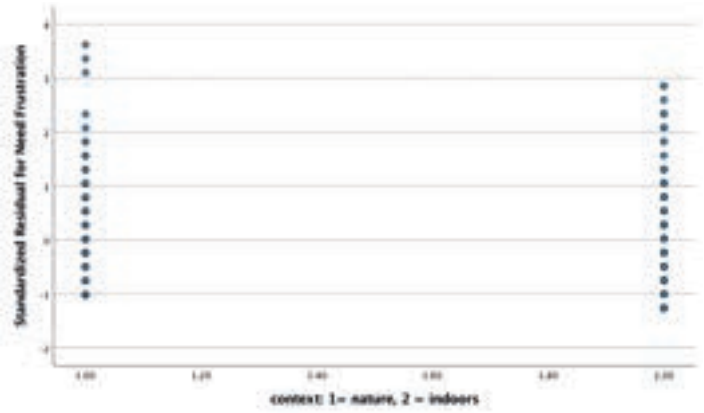
Q–Q Plot of the Standardized Residuals for Need Satisfaction



Q–Q Plot of the Standardized Residuals for Need Frustration



Scatter Plot of the Variation of Standardized Residuals for Need Satisfaction per context



Scatter Plot of the Variation of Standardized Residuals for Need Frustration per context

Figure A1. Q–Q Plots of the Standardized Residuals, and Scatter Plots of the Variation of Standardized Residuals for the Two Contexts. (a) Q–Q Plot of the Standardized Residuals for Need Satisfaction. (b) Q–Q Plot of the Standardized Residuals for Need Frustration. (c) Scatter Plot of the Variation of Standardized Residuals for Need Satisfaction per context. (d) Scatter Plot of the Variation of Standardized Residuals for Need Frustration per context.

Chapter 3.
A Single Case Experiment

Exposure to a natural environment to improve parental wellbeing in parents in a homeless shelter: A multiple baseline single case intervention study

Published as

Peters, E., Hovinga, D., Maas, J., & Schuengel, C. (2021). Exposure to a natural environment to improve parental wellbeing in parents in a homeless shelter: a multiple baseline single case intervention study. *Journal of Social Distress and Homelessness*, 1-12. https://doi.org/10.1080/10530789.2021.1995937.

The results of this study have been shared via

- Presentation for participating parents and shelter professionals at *location concealed* on December 3rd 2019.

- Keynote speech at 'Huisje Boompje Beestje' Closing Conference organized by Valente Branchevereniging voor Opvang en Stichting Kinderpostzegels on November 30rd 2020.

- Factsheet, sent to all shelters that participated in the studies in this dissertation:

  Van den Bogerd, N., Peters, E., & Hovinga, D. (2021). Huisje Boompje Beestje: Hoe natuur de kwaliteit van de vrouwen- en maatschappelijke opvang voor kinderen kan versterken. Factsheet can be retrieved from: https://www.hsleiden.nl/binaries/content/assets/hsl/lectoraten/natuur-en-ontwikkeling-kind/factsheet-huisjeboompjebeestje.pdf

Characteristics of a place can contribute to parents' wellbeing and their ability to fulfil their roles as parents. Places can support parents when parents feel safe in that place, when parents perceive control over and engagement with the place, and when there is enough space for all family members and their daily activities (Cuellar et al., 2015; Haas et al., 2018; Johnson et al., 2009; Kepper et al., 2019). At the same time, places can be stressors. Chaotic places are linked to increased feelings of helplessness and psychological distress in parents, lower warmth and responsiveness in parenting behavior, and lower self-regulation of family members (Deater-Deckard et al., 2012; Evans & Wachs, 2010; Jocson & McLoyd, 2015; Vernon-Feagans et al., 2016). Overcrowded living spaces can limit the possibility for movement, constrict feelings of agency, and contribute to family conflict (Finno-Velasquez et al., 2017; Haas et al., 2018). Unaesthetic places are believed to evoke feelings of lower self-worth or depression (Haas et al., 2018). For family support and counseling it is important to understand stressors of a place and evaluate interventions aimed for improvement.

For parents who reside in shelters for homeless families their living place can be a stressor (Alleyne-Green et al., 2019). They report stress due to crowded, noisy, and chaotic living quarters (Azim et al., 2019; Pable, 2012; Sylvestre et al., 2018), living 'in the public eye' from a lack of privacy (Azim et al., 2019), sharing space with other parents with differing parenting values (Holtrop et al., 2015), being limited in maintaining familiar routines (Alleyne-Green et al., 2019) and living by rules and routines that are not intrinsically valued (Anthony et al., 2018; Glenn & Goodman, 2015; Mayberry et al., 2014). On top of that, parents have reported that they felt limited in their possibilities for positive interactions with their child because shelter living spaces lack the design and comfort of a home (Walsh et al., 2010; Walsh et al., 2009) and miss safe and engaging play sites for children (Bradley et al., 2018; Walsh et al., 2010). This has consequences for parents' experienced wellbeing. There is thus a need to find ways to support parents in finding and using better suitable physical environments for parenting.

Regular exposure to nature may offer a supportive environment for parents. Exposure to nature may provide opportunities for time away from the stressors of the indoor shelter environment (Varning Poulsen et al., 2020), and at the same time offer experiences that are associated with improved wellbeing (Biedenweg et al., 2017; McMahan & Estes, 2015; Razani et al., 2018). For parents in shelters exposure to nature has been associated with the fulfilment of their basic psychological needs (E. Peters, J. Maas, D. Hovinga, et al., 2020; Elise Peters et al., 2020), which is linked to wellbeing, motivation and engagement (Ryan & Deci, 2017) and has been associated with parental wellbeing and positive parenting practices (Brenning & Soenens, 2017; Brenning et al., 2017; Jungert et al., 2015; Mabbe et al., 2018; Slobodin et al., 2020; Van Der Kaap-Deeder et al., 2019). Exposure to nature may offer an avenue for supporting parents' functioning and resilience while living in shelters. To gain insight in the impact of exposure to nature, controlled studies are needed.

With the current study, we aim to test a proof of principle for the impact of nature exposure on parental wellbeing. Firstly, we aim to determine whether a functional relationship can be observed between exposure to nature and basic psychological need fulfilment of parents. Based on findings in an earlier study (E. Peters, J. Maas, D. Hovinga, et al. (2020) we expected that exposure to nature

would enhance basic psychological need fulfilment of parents, resulting in higher need satisfaction and lower need frustration compared to when exposed to the standard indoor setting of the shelter. Secondly, we aim to determine whether a functional relationship can be observed between exposure to nature and determinants of overall wellbeing of the parent, namely satisfaction with life and affective state. Based on McMahan and Estes (2015), we expected that exposure to nature would enhance parents' affective state, resulting in higher positive affect and lower negative affect. Based on Biedenweg et al. (2017) we expected that exposure to nature would enhance parents' overall satisfaction with life.

METHOD

Design

We conducted a repeated single case experiment (see Kazdin (2020); Kratochwill et al. (2013); Onghena (2005)) which involved repeated and randomized exposure to the indoor environment of the shelter and exposure to nature, and an assessment of a simultaneous change in the dependent variable. Dependent variables were basic psychological need fulfilment in parenting, affective state of the parent, and parents' satisfaction with life. The study report was based on SCRIBE reporting guidelines (Tate et al., 2016).

The effect of exposure to nature on basic psychological need fulfilment in parenting, affective state, and satisfaction with life was tested using an 8-day multiple baseline experimental design. Measurements were taken during a baseline phase (Phase A) and an intervention phase (Phase B). During Phase A at least three repetitions of a baseline measurement in the standard indoor condition of the shelter were conducted in order to gauge daily variation in basic psychological need fulfilment in the dependent variable, as well as possible trends preceding exposure to nature. During Phase B, the manipulated variable 'nature exposure' was introduced. The single case experiment was conducted with three families.

To increase the internal validity of the study the start point of the intervention was randomized using the Single-Case Randomization Test package (Bulté & Onghena, 2013), resulting in an arrangement where Phase B started on day 4 for family 1 (AAABBBBB), on day 5 for family 2 (AAAABBBB), and on day 7 for family 3 (AAAAAABB).

Participants

The study took place in a Dutch shelter for families who became homeless due to financial problems. At the time of the study, they housed 21 families which is their full capacity. The aim of the shelter was to provide a temporary home and support families in finding permanent housing. Inclusion criteria were being a parent, living with at least one child in the shelter for the duration of the study, and taking care of the child during data collection hours. Families were excluded from participation when families were assessed as a risk to the researcher's safety, for example due to

problems in anger management. Three families were selected (see Figure 1). Table 1 shows the characteristics of the participating families.

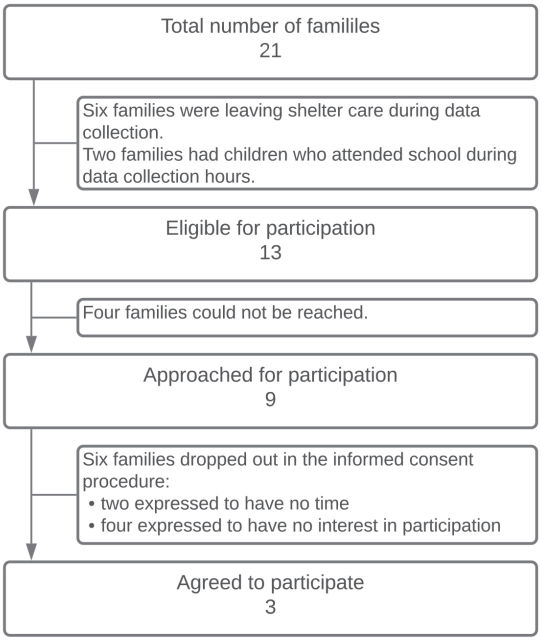


Figure 1. Participant recruitment

Table 1. *Participant characteristics*

Family composition	Migration background and reason for shelter care	Supply of care
One parent (F) (25-30Y), two children (1-3Y)	Refugees with a permanent residence permit for the Netherlands. In shelter care due to homelessness after divorce.	The shelter supported the family in finding a permanent home and provided welfare work on request. The local government supported the family with the application for benefit and with lessons in Dutch.
Two parents (M/F) (25-30Y and 15-20Y), two children (1-3Y). Father was the participant	First generation immigrants. In shelter care due to homelessness after home eviction for financial reasons.	The shelter supported the family in finding a permanent home and provided help with administrative tasks such as the application for benefit and arranging health care insurance. The national administrative authority commissioned by the Ministry of Social Affairs and Employment supported the father in finding employment.
One parent (F), (25-30Y), two children (1-3Y)	Refugees whose application for asylum is denied. In shelter care pending several court decisions.	The family got social work from the shelter, pro deo legal advice from a law firm, and an allowance from a charity fund. The family received no government support.

Procedure

A researcher visited the family daily for one hour. During phase A the family carried on as usual, during phase B the researcher arranged personalized exposure to a natural environment. After the one hour visit and during exposure a research assistant conducted a telephone interview with the participant to assess the parent's need satisfaction, need frustration, and satisfaction with life. After the one hour visit the researcher filled out a questionnaire on the parent's subjective affective state.

Blinding

Families were informed that the study was conducted to get insight in fluctuations in parental wellbeing for families in shelters. Families knew that a researcher would observe their daily activities and at moments also suggest activities. Families were naïve to specific hypotheses on the effects of nature exposure. Each family was debriefed after data collection.

The telephone interview was conducted by a research assistant who was naïve to the goal and design of the experiment. The data from the telephone interview was inaccessible to the researcher who conducted the experiment. The researcher who conducted the experiment was not naïve to the aim of the study. To blind her from insight in the development of the parent's subjective affective state, she handed the raw data in daily and had no instructions on how to calculate totals.

Procedural fidelity

The experiment was supervised by a coordinating researcher who kept in daily contact with the researcher who conducted the experiment to assess whether the study was implemented as intended throughout the duration of the experiment. On day 2 with Family 1 (Phase A), the children were not present during the researcher's visit. No measurements were conducted, and the procedure was postponed one day. The research was otherwise implemented as intended.

Measures

Basic psychological need fulfilment in parenting

Daily ups and downs in Basic psychological need fulfilment in parenting were assessed using the Dutch parenting version (Brenning & Soenens, 2017) of the validated Basic Psychological Need Satisfaction and Need Frustration scale (Chen et al., 2014) adapted for daily administration (Brenning et al., 2017). The questionnaire contains six statements on daily satisfaction of the basic psychological need of relatedness (e.g. "Today, I felt connected with my child"), competence (e.g. "Today, I felt confident in what I did for my child"), and autonomy (e.g. "Today, I felt a sense of choice and freedom in the things I did with my child"), as well as statements on the frustration of the basic need of relatedness (e.g. "Today, I felt a distance between my child and me"), competence ("Today, I felt insecure about my abilities with my child") and autonomy (e.g. "Today, I felt forced to do things for my child I did not choose to do"). Items were rated on a scale from 1 (completely not true) to 5 (completely true). Total scores were created by calculating the average of the scores on the six items for need satisfaction and the average of the six items for need frustration. Previous studies with this questionnaire (Brenning & Soenens, 2017; Mabbe et al., 2018; E. Peters, J. Maas, D. Hovinga, et al., 2020) reported a Cronbach's alpha between .72 and .83 for need satisfaction, and between .70 and .81 for need frustration.

Wellbeing

The study used two measurements for wellbeing, one based on self-report by the parent and one based on alter report by the researcher, aiming to reduce response bias.

Satisfaction with Life (self-report). Daily satisfaction with life was assessed using one item from the Satisfaction with Life Scale (SWLS) (Diener et al., 1985), in the shortened version and modified for daily administration (Maher et al., 2015). Participants answered the question: "I was satisfied with my life today" by rating it on a scale from 0 (strongly disagree) to 100 (strongly agree). This question refers to the person's internal, subjective assessment of their summarized overall quality of life. Previous studies with the complete SWLS reported a Cronbach's alpha of between .79 and .89 (Pavot & Diener, 2009). The single item used here was the highest loading item in factor analysis of the complete 5-item SWLS (pattern coefficient = .90) and can be used for measuring daily state (ICC = 40% between-person variance) (Maher et al., 2013).

Affective state (alter report). Daily affective state of the parent was measured with the Dutch version of the Positive and Negative Affect Schedule (PANAS) (Peeters et al., 1996), consisting of ten adjectives on Positive Affect (active, alert, attentive, determined, enthusiastic, excited, inspired,

interested, proud, strong) and ten adjectives on Negative Affect (afraid, ashamed, distressed, guilty, hostile, irritable, jittery, nervous, scared, upset). The researcher indicated her perception of the parent's current affective state after a one-hour visit. The researcher rated the items on a 5-point unipolar response scale from 1 (very slightly or not at all) to 5 (very much) for the question "to what extent you think he / she feels this way right now?". Total scores for positive and negative affect were created by summing the respective items. Previous studies with this questionnaire (Díaz-García et al., 2020; Merz & Roesch, 2011) report a Cronbach's alpha of between .91- .92 for Positive Affect and between .87 - .88 for negative affect, and sensitivity to change (Díaz-García et al., 2020).

Intervention

Baseline

During phase A the family carried on as usual. Baseline measurements were conducted while the family was exposed to the indoor setting of the shelter. The indoor setting consisted of a private bedroom with bathroom for the family (measuring 15 – 20 m2) and two common living rooms and two common kitchens shared with 21 families. All measurements were conducted in the morning between 10 and 12 A.M. For all participating families this was the time to start the day with getting dressed, preparing breakfast while the children were playing in the common kitchen, and eating. If the family had spontaneously sought exposure to nature at some point during a baseline day, no measurement would have been conducted, which did not occur.

Intervention

The researcher arranged exposure to nature for the family. Nature exposure was personalized by choosing a suitable form for the particular family at that moment (e.g. when the parent expressed tiredness she suggested to sit on a bench close to the shelter, when the children expressed enthusiasm for football she suggested to play football). Nature exposure consisted of interacting with elements of nature (such as playing with sand and water, or gardening), or perceiving elements of nature (such as listening to bird song, or viewing nature).

The shelter was located in an urban area and had a garden measuring about 500 m2 with a vegetable garden, rabbits, chicken, a climbing frame, a sandpit, a greenhouse, a sitting area, and a biking area. Adjacent to the shelter garden was a public walking path through allotment gardens (approx. 50,000 m2) and a natural playground (approx. 600 m2) with a sandpit, a water pump, a tree hut, swinging ropes, and a sitting area.

The researcher exposed the family to nature during their usual morning routine, e.g. by going outdoors before or after breakfast, or while breakfast was in the oven. For family 1 the exposure to nature consisted of feeding the pet rabbits, free play in the natural playground, watching fish in a pond in the allotment gardens, and gardening in the shelter greenhouse. For family 2 the exposure to nature consisted of playing rough and tumble in the shelter garden, feeding the pet rabbits, gardening in the shelter greenhouse, and chasing a wild rabbit through the allotment gardens. For family 3 the exposure to nature consisted of walking through the allotment gardens,

free play in the natural playground, and looking at horses, pony's, goats and rabbits in the field adjacent to the allotment gardens.

Researcher characteristics

The researcher (female, 52Y) who conducted the experiment had experience in working with children from her background as a preschool- and primary school teacher and worked at the time of the study as a teacher in child development and parenting at a university of applied sciences and as a junior researcher in environmental child psychology. She took a two-year training program in outdoor living and learning preceding this study.

Weather conditions on intervention days

Weather reports (Meteovista, 2019) showed that exposure to nature took place during rainy days (chance of rain in percentages M = 80.9, SD = 32.2) with windiness (wind force in Beaufort M = 4, SD = 1.1) and mild temperatures (temperature in degree Celcius M = 17.9, SD = 1.4). There were no significant differences between weather conditions during baseline days and intervention days (the randomization test's p-value = .69 for temperature, p = .43 for rain change, p = .52 for windiness).

Ethics

Families were approached for participation by their own care professional. After their informal approval parents were introduced to the researcher. Parents received information regarding the study in writing and information on their rights as participants both in written text and in pictograms. An informed consent form was read out loud and discussed. An interpreter in the families' native tongue was available over the phone during this process and was used when necessary. After signing the consent form, a copy of the consent form was given to the parents for their records. Ethical approval was obtained from the Research Ethics Committee of our institute.

Analyses

Data were visually analyzed using the Single-Case Data Analysis Package (De Kumar, 2020). A first impression was obtained with a graphical representation of the data. Mean scores were calculated to detect a possible shift in means between Phase A and Phase B. Range bars and trended range lines were visualized to illustrate the variation in the data. When visual analysis of the data indicated an effect of the intervention, the statistical significance of the intervention effect was evaluated using a randomization test (Bulté & Onghena, 2009). First, the test statistic was calculated by measuring the absolute difference between the mean of Phase A and Phase B. Second, the total number of possible assignments was calculated using

$$N! \prod_{i=1}^{N} k_i$$

with N as number of units and k_i as possible start points for the i-th unit (Bulté & Onghena, 2009). The current design yielded 750 possible randomizations. We tested the null hypothesis (that there

was no effect of the intervention) by calculating the test statistic for every possible permutation of the data. Then a *p*-value was calculated from the proportion of test-statistics that exceeded or equaled the observed test statistic. To calculate the effect size, we used pooled standardized mean difference, as well as the percentage of data in the treatment phase that was higher (or lower, following hypothesis) than the median of the baseline phase, and the percentage of non-overlapping data between baseline and treatment phases.

RESULTS

Basic psychological need fulfilment in parenting

The data is plotted for visual representation. The visual analyses of the mean scores (Figure 2 and 3) shows higher mean scores in Phase B (intervention) than in Phase A (baseline).

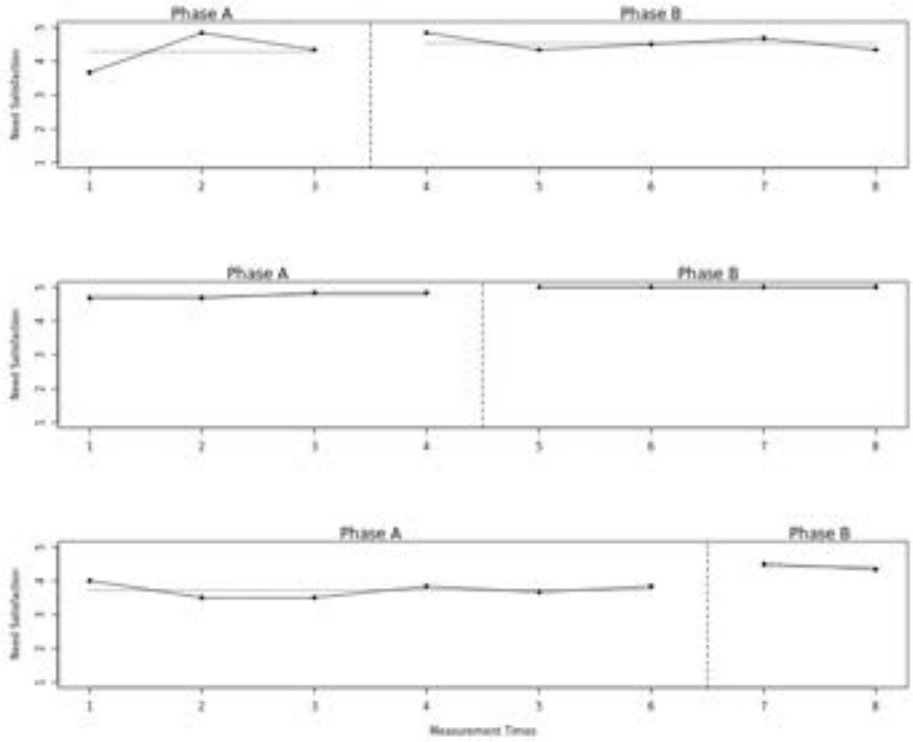


Figure 2. *Visual representation of the data collected in Phase A (baseline) and Phase B (intervention) on need satisfaction with mean levels for both phases.*

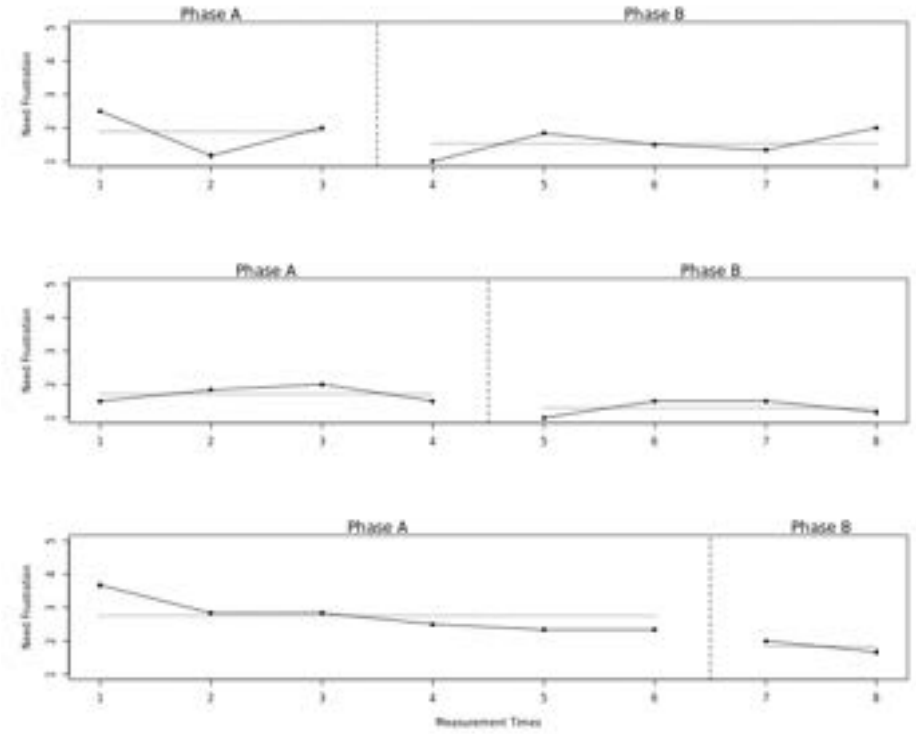


Figure 3. *Visual representation of the data collected in Phase A (baseline) and Phase B (intervention) on need frustration with mean levels for both phases.*

Table 2 shows the test statistic measured as the absolute difference between the phase means, the effect size measured by standardized mean difference, and the percentage of the data that was higher or lower (following hypotheses) in the experimental phase than the median of the baseline phase (PEMscores), the percentage of non-overlapping data between all baseline versus all treatment datapoint comparisons (NAPscores) for each of the outcome measures. As expected from visual analysis, nature exposure enhanced need satisfaction and reduced need frustration. The effect sizes were medium (Parker & Vannest, 2009). The effect of nature exposure on need satisfaction was statistically significant ($p < 0.01$). The effect of nature exposure on need frustration was non-significant ($p > 0.05$). A general p-value for need fulfilment was calculated by statistically combining the p-values for need frustration and need satisfaction. The combined p-value for need fulfilment was significant ($p < 0.05$).

Table 2. Test statistics (measured as the absolute difference between the phase means), effect sizes (measured by standardized mean difference), PEMscores (the percentage of the data that was higher or lower -following hypotheses- in phase B than the median of phase A), NAPscores (the percentage of non-overlapping data between all phase A versus all phase B datapoint comparisons), the randomization test's p-values, and combined p-values.

Outcome	Test statistic	Effect size	PEMscores	NAPscores	The randomization test's p-value	Combined p-value
Need satisfaction	0.4	2.16	86%	0.88	0.008**	
Need frustration	-0.56	-1.34	93%	0.86	0.056^{ns}	
						Combined p-value for need fulfilment in general = 0.004**
Positive affect	3.41	0.62	65%	0.7	0.432^{ns}	
Negative affect	3.57	-1.26	85%	0.81	0.536^{ns}	
						Combined p-value for affect in general = 0.57^{ns}
Satisfaction with Life	2.97	-0.12	20%	0.49	0.4^{ns}	

ns = non-significant
**$p < .01$

Affective state

The visual analyses of the mean scores (Figure 4-5) suggested lack of replicable changes between Phase A and Phase B for positive affect, and a small negative change between Phase A and Phase B for negative affect.

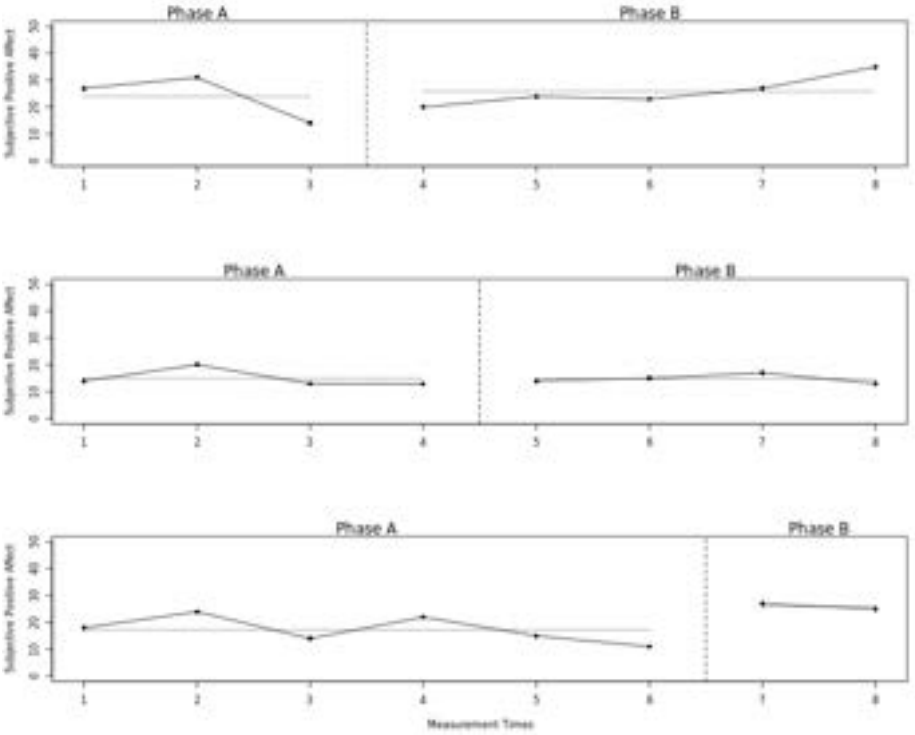


Figure 4. Visual representation of the data collected in Phase A (baseline) and Phase B (intervention) on subjective positive affect with mean levels for both phases.

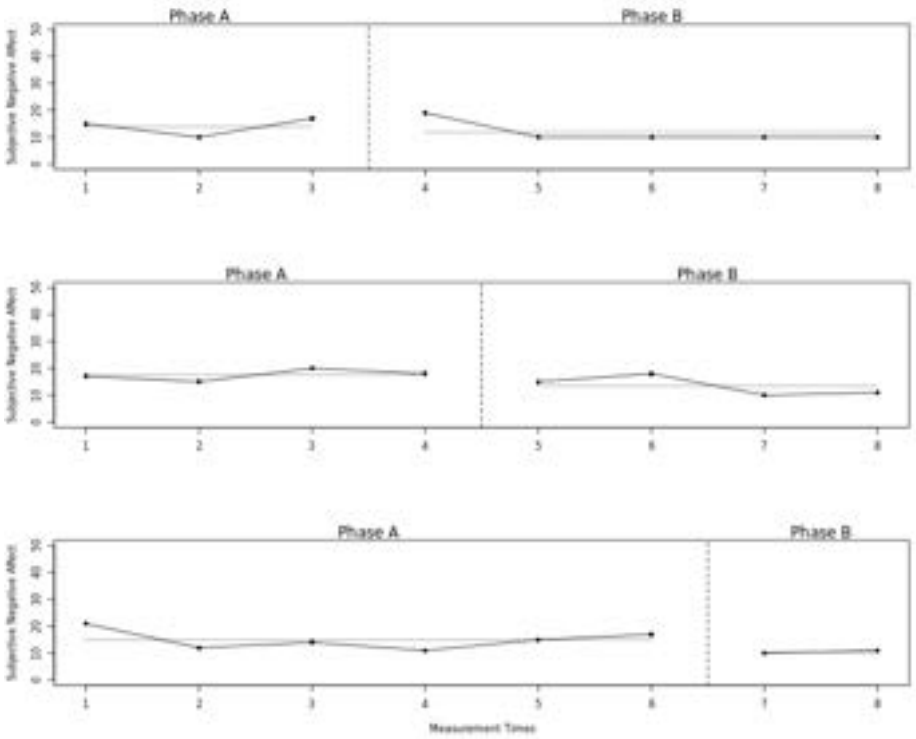


Figure 5. *Visual representation of the data collected in Phase A (baseline) and Phase B (intervention) on subjective negative affect with mean levels for both phases*

Table 2 shows the test statistic measured as the absolute difference between the phase means, the effect size measured by standardized mean difference, and the percentage of the data that is higher or lower (following hypotheses) in the experimental phase than the median of the baseline phase, for each of the outcome measures. As expected from visual analysis, the effect of nature exposure on positive affect and negative affect is not consistent (Table 2) and the effects were non-significant ($p > 0.05$).

Satisfaction with life

The visual analyses of the mean scores (Figure 6) suggested no consistent changes between Phase A and Phase B for satisfaction with life, with the parent of family 1 reporting higher scores during intervention, the parent of family 2 reporting lower scores during intervention, and the parent of family 3 reporting no change.

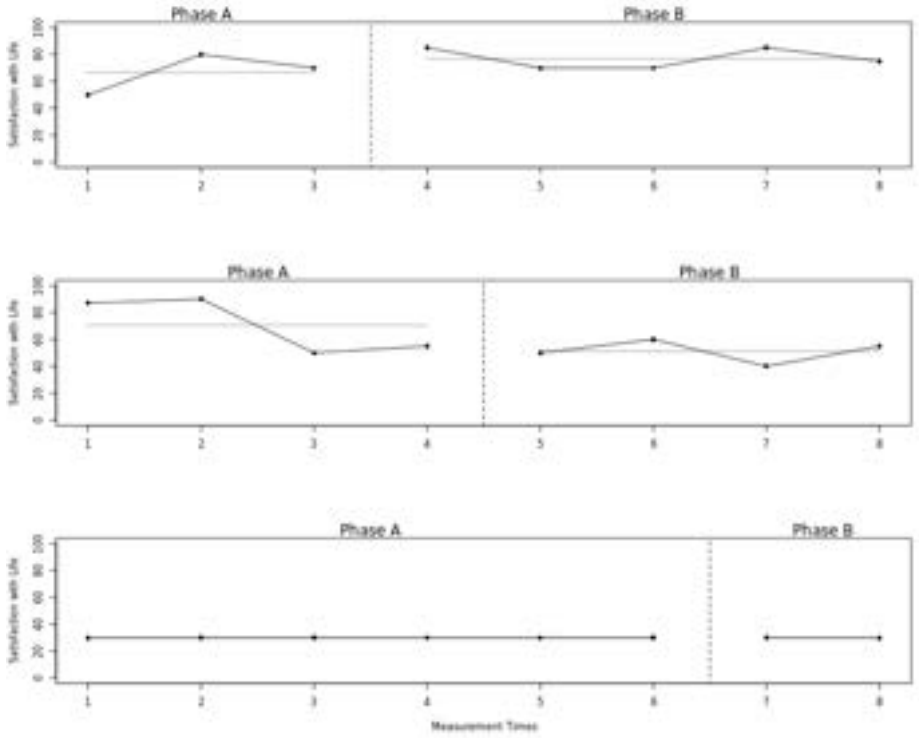


Figure 6. *Visual representation of the data collected in Phase A (baseline) and Phase B (intervention) on satisfaction with life with mean levels for both phases.*

Although visual analysis indicated no effect, we chose to perform all planned analyses for comprehensiveness. As expected from visual analysis, the effect of nature exposure on satisfaction with life is contrary to what we hypothesized. Nature exposure did not enhance satisfaction with life (Table 2). The effect of nature exposure on satisfaction with life was non-significant ($p > 0.05$).

DISCUSSION

This study tested a functional relationship between nature exposure and enhanced feelings of basic psychological need fulfilment in parenting and overall wellbeing for parents in shelters. In line with our hypothesis, exposure to nature significantly affected basic psychological need fulfilment. Our hypothesis was based on reported associations between nature exposure and psychological need fulfilment (E. Peters, J. Maas, D. Hovinga, et al., 2020). When testing this hypothesis in an experimental design, focusing on the level of individuals rather than groups, and with randomization to minimize the impact of potential confounders, the hypothesis was accepted.

Contrary to hypothesis, we found no effects of nature exposure on the outcome measures for overall wellbeing, to wit, affective state and daily overall satisfaction with life. Our hypothesis was based on reported associations between nature exposure and improved wellbeing (Biedenweg et al., 2017; McMahan & Estes, 2015) and on reported links between fulfilment of the basic psychological needs and overall wellbeing (Brenning et al., 2017; Ryan & Deci, 2017). The lack of replicable effects can be understood when we consider the major life changes that characterize the lives of shelter clients. As an example, we were informed that one participant was assigned a permanent home (family 1, day 6), one participant lost a court case (family 3, day 5), and one participant lost a paid job (family 2, day 1), and received news on family members' imminent forced eviction (family 2, day 1). Even these more major live events did not show a clear up or down in the wellbeing measures, which tempers expectations on the sensitivity of these measures for the impact of nature exposure.

For the interpretation of the results, it must be noted that the weather conditions on intervention days were quite poor, with much rain (rain chance in percentage M = 80.9, SD = 32.2) and windiness (wind force in Beaufort M = 4, SD = 1.1). Even though preconditions for wet weather conditions were met by using rain boots, umbrellas and sheltering places, weather conditions may have negatively impacted the restorative qualities of being outdoors (Connolly, 2013; Hartig et al., 2007). Future studies may be conducted under weather conditions that may be more conducive to wellbeing than rain (Brooks et al., 2017), to test the impact of weather on the effect of nature exposure.

The supply of care was quite basic in this shelter, with no daytime activities for parents or children. It is possible that the findings on basic psychological need fulfilment in parenting are attributed to participating in a daytime activity rather than nature exposure. We advise future studies to compare nature exposure to other family activities to see if the results are attributed to doing any activity that breaks standard routine or to nature activities specifically.

Implications for practice

In an earlier study professionals expressed expectations on the benefits of nature for parenting (Elise Peters et al., 2020). This was tested in this study by facilitating engagement with nature, showing how it impacted the three participating parents. The study results are encouraging for trying out integrating exposure to nature to enhance support for parents. To be able to choose a suitable form of nature exposure for a family it may be helpful to develop a repertoire of nature activities and to use professional sensitivity to personalize these for a particular family at a particular moment. The study also demonstrates how single case experiments can be integrated in child and family welfare practice, using systematically collected evidence to enhance individualized support.

Strengths and limitations

The design of a repeated single case experiment allowed a study in a real-life context through its flexible design and limited scale, while minimizing the impact of potential confounders by using

standardized procedures and principles of randomization. However, confidence in the effects of nature will be enhanced by replicating the effects in additional cases and settings (Kazdin, 2020).

The study was conducted in the natural setting of a shelter and no manipulations to the physical environments were done, which contributes to the ecological validity. Future research is needed to test effectiveness when exposure to nature is implemented with existing shelter staff.

During data collection participants were naive for the research question and hypotheses, but the researcher who assessed parents' affective state was not blind. The wellbeing measures based on researchers' assessment showed the same result as the wellbeing measures based on self-report by the parents, which give limited reason to assume researchers' bias.

Conclusion

This study showed that basic psychological need fulfilment could be enhanced in parents by facilitating exposure to nature. Exposure to nature did not significantly influence overall wellbeing of the parents. When aiming to contribute to parents' functioning and resilience, professionals in homeless shelters can invite families for nature exposure for the support of parents' basic psychological need fulfilment.

Chapter 4.
A Case Narrative Study

Social workers' theories-in-use for choosing nature activities for the support of parents in shelters

A revised version of this article is published as

Peters, E., Hovinga, D., Maas, J., & Schuengel, C. (2022). Social Workers' Choice Making in Supporting Nature Activities by Parents and Children in Shelters. *Frontiers in Psychology, 13*. https://doi.org/10.3389/fpsyg.2022.891419.

The results of this study have been shared via

- Presentation at Conference of the International Association for People-Environment Studies (IAPS) in Lisbon, Portugal, June 2022.
- Poster for the professional workplace, sent to all shelters that participated in the study:

  Peters, E. (2022). Ouders ondersteunen met natuuractiviteiten: hoe kies je een natuuractiviteit? Poster can be retrieved from https://www.hsleiden.nl/binaries/content/assets/hsl/lectoraten/natuur-en-ontwikkeling-kind/buitenboosters/hbb_a2.pdf
- Guide for methodical working with nature in shelters:

  Van den Bogerd, N., & Peters, E. (2021). Natuur in de methodische begeleiding van kinderen in de opvang. Film can be retrieved from https://www.hsleiden.nl/natuur-en-ontwikkeling-kind/onderzoek/natuur-in-de-vrouwen-en-maatschappelijke-opvang/huisje-boompje-beestje.
- Mini-lecture for Leiden European City of Science 2022, May 15th 2022:

  Joven, M., & Peters, E. (2022). Spelen in het Singelpark. Film can be retrieved from https://leiden2022.nl/activiteiten/spelen-het-singelpark
- Team training sessions for shelter professionals at Perspektief de Haven on April 11th 2022, at Perspektief de Terp on April 19th 2022, and at HVO Querido on May 3rd 2022, by the Outdoor Living and Learning Academy, Hogeschool Leiden.

Shelters provide a temporary living place for families when they are homeless or when they are unsafe due to threat or abuse. Shelters provide physical safety and shelters professionals offer psychological support, arrange work and finances, and help families obtain permanent independent housing, aiming for a return to independent family functioning (Council of Europe, 2011; *Lisbon Declaration on the European Platform on Combatting Homelessness*, 2021). Notwithstanding these efforts, shelter life can also bring stressors to parental functioning that can impede independent family life. Parents have reported noise and chaos in the shelter living spaces, imposed shelter rules that do not match with parents' own rules and routines, experiences that reduced self-esteem in their parental role, challenges to parental mental health, lack of material resources for parenting, and issues with stigma and negative stereotypes of homeless parents, that bring challenges to maintaining parents' wellbeing, household routines and family functioning (Anthony et al., 2018; Bradley et al., 2018; Glenn & Goodman, 2015; Pable, 2012; Sylvestre et al., 2018). It is important that shelter organizations find ways to make shelter experiences beneficial or at least not adverse to parental functioning.

For parents in shelters the visiting of a natural environment such as a garden, forest, children's farm, or park can be supportive. Studies in shelters as well as in other living places have indicated that natural environments near a family's living place can be used as a safe and engaging place for family activities, where parents can find fun and unconstrained ways to interact with their children (Ashbullby et al., 2013; Cameron-Faulkner et al., 2018; Izenstark et al., 2016; Izenstark et al., 2021; Kotozaki, 2020; Millican et al., 2019; E. Peters, J. Maas, C Schuengel, et al., 2020; Rantala & Puhakka, 2020; Varning Poulsen et al., 2020). Such positive moments in nature are associated with stress reduction in parents (Kotozaki, 2020; Razani et al., 2018) and responsive interactions between parent and child (Cameron-Faulkner et al., 2018). For parents in shelters specifically, experiences in a natural environment have been associated with parents' experiences of connectedness with their child, autonomy in making parenting decisions, and competence in their parenting practice (Peters, Hovinga, et al., 2021; E. Peters, J. Maas, D. Hovinga, et al., 2020; E. Peters, J. Maas, C Schuengel, et al., 2020). These findings suggest that professionals may use engagement with nature to support parents in shelters.

Several shelters have integrated nature in their practice to support parents' functioning and resilience (Lygum et al., 2019; Millican et al., 2019; Norton et al., 2020; E. Peters, J. Maas, D. Hovinga, et al., 2020; E. Peters, J. Maas, C Schuengel, et al., 2020; Renzetti et al., 2014; Varning Poulsen et al., 2020) such as by offering seasonal celebrations in nature, walk and talk therapy, outdoor adventure experiences, therapeutic horticulture, or outdoor play moments. Thus far, little is known about how professionals choose nature activities for the support of parents. If helping families to engage with nature is to be part of professional skills and training, description and understanding is needed of theories that professionals might implicitly or explicitly rely on, when determining whether a nature activity may be good for a family.

The current study was aimed to describe professional theories-in-use for facilitating nature activities for the support of parents. A theory-in-use is a tacit or explicit frame that professionals use when making daily practical decisions, and can be described with the formula: "in situation S, if you want to achieve C, do A" (Argyris & Schon, 1974). Our interest lies in understanding professional theories-in-use for choosing nature interventions for the support of parents, by answering the question: "When social workers facilitate a nature intervention for a family in their care (S), with the intention to support parents (C), what choices do professionals make (A)?". A theory-in-use can best be constructed on observations of the actual behavior of professionals, so that the choices they make can be inferred from their actions in practice (Kinsella, 2010; Ryle, 2009; Schön, 2017). To collect data on the actual behavior of professionals, Argyris and Schon (1974) emphasized the use of case narratives, written by professionals according to a common format that focusses on detailed descriptions of actual actions of the professional and the behavior of their client. In this study, we collected and analyzed case narratives that shelter professionals wrote about parenting supportive nature activities that they facilitated for families under their care.

METHOD

Participants

This study included 99 shelter professionals who worked in child and family social work in a shelter for homeless families or in women's shelters in the Netherlands during the study period (October 2018 until February 2019). The shelter professionals were selected from 20 shelters that participated in a Dutch nationwide project aimed to enhance the wellbeing of families in shelters through the development and use of natural environments. One year prior to data collection, each shelter had received funding for the design and landscaping of natural places. Each shelter developed a restorative garden, a natural play area, a children's farm, and /or a vegetable garden.

Shelter managers were asked to include team members for participation in this study on the basis of being a professionally educated child and family social worker, being motivated to use nature in shelter social work, and being motivated to participate in research. Shelter managers provided the researchers with a list of team members who fitted the inclusion criteria, after which researchers contacted the professionals to inform them about the goal of the study and their rights as participants. Participating professionals signed for informed consent. For the participant flow, see Table 1.

All participating professionals were educated in child and family social work in secondary vocational training, bachelor education, or master education. Their training includes assessing the needs of their clients by listening, questioning, observing, and professionally weighing these sources of information to form a professional judgement, as well as in facilitating activities in the support of their clients, and in critically reflecting on the effects. For participant characteristics, see Table 2. Professionals participated during their regular and paid working hours. Shelters could claim the expenses for professionals' time spent on participation in the research, with a maximum of 32 hours per professional at their hourly rate.

All participating professionals took four training sessions in which they shared ideas for and experiences with nature activities for families under their care and reflected on their practice in conversations with colleagues, with the aim to develop, maintain, and share professional insights on nature activities for parents in shelters. After the second and third training session, data collection took place.

Table 1. *Participant flow*

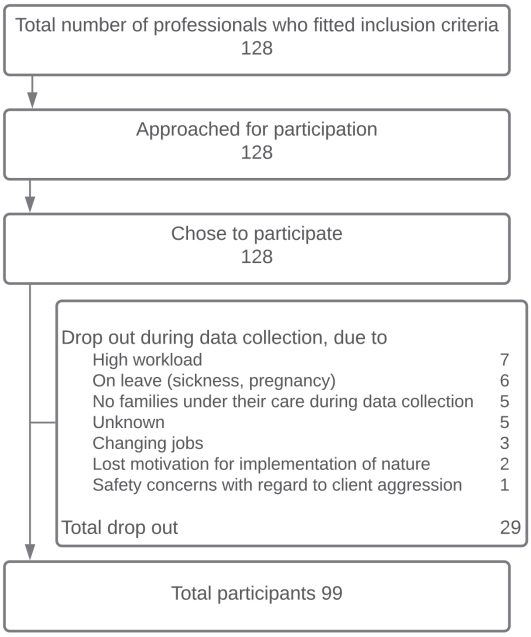


Table 2. *Participant characteristics*

Gender	92 female, 7 male
Position	62 Social worker / case manager / personal coach (educated in BA-education) 32 Group worker / child and youth worker (educated in vocational education) 4 Child and family counselor (educational level unknown) 1 Family therapist (educated in MA-education)
Type of shelter	13 women's shelter 5 shelters for homeless families 2 combined women's shelter/ shelter for homeless families

Case narrative design

We used a case narrative design. Professionals facilitated a nature activity for a family under their care. Immediately after professionals facilitated a nature activity for a family under their care, professionals made a case narrative with the date and time, the name of the shelter, a written observation of the parent's parental needs based on the question "What needs did the parent have at this moment (based on your professional judgement)?", a written description of the nature activity based on the question: "You facilitated a nature activity. What exactly happened? Describe the activity", and a written observation based on the questions: "What did you notice in the parent? And what else? And what else?". Parents filled out an online questionnaire about their parental need satisfaction and need frustration and their connectedness to nature, of which the results have been published (E. Peters, J. Maas, D. Hovinga, et al., 2020).

Analyses

Data consisted of 160 case narratives. Cases with missing data and cases that did not fit the criteria of being a nature activity with a family were removed, resulting in a total of 149 cases for analysis. The data was thematically analysed using Atlas.ti 9.0.5 for Mac, using a Grounded Theory approach (Glaser & Strauss, 2017). The analysis was aimed to identify professional decisions in choosing nature activities for families in shelters One researcher conducted the analyses, supported by two researchers who parallel coded parts of the data. Researchers discussed the codes and importance of the codes until consensus was obtained. Memoing was used throughout the process of analysis. The analysis followed six steps:

1 Open coding. We used in vivo coding to explore and code the content, aiming for a set of codes that represented each case.

2 Axial coding. We analysed an initial set of 50 cases by comparing data within codes to explore patterns and exceptions in the data regarding that particular code. We asked ourselves what central themes could be used to describe these cases, resulting in concepts. All cases were subsequently analyzed by asking if each case could be properly represented using the initial concepts, to identify if other concepts were needed, or if existing codes should be made better applicable. During coding, constant comparison was used to repeatedly check ideas against data in order to avoid confirmation bias (Boeije, 2002). This cycle of coding and comparing continued in an iterative, non-linear fashion until saturation was reached.

3 Selective coding By exploring connections and through further combining and summarizing, core components were extracted.

4 Negative cases analysis Elements of the data that were in contrast with the apparent patterns in the data were analysed as negative cases. Analyses were refined or broadened until the codes covered almost all cases, which required the researchers to expand and revise their interpretation until all 'outliers' were explained. Any cases that did not fit the final model were documented in the final report to allow readers to evaluate them (Anney, 2014; Onwuegbuzie & Leech, 2007).

5 Network We identified structures in the data set by linking codes, creating hierarchy, and visualizing the codes in a network. This process formed a model that describes the choices that professionals made in facilitating nature activities for the support of parents in shelters.

6 Validation of the results To control the interpretations and consistency in meaning making the results were presented to a focus group of six participating professionals. We used peer debriefing by discussing the results of the study to a group of four researchers in the field of environmental psychology. One of the researchers who conducted the analyses took an academic course on grounded theory to improve reflexivity. In this article we illustrated the findings with raw data to present findings within their context.

RESULTS

Descriptives

Case narratives described nature activities with parents (age $M = 31.95$, $SD = 6.79$) and their children (age M = 5.2, $SD = 3.69$). Nature activities were conducted with one child ($n = 97$), two children ($n = 34$), three children ($n = 10$), four children ($n = 3$), or five children ($n = 3$) and one parent ($n = 143$) or two parents ($n = 4$) (missing data $n = 2$).

Professional decisions in choosing nature activities

Core component of the activity

The case narratives showed that professionals facilitated interactions between parent and child that followed a specific pattern. In this pattern, children switched between exploring away from the parent (Quote respondent 0191: "The children immediately ran around in the outdoor playground. The oldest (boy) jumped on the swing in the shape of a nest, the 3 middle ones (girls) climbed on the playset and the youngest immediately spotted the chalk") and seeking proximity to the parent (Quote respondent 0771: "They love feeding the animals. Always asking for confirmation whether mother sees them when they give bread to one of the animals. Mother reacts positively"). While children explored, parents functioned as a secure base by being available, responsive to the child's needs, and providing effective comfort (Quote respondent 1441: "When daughter comes over with a sad face (fallen) this changes by a single question from mother. Mother listens to what happened, and daughter soon says it's better already"). This pattern was present in almost all cases, but not always in a positive way. In some cases, parents were not available (Quote respondent 0671: "Now and again the child sought out his mother to show what he had discovered or get her attention. Mother didn't always know how to react, looked unsure of herself"), or restricted the child's exploration (Quote respondent 1571: "Daughter often indicated she wanted to walk on her own, while mother was trying to hold her by the hand. (…) Mother felt the need to keep her daughter close to her. She seemed eager to control this. When I asked about it, she said this was correct, that she finds it difficult to let her daughter explore out there"). Interactions according to this pattern were a core component of the nature activities that professionals facilitated.

Utilization of opportunities of nature

When promoting interaction according to the pattern of children's exploration away and return to the parent as a safe base, professionals chose nature activities that provided opportunities for exploration for the child and opportunities for recovery and building for parents.

Exploration opportunities were related to free play, as is illustrated in this example (Quote respondent 0741: "I see a child who wants to explore and the imagination that she shows; for example, putting the leaves she collected in her coat pocket, trading leaves with others, putting the leaves inside the toys she brought to see if they came out"). Professionals mentioned nature as an interesting play environment (Quote respondent 1551: "Both the playground and simply a frozen puddle of water provide a challenge to do something for and with the children"), they mentioned children's freedom in play behavior (Quote respondent 1151: "The children were excited, entered the bushes and shrubs without hesitation, searched under and on top, got dirty and laughed about it"), and they mentioned children's involvement in play (Quote respondent 1561: "Both the children play, have attention, have fun. Mother enjoys it. Children have their focus, playing is their activity in that moment").

Recovering opportunities for a parent were related to recovering from stressors, often indicated by feelings of relaxation and stress reduction, as is illustrated in this example: (Quote respondent 1641: "Mother looks relaxed and lets the children do their own thing in the woods. They are free to run and walk and play with the dog. Mother says she finds it calming to be outside in nature. I get the impression she feels at ease there").

Building opportunities for a parent were related to building or rebuilding positive experiences, social bonds, and family routines, as is illustrated in this example: (Quote respondent 1511: "Because they both love animals and the petting zoo was just around the corner of their home, they used to go there often. While here, they have not been there ever, not for the past seven months. I went to the petting zoo together with mother and daughter (…). Because they liked it so much and they enjoyed the animals and the fresh air so much, mother wants to do this more often. It is their moment together; in this way they share their love for animals").

This illustrative quote shows the links between exploration opportunities for the child (in this case: involvement in and excitement for feeding the ducks) and recovering opportunities for the parent (in this case: getting happy, coming into contact), and the parent's ability for being available: (Quote respondent 0341: Mother set the time frame at the beginning: three quarters of an hour at most. She was visibly tense. She did answer that it was okay to go to the park, because this moment was necessary for the contact between her and her son. (…) Mother and child walked to the park to feed the ducks. Son was visibly excited: jumped and laughed and hopped in front of mother. Walked back and grabbed mother's hand. In his other hand he had a bag with four sandwiches. Mother was not very talkative and gave short answers to son's questions. (…) She was not talkative at first. Answered only with yes and no, while the child was happy and cheerful. Child put his hand in hers. (…) When feeding, they got more and more in contact. Mother became happy with feeding

the ducks and became happy about the fact that her son was having fun. It was very clear that they were both enjoying at the same time.").

Practical dimensions when facilitating nature activities

In facilitating opportunities for exploration for the child and opportunities for recovery and building for parents, professionals made practical choices on eight dimensions. Each dimension describes two extremes between which professionals chose a position when facilitating a nature activity for a specific family (see Appendix 1 for the dimensions and illustrative quote). The following dimensions were identified:

1. Physical Activity: professionals chose between a more sedentary and more physically active activity;
2. Familiarity: professionals chose between a more well-known and a newer experience;
3. Nature Interaction: professional chose between looking at nature and interacting with nature;
4. Proximity: professionals chose between staying close to and going further away from the shelter;
5. Location: professionals chose between a nature activity in an indoor space and a nature activity in an outdoor space;
6. Predictability: professionals chose between working with more predictable elements of nature and more unpredictable elements of nature;
7. Autonomy: professionals chose between an activity that was largely supported by the professional and more autonomous family time;
8. Openness of the Assignment: professionals chose between an activity with a more directive assignment and with a more open (or no) assignment.

Professionals made personalized choices for each family. As an example, when professionals aimed the nature activity to help a mother in making contact with her child, professionals chose for a directive assignment for one parent (Quote respondent 1131: "The mother is holding back and insecure in making contact with daughter. The frame of the assignment helps her to show engagement"), and for an open assignment for another parent (Quote respondent 1471: "The mother gets enthusiastic from everything she sees. Some things trigger memories, like blowing on a whistle from an acorn hat that we found on the ground. But she also talks about everything you can find in the wood to use. Her son seems focused on mom: he listens and is interested in everything. In mother I see serenity, relaxation, diversion. Other emotions. Focus on her child").

Negative cases

Two negative cases were identified that were in contrast with the rest of the data. In these cases, professionals aimed for a different pattern for interaction between parent and child. Both cases described an activity in which professionals gave strict behavioral instructions to both parents and children with the intention to practice a new skill (psycho-physical resilience in one case, collaborative skills in the other case). In these cases, professionals left limited degrees of freedom to the child's exploration. In the rest of the data professionals may also have described

assignments and directions for behavior in parents in children, but still left room for initiatives from parent or child which allowed them to balance between proximity seeking and exploration.

Theories-in-use for choosing nature activities

We made a network of codes to identify structures in the data set, with the aim to understand professionals' theories-in-use. The model presented in Figure 1 describes professionals' theories-in-use.

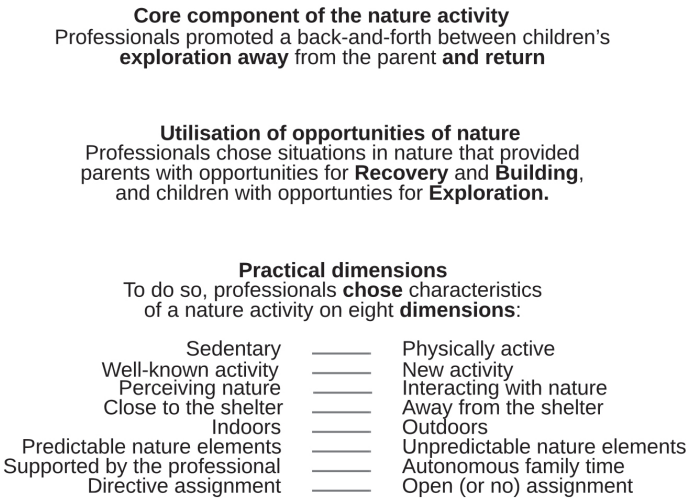


Figure 1. *Professional decisions in facilitating nature activities for the support of parents in shelters*

Reflection on focus group and peer debriefing

For validation, results were discussed in a focus group with six professionals who had participated in the study, and with four researchers in the field of environmental psychology. The professionals recognized that they used nature as a setting with recovering and building capacities for parents and exploration opportunities for children, and that they made choices on the eight dimensions to make the nature activity fitting for a specific family (Quote respondent 103: "I do indeed recognize that our social workers consciously think about relaxation moments for parents and play opportunities for children. As a team, we certainly think that nature is helpful in this"). All professionals in the focus group recognized that they chose activities that promoted a back-and-forth between children's exploration away from the parent and return. Some professionals recognized their own role in this (Quote respondent 101: "I do try to sometimes involve a parent in the child's activities: proximity; and sometimes stimulate a parent to let a child do something independently: distance. Sometimes you give some guidance, sometimes you just let things happen between parent and child"). Other professionals saw it as a side effect (Quote respondent 103: "I think that our family social workers are to a lesser extent consciously engaged in creating a balance in distance and proximity, but rather experience that this is a favorable side effect of working with nature", Quote respondent 104: "At present the issue of distance/proximity and

mutual contact between parent and child remains consciously observed by our colleagues but is not yet really pursued on purpose. It just happens, outside"). The professionals and the psychological researchers stressed that the choices for practical dimensions of the nature activities were partly influenced by practical considerations (Quote respondent 101: "But practical considerations, for example close to the shelter, free of charge, etcetera, are also decisive for the choice of activity") and that decisions were not always planned prior to the activity but partially made in response to what happened during the activity.

DISCUSSION

With this study we aim to uncover shelter professionals' theories-in-use for choosing nature activities for the support of parents. In the current discussion we connect the results of the analysis to literature to demonstrate how the study results relate to extant knowledge within the field, using the jargon from the field (Stern, 2007).

Linking findings to extant literature

When facilitating nature activities for the support of parents in shelters, professionals chose to facilitate nature activities that promoted a back-and-forth between children's exploration away from the parent, and return. These interactions followed the pattern of Secure Base Phenomenon (Ainsworth, 1967; Posada et al., 2013). Professionals facilitated such interactions, and only by exception opted for a different pattern for interaction (the 'negative cases' in the Results). Other patterns may have occurred if professionals made different choices in the design of nature activities, for example by choosing activities that left little room for exploration, or by choosing activities in which parents could not be available for the child such as activities that caused high levels of arousal, or activities that required directed attention on something else than the child. A core theme was identified in which nature actively served the secure base phenomenon. Social workers' primary focus on creating interactions according to secure base phenomenon is in line with a recent finding that child care professionals rely on Attachment Theory most often for their child supportive work (Department of Education, 2018).

In facilitating secure base interactions, professionals used nature's capacities for supporting children's exploration, and nature's capacities for recovery and building.

Regarding children's exploration, professionals chose activities in which nature functioned as an interesting play environment that allowed children's freedom in play behavior and stimulated their involvement in play activities. Theories on play suggest that natural environments can function as a setting for rich explorations (Heft, 1988; Nicholson, 1972). Natural environments are described as a setting that fits with children's needs and desires for exploration and play (Spencer et al., 2019), where children play long, involved and diverse (Luchs & Fikus, 2013; Zamani & Moore, 2013). Professionals' theories-in-use revealed that professionals set the scene for secure base behavior by choosing the environment so that it offered exploration opportunities for the child.

Regarding parents' recovery and building, professionals choose activities in which nature offered opportunities for restoring energy, reducing feelings of anxiety, and experiencing positive interactions. Experts in the field of environmental studies have also described these capabilities of nature with the terms restoration and building (Markevych et al., 2017), with restoration referring to the ability of nature to restore resources that have been depleted in efforts to cope with stressors, and building referring to the deepening or strengthening of capabilities for meeting everyday demands (Marselle et al., 2021). Several theories were aimed to explain why natural environments can be experienced as non-threatening and stress reducing (Kaplan & Kaplan, 1989; Stephen Kaplan, 1995; Kuo, 2015; Ulrich et al., 1991; Ulset et al., 2017; Wilson, 1984). Interestingly, recovery from stressors can been linked to higher psychological availability of parents, and more autonomy supportive and less controlling parenting behavior (Robichaud et al., 2020; Van Der Kaap-Deeder et al., 2019). Professionals' theories-in-use revealed that professionals set the scene for secure base behavior by choosing the environment so that it facilitates parents to be available to their child and supportive of the child's autonomy.

To facilitate exploration in children and recovery and building in parents, professionals made practical choices on eight dimensions. Professionals made unique choices on these dimensions for each family. According to Theory of Affordances (Gibson, 2014) every physical setting has unique properties for every individual. This means that, when aiming to facilitate certain behavior through engagement with an environment, one must consider the physical aspects of the environment as well as the characteristics of the family. Professionals' theories-in-use show that they chose unique characteristics of a place to make its affordances fitting for a family.

Notes for interpretation

Professionals chose to facilitate interactions according to secure base phenomenon in their nature activities. This does not mean that we expect nature activities to be uniquely suitable for secure base interactions, nor that we expect professionals to use their knowledge on secure base phenomenon only during activities in nature. It may equally well be expected that professionals facilitate possibilities for secure base interactions on other moments in their professional practice, such as during indoor play moments or dinner time. This research shows that professionals also included secure base interactions in their theories-in-use for facilitating nature activities.

The current study uncovers professionals integrated knowledge that is compatible with attachment theory in their theories-in-use for choosing nature activities. Professionals might have well used other knowledge aspects in their theories-in-use, such as knowledge on physical fitness (which could have shown if professionals chose activities focused on building physical strength or getting vitamin D), or knowledge on social connectedness (which could have shown if professionals chose activities focused on connecting to the neighborhood or building friendships), or knowledge on self-connectedness (which could have shown if professional chose activities such as forest bathing, mindfulness, or yoga). It is of interest that professionals chose a social interaction perspective because it adds a new perspective to existing literature that has mainly focused on nature activities

for physical health and mental wellbeing (Bratman et al., 2019; Lackey et al., 2020; Twohig-Bennett & Jones, 2018; Van den Bosch & Sang, 2017).

As professionals in the focus group highlighted, some aspects of the activity 'occurred' without professionals' intentional guidance. Each activity had influences and guidance from the professional, the parent, the child, and the natural environment, that all interacted with each other, which makes the activity not only a result of the choices of professionals. Although we recognize that these influences cannot be untangled, we described this as professional theories-in-use, because professionals did leave room for what occurred without their intention, evaluated it as valuable, and allowed it to continue.

Strengths and limitations

The study was conducted in the setting of a shelter, during regular working practice, with regular clients. This contributed to the ecological validity of the study findings. The study was conducted among a selected group of professionals. All professionals were educated in child and family social work, were selected by their team manager, worked in a shelter that had implemented nature to enhance the wellbeing of families, and were trained in the implementation of nature for parents. This allowed us to analyze data from professionals who we expected to be skilled and knowledgeable on the subject. Their theories-in-use were the basis on which a practice-based model was made.

The data in this study consisted of case descriptions in which professionals described moments in their own practice. As Ryle (2009) argued, the mind of professionals is revealed in their doings, and explainable by the doers' aims. This makes case descriptions suitable material for analyzing theories-in-use. We recognize three limitations in the way we collected case descriptions. Firstly, the case descriptions were limited in richness. Case descriptions were based on a predefined set of questions, which limited the options for rich elaborations by professionals, and limited opportunities for researchers to ask further questions. The written accounts by professionals were a representation of their actions in practice, but a first-hand involvement from the researchers, using their reflective and interpretive stance in interaction with the professionals, could have deepened our understanding. Secondly, espoused theories could have interfered with theories-in-use (Argyris & Schon, 1974). Professionals wrote about their own practice, which is already a reflection on their behavior (even though it was written immediately after the nature activity) and not necessarily an actual representation of the behavior itself. Espoused theories that reflected professionals' desired behavior, professional intentions, and world views could have interfered with their descriptions of their actual behavior. Professionals may have filtered their actual actions through the lens of their espoused theories, to make it sensible, logical, and concurrent with their values. A relational approach in data collection with researchers closer to the professionals, e.g. by actively observing professionals in action, could have strengthened the study. Thirdly, data collection and analysis were performed separately, which prevented theoretical sampling (Glaser & Strauss, 2017). Theoretical sampling could have made further examination of the categories

and their relationships possible, such as an examination of the conditions under which certain characteristics of nature activities were chosen.

Implications for practice

This study described professionals' theories-in-use for choosing nature activities for the support of parents. The results of the study can make professionals aware of the choices they and their colleagues made and the values and norms to which they gave priority, which gives room for reflection on these choices. Professionals can use the results as a 'cheat sheet' when making choices for facilitating nature engagement for their own clients. Professionals can also use the results as a 'mirror' to reflect on their own practice, for example by discussing if the theories-in-use reflect what they consider good practice. To aid this practical use of the study results, we made a printable poster that can function as a reflective tool for practice (Appendix 2).

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data Availability Statement

The raw data of this study are not publicly accessible due to privacy and safety concerns for the participants. For access to the dataset for verification, please contact the corresponding author.

Acknowledgements

With acknowledgement to Loes van 't Hoff for her work in collecting the data.

APPENDIX 1

Eight practical dimensions between which professionals chose a position when facilitating a nature activity for a family: illustrative quotes

Dimension 1: Physical activity	Professional's choice: Sedentary	Physically active
	Example from data, respondent 0091: "Mother was mainly involved in observing, the children amused themselves especially with the leaves." **(**Sedentary)	Example from data, respondent 0351: "End of the afternoon ran outside together. The whole world was white! We started to throw snowballs to one another. Laughing and running! (…) A little later he also began to throw (snowballs) and to hide himself! (…) Afterwards worked together at making a large snowman." (Physically active)
Dimension 2: Familiarity of experience	Professional's choice: New activity	Well-known activity
	Example from data, respondent 0001: "Mother is clearly not used to undertake activities outdoors with the children. She said she would sit herself down on the bench while the children play together. When I suggested it might be fun to play together, she was surprised. She first could not believe that she was to hide herself as well. Once she understood the game, she was clearly enjoying it." (New activity)	Example from data, respondent 0051: "Mother and daughter went out to play football. They regularly do this. You could tell they are well attuned to each other." (Well-known activity)
Dimension 3: Nature interaction	Professional's choice: Perceiving nature	Interacting with nature
	Example from data, respondent 0561 "I am going outside with mother and son to do some painting in nature. They are going to paint the surroundings and can choose the spot they want to paint themselves." (Perceiving nature)	Example from data, respondent 0641 "Went out with mother and daughter to visit the mother of her friend. There we stroked a rabbit, we offered it food and drink, and cleaned the cage together with mum." (Interacting with nature)

Continued

Dimension 4: Proximity	Professional's choice: Close to the shelter	Away from the shelter
	Example from data, respondent 1171 "Mother and children were not able to participate in the winter walk because of security issues. They cannot yet leave the premises. We organised a treasure hunt in the garden for them, with the kids searching for the hidden treasures." (Close to the shelter)	Example from data , respondent 0501 "We cycled to the woods with a number of mothers and children. There we went for a walk." (Away from the shelter)
Dimension 5: Location	Professional's choice: Indoors	Outdoors
	Example from data, respondent 0621 "When we came in and saw the puppy dog a huge smile came to his face. We all sat down on the floor and first discussed what (not) to do with and near the doggy." (Indoors)	Example from data, respondent 0111 "Madame went outside with her children (+personal counsellor). In the playground the children went out to play." (Outdoors)
Dimension 6: Predictability	Professional's choice: Focus on Unpredictable elements	Focus on Predictable elements of nature
	Example from data, respondent 0381 "Then we passed a park with animals, children both love and somewhat fear animals. A nice combination for both children. The eldest, age 5, is very afraid of dogs and the youngest, age 2, not at all. Mother stimulated the kids to stroke and feed the animals. This went well and gave lots of fun." **(**Focusing on unpredictable elements of nature)	Example from data, respondent 0611 "Once in the park we sat on a bench for a while and enjoyed the surroundings and played 'I spy with my little eye'." (Focusing on predictable elements of nature)
Dimension 7: Autonomy	Professional's choice: Supported by professional	Autonomous family time
	Example from data, respondent 0991 "I demonstrated how to do the assignment. After doing it myself a few times I let mother take the initiative to do the activity with her child and I observed what happened." (Supported by professional)	Example from data, respondent 0701 "The parents went to play in the snow with the children. The parents and the children attacked each other with snowballs. The children were chased and chased the parents." (Autonomous family time)

Continued

Dimension 8: Openness of the assignment	Professional's choice: Directive assignment	Open (or no) assignment
	Example from data, respondent 0611 "Then I explained the next assignment. Together all sorts of autumn leaves, twigs, feathers, and seeds/fruits were collected. These were collectively stored in one bag. On a clearing in the park, we played some ball games (throw a ball in the bucket, throwing and catching while counting)." (Directive assignment)	Example from data, respondent 0331 "They played outside together, the eldest son did not fancy it very much but loosened up more and more while playing. They went on the seesaw, went off the high slide together, chased each other, the atmosphere was relaxed." (Open (or no) assignment)

Appendix 2

A reflective tool for professionals

General discussion

GENERAL DISCUSSION

In this general discussion I reflect on how the dissertation contributed to its aims, which was to explore the potential benefits of nature for families in shelters, to test the impact of nature interventions on parental wellbeing, and to describe professional decisions in choosing a nature intervention for the support of parents. To do so, I provide an overview of the empirical findings and a critical reflection on the study's strengths and limitations. I give recommendations for practice, explore the theoretical implications of the findings, and provide directions for future research. The dissertation ends with an overview of products developed for knowledge dissemination.

How did this dissertation meet its aims? An overview of empirical findings

Exploring the potential benefits of nature for families in shelters

Chapter 1 described what professionals found when exploring the benefits of nature for family life in shelters. Professionals described that the use of nature in women's shelters afforded families with leisure time, social connectedness, wellbeing, metaphoric experiences, and that it supports parenting practices. The affordances that professionals identified for leisure time, social connectedness, wellbeing, and metaphoric experiences concur with evidence for effects of nature in other domains of life, such as schools and living environments (for reviews, see Gill (2014); Russell et al. (2013). A novel finding was that professionals expected that nature supported parenting. The comments made by professionals provided the basis for hypothesizing that nature supported parenting by providing opportunities for experiencing relatedness between parent and child, parental feelings of competence, and autonomy in parenting. Professionals' explanations could be summarized according to the Basic Psychological Needs (Ryan & Deci 2017) that are theorized to drive motivation and engagement. Arguing from this theoretical perspective, opportunities for fulfilling parental basic psychological needs lead to more motivated and engaged parenting. This insight is of particular importance because parents who raise their children in women's shelters often encounter specific and unique risk factors that make parenting difficult, particularly linked to parents' autonomy and experienced competence in parenting (Anthony et al., 2018; Bradley et al., 2018; Glenn & Goodman, 2015; Peled & Dekel, 2010). For parents who live in women's shelters, restoration of parental basic psychological needs might be needed even more than for any other parent. Hypothesis testing research is needed to bolster the claim that contact with nature provides levers for intervening in basic psychological needs for parents in shelters. The following two studies were aimed to test the hypothesis that experiencing nature supports basic psychological needs for parents living in shelters.

Testing the impact of nature interventions on parental wellbeing

Chapter 2 reported results from a quasi-experimental study that tested if experiencing nature was associated with the basic psychological needs of parents in shelters. Basic psychological need satisfaction and basic psychological need frustration were measured among parents in shelters ($N = 160$), with one measurement during parent-child interaction in the standard indoor context of the shelter and one measurement during parent-child interaction while experiencing nature, counterbalanced. Experiencing nature as opposed to being in the indoor environment was

associated with enhanced need satisfaction ($d = 0.28$) and reduced need frustration ($d = -0.24$). The effect was especially pronounced for parents with young children. Our findings suggest that experiencing a natural environment was associated with parents' psychological need fulfillment as they interact with their children in the context of sheltering. This finding provided further promising evidence for nature as a potential avenue for supporting parental functioning and resilience in the face of risk. These findings do, however, still require further studies to test if these effects replicate across settings and withstand controlled experimental designs.

Chapter 3 reported results from a single case experiment among three families in a homeless shelter. The study tested the impact of personalized exposure to a natural environment on basic psychological need fulfilment in parenting, overall affective state, and satisfaction with life. Contrary to what we expected, we found no effects of nature exposure on the outcome measures for overall wellbeing, even though previous studies have shown associations between nature exposure and improved wellbeing (Biedenweg et al., 2017; McMahan & Estes, 2015) and associations between fulfilment of the basic psychological needs and overall wellbeing (Brenning et al., 2017; Ryan & Deci, 2017). Signs that the occurrence of major life events during data collection showed no visible ups or downs on our measures of overall wellbeing of the shelter clients tempered our expectations on the sensitivity of the measures and complicates the interpretation of the findings. Exposure to nature did increase basic psychological need fulfilment of parents. To support parental basic psychological need fulfilment shelter professionals may encourage families to experience nature during their time in shelter.

Describing professional decisions in choosing a nature intervention for the support of parents

Chapter 4 reported on professional theories-in-use, synthesized into a model that can be used as a reflective tool among shelter professionals. The model includes the use of nature to promote a back-and-forth between children's exploration away from the parent and being with the parent. In facilitating these interactions, professionals reported that they used nature as an environment with restorative and building capacities for parents and as an environment with supportive qualities for children's play. A dimensional framework was extracted based on professional's theories-in-use, that can be used by other professionals to orient themselves when choosing options for activities.

General conclusion

In the introduction of this dissertation, I reflected on the potential negative impact that living circumstances in shelters may have on family life and functioning. I described that several shelters introduced nature interventions with the intention to help families find ways to live well despite the stressors of sheltered living. The studies in this dissertation explored and tested the potential benefits of nature interventions for families in shelters. Nature interventions were associated with improvements in the basic psychological need fulfilment of parents, which is reported by shelter professionals based on their observations of families, and by a quasi-experimental and experimental study among parents in shelters. The studies may together provide good evidence for effectiveness (Nederland Jeugdinstituut, 2022) of nature as an intervention for the support of basic psychological need fulfilment of parents in Dutch shelters.

Strengths and limitations

Practice based

This dissertation contains four studies, all informed by practice and conducted in practice. Embedding research in practice generally tends to increase the ecological validity of the study, its relevance, and its meaningfulness to practice. The choice to work with professionals from practice brings as limitation that the quality of the interventions was determined by the quality of the professional. Although we did not systematically collect information on the professionals' competence of working with nature interventions, we know that some professionals had an expert level from being professionally educated in the use of nature interventions followed by years of professional experience, while others were beginners. With the intention to enhance the professionals' competence in using nature interventions, we organized training sessions in which professionals used each other as a learning resource by sharing ideas and experiences with nature activities and reflecting on their practice in conversations with a diverse group of colleagues. Without shortchanging the training, it is likely that this brief training intervention did not put all professionals on an expert level, which may have limited the quality of the intervention's delivery. Future research can select professionals with specialized knowledge and skills about nature interventions to study the full potential size of the effect of nature interventions.

Furthermore, the embeddedness of the studies in the specific practices limits insight in the extent to which the nature interventions generalize to other contexts. Research in other contexts is needed to determine the extent to which the effects of nature interventions generalize to shelters in other countries as well as in other forms of social care.

Sampling

In both the inductive exploration, the quasi-experiment, and the case narrative study we invited all shelters that participated in a nature project to participate in the study. In the inductive exploration four out of the four shelters chose to participate, and one shelter location was excluded from participation because professionals scarcely used nature, resulting in three participating shelters. In the quasi-experiment and the case narrative study 21 out of 21 shelters chose to participate, and one shelter was excluded from participation because they were too short on staff to allocate professionals to participate in the research, resulting in 20 participating shelters. The large number of participating shelters increased the representativeness of the results, and the small and controlled dropout can give researchers and readers a sense of the process of sampling.

The inductive exploration and the case narrative study worked with professionals as participants, selected by shelter managers. In the inductive exploration, no professionals dropped out during the informed consent procedure, nor during data collection. In the case narrative study, no professionals dropped out during the informed consent procedure, but 23% of professional participants dropped out during data collection. Natural turnover of staff and clients, which is to be expected with a study period of 12 months, explained almost half of the dropout. The remaining dropout was 12%, which is acceptable (Furlan et al., 2009).

In the quasi-experiment the rigor in the sampling procedure was not optimal. We collected insufficient information on the selection process of participants. We did not have information regarding the number and characteristics of parents who were eligible for participation but not approached, nor the number and characteristics of parents that dropped out in the informed consent procedure, which makes it impossible to assess if parents who participated differed from eligible participants. This forms an important threat to the generalizability of the results of this study.

Multiple methods

This dissertation contains of inductive and deductive studies, using qualitative and quantitative methods. The use of multiple methods can allow a detailed exploration of a complex phenomenon (Creswell & Clark, 2017; Halcomb & Hickman, 2015; Wisdom et al., 2012), because it provides a more balanced perspective and more depth, breadth and richness than could be gleaned from a single perspective (Borbasi & Jackson, 2015; Morse & Chung, 2003; Schulze, 2003). In our studies, narratives and case descriptions from the inductive exploration and the care narrative study add connotation to the findings of the quasi experiment and single case experiment. The results of the quasi experiment and single case experiment in turn adds precision to the findings from the inductive exploration. As such, the multiple methods create a more complete picture (McKim, 2017) and helps readers to understand the matter because one study can be used to illustrate or clarify the results from another (Creswell & Clark, 2017; Halcomb & Hickman, 2015).

Sequential design

The project took a flexible approach, with studies building upon each other. The exploratory findings of the inductive exploration were subject to hypothesis testing research in the quasi-experiment and the single case experiment, and the outcomes of the quasi-experiment and the single case experiment were an impetus for exploring theories-in-use in the case narrative study. This sequential design allowed us to take an ongoing inquiry stance, with the findings from one type of data collection providing a basis for the collection of a second set of data (Halcomb & Hickman, 2015).

Impact on practice

The insights gained from this dissertation gained the interest of professionals and field organizations. Four years after implementation, the nature interventions were integrated in standard care practice on several locations (Van den Bogerd & Peters, 2021). We have been asked to develop courses on the use of nature interventions for the initial Bachelor Education in Social Work, to develop professional training courses for professionals in practice (Lectoraat Natuur en Ontwikkeling Kind, 2022), and to develop products that can be used in practice (Bogerd et al., 2021; Peters, 2022; Peters, Maas, et al., 2021), to further help integrate research findings into practice. The fact that practice professionals were active partners in the studies who shared and co-created knowledge together with researchers may have accelerated the mobilization of research outcomes into practice (Racine et al., 2022).

Ethics

The studies in this dissertation had several ethical dilemmas.

Participant safety. Participants who were in shelters due to safety issues required extra precautions to protect their safety and anonymity. We did not collect names or addresses of shelter participants. This was deemed necessary for clients' safety, even though it provided limitations to transparency and obstructed us in informing the participants about the research outcomes. We stored the signed informed consent forms separated from the data to avoid a connection between the data and the identifiable information. We did collect information on participants' gender and age and the gender and age of their children, which could potentially lead to identification. For the safety of participants, we chose to not publish the data. Study 3 needed extra attention because the design required that the raw data was published in the results section of the article. We chose to not mention the location of the shelter where this study was conducted, and we published the potentially identifiable personal information separate from the data on the outcome measures.

Several precautions have been taken to secure the safety of participants and researchers during data collection. Shelters that worked with clients whose safety was at stake collaborated with local police and shelter security to design natural environments that met the safety standards for clients with the highest safety classification. Measures we taken, such as high fences to prevent people from looking into the gardens, fixed times during the day when only shelter families were allowed in the outdoor areas, wearable alarms for participants, and extra police presence in the public outdoor areas. To protect the safety of the researcher in the single case experiment, clients were excluded from participation when they were assessed as a risk to the researcher's safety, for example due to problems in anger management. Data collection on one location of the quasi-experiment stopped when the safety of a professional and her clients could not be guaranteed during moments in nature, due to high levels of aggression among her clients.

Informed consent. We worked with participants with mild intellectual disabilities, participants who did not understand Dutch, and illiterate participants, which required adaptations to the informed consent procedure. We developed a shortened informed consent form that explained the basic rights of participants in short sentences supported by pictograms. We chose to let the client's care professional read out the research information and the complete informed consent form, before summarizing it with the shortened informed consent form and pictograms. For clients who did not understand Dutch, an interpreter in the families' native language was available over the phone. A strength of this procedure is that we had several sources from which participants could get their information: in writing: long version, in writing: short version, in pictograms, read aloud, and translated in their native language. Another strength is that participants had a familiar care professional to discuss their questions and considerations with. A potential threat is that clients felt an obligation to participate towards their care professional. To reduce this threat, it was emphasized that their participation was voluntary, that their participation would have no consequences for their care in the shelter, and that they could always stop their participation. Care professionals were instructed to pay extra attention to these aspects of the consent form.

Living aspects of the natural environment. According to the research design adults were always present when children interacted with the living aspects of the natural environment. Anecdotal experience showed that this was necessary to protect children, flora, and fauna from violent experiences. We heard of four cases in which animals that lived either on the shelter property or in the shelter surroundings were violently treated, in three cases followed by death, by children on moments when adults were not present. Although these cases did not occur during data collection nor during the research period, it is important to reflect on this. Violence towards an animals or other living organisms should be avoided for the sake of the animal, as well as for the sake of the child for whom the assault is yet another experience of violence. This calls for caution on all interactions between a child and other living organisms. Guidelines on taking care for living aspects of nature during care interventions mainly focus on animal assisted interventions with chosen animals (International Association of Human-Animal Interaction Organisations, 2014; Jegatheesan et al., 2015; McCausland, 2014; Ng, 2019; Wenocur et al., 2018). The guidelines presume that professionals can select an animal on qualities such as being controllable, predictable, and reliable, and that professionals can choose for the presence or absence of an animal, respecting the choice of the child and considering the state of the child. The guidelines also presume that encounters with non-controllable wildlife can be limited to 'observation and contemplation'. These assumptions are not always valid in the standard practice of shelter care where social work is delivered in the natural habitat that flora, humans, and other fauna share. In places like gardens, parks, beaches, and forests, children will have chance encounters with all sorts of wild flora and fauna. These encounters include animals that show unpredictable, uncontrollable, and unreliable behavior such as seagulls, butterflies, and spiders. The encounters also include children who may not be in a state or on a developmental level where they can be assumed to be responsible, respectful, and knowledgeable in interaction with other living organisms, and children who can be expected to show other types of conduct than 'observation and contemplation' when in interaction with other living organisms. To support practitioners in ethical conduct in such situations, guidelines are needed that focus on the role of shelter professionals during children's encounters with the living aspects of nature in their living context.

Recommendations for practice

Weighing the strength of evidence, consequences, and costs

Several factors are important to weigh when recommending nature interventions for the support of parents in shelters (Alonso-Coello et al., 2017; Alonso-Coello et al., 2016; Guyatt et al., 2008). Firstly, it is important to evaluate the strength of the evidence. The association between nature interventions and parental basic psychological needs are indicated by multiple studies using multiple methods, including a quasi-experimental and an experimental study, which gives strength to the study results, but the sampling of the participants poses an important threat to the generalizability of the study findings. Also, the embeddedness of the studies in the specific contexts of these Dutch shelters limits insight in the extent to which the nature interventions generalize to other contexts. Overall, the studies may together provide good evidence for effectiveness (Nederland Jeugdinstituut, 2022) of nature as an intervention for the support of basic psychological need fulfilment of parents in shelters.

Secondly, it is important to weigh the desirable and undesirable consequences. As mentioned in the introduction of this dissertation, studies have linked nature interventions with several benefits for people's wellbeing. Enhanced parental need fulfilment is one of those benefits. Clients who do not experience enhanced parental need fulfilment might experience other potential benefits such as the opportunities for leisure time, social connectedness, wellbeing, and metaphoric experiences that shelter professionals described in the inductive exploration. At the least clients may be exposed to day light, fresh air, and vitamin D with their potential benefits. Undesirable consequences of nature interventions can be found in the harm that nature might cause to people, such as through exposure to airborne allergens or dangerous encounters with wildlife (Marselle et al., 2021). However, exposure to airborne allergens is also related to protection from allergic sensitization, and dangerous wildlife encounters are also related to strengthening experiences (Marselle et al., 2021). Studies are therefore inconclusive if more exposure to nature interventions is associated with more potential harm. The nature interventions we used were conducted in natural environments on the shelter property or in the vicinity of the shelters, such as gardens, parks, or playgrounds, and although no environment is free of potential harm, these environments are part of the everyday living context and the threats that they pose do not exceed the 'threats' of everyday life.

Thirdly, it is important to weight if allocation of professional time, place, and money on nature interventions is optimal allocation of these resources. Time spent on nature interventions does not necessarily require extra time from professionals. As professionals showed (Van den Bogerd & Peters, 2021) they can use nature interventions during their usual social work. Outdoor walk-and-talk-therapy is an example of the use of a nature intervention (walking in a natural environment) in combination with usual professional care (giving therapy). In this way nature interventions do not cost extra time but may result in extra benefits from activities that professionals are already doing. Regarding place and money, the opportunity costs of creating a natural environment are high in the setting of shelters. Although studies indicate the cost-efficiency of natural environments in living areas (McPherson et al., 2005; Wolf & Robbins, 2015), not only for their impact on human health and wellbeing but also for climate control, heat reduction and water management in cities (Kardan et al., 2015; Millennium ecosystem assessment, 2005; Roberts et al., 2020; Whitmee et al., 2015; WHO, 2016), the question remains if it is optimal allocation of place to use the scarce places that shelters have for natural places. Future research can weigh the benefits and costs of natural environments on the shelter property against the benefits and costs of the use of natural environments in the vicinity of the shelters, to help make that trade-off.

The practical relevance of the findings

Basic Psychological Needs Theory argues that psychological well-being and optimal functioning are based on feelings of autonomy, competence, and relatedness, and that contexts that support or thwart these needs will impact wellbeing and functioning (Deci & Ryan, 2000; Ryan & Deci, 2017). Studies have indicated the importance of need satisfaction for parents by showing that their need satisfaction is related to their wellbeing, to positive parenting practices, and to the wellbeing of their child (Allen et al., 2019; Costa et al., 2019; Dieleman et al., 2019; Grolnick et al., 2021; Lo

Cricchio et al., 2021; Mabbe et al., 2018; Nishimura et al., 2021; Van Der Kaap-Deeder et al., 2019; van der Kaap-Deeder et al., 2015). Parents are therefore advised to seek out daily need fulfilling experiences with their child (Brenning et al., 2017). For parents who live in shelters, restoration of parental basic psychological needs might be needed even more than for any other parent, but few studies have thus far given indications on what may function as need fulfilling experiences for parents. This dissertation showed that experiences in a natural environment can function as a need fulfilling experience for parents in shelters.

The studies in this dissertation that focused on the impact of nature activities showed improvements in parental need fulfilment, but the improvements were small, and we have no indications on the duration of the effects. This may raise the question of the practical relevance of the findings. But small effects can have important implications when they are repeated over time (Funder & Ozer, 2019). If parents can find ways to improve their parental need fulfilment on a daily basis, the small daily improvements may accumulate and have more important implications than the small effect size suggested.

Based on the studies in this dissertation, shelter professionals may feel strengthened to invite families for nature activities to contribute to family life, and to parents' basic psychological need fulfilment specifically. The practical examples of nature activities that the inductive exploration offers may give professionals concrete ideas for their own practice, and the tool for choosing nature activities that the case narrative study provides may be used for reflection on practice. I invite professionals to maximize the input of families for the choice for nature interventions as part of their care, because interventions are most effective when responsive to a family's specific problems, strengths, personality, sociocultural context, and preferences (American Psychological Association, 2022). This dissertation is an invitation to professionals to determine the applicability of the research conclusions to their practice, as an important next step towards evidence-based practice (American Psychological Association, 2022; APA Presidential Task Force on Evidence-Based Practice, 2006).

Theoretical implications of the research findings

Physical environments associated with parenting experiences

Several theories have described how physical environments are associated with people's feelings, thoughts, and behavior (Gibson, 2014; Heft, 1988; Kaplan & Kaplan, 1989; Nicholson, 1972; Ulrich et al., 1991; Wilson, 1984). This dissertation adds that, for parents in shelters, the physical environment is also associated with parenting experiences.

Nature interventions for Basic Psychological Need Fulfilment

Basic Psychological Needs Theory argues that psychological well-being and optimal functioning are based on feelings of autonomy, competence, and relatedness, and that contexts that support or thwart these needs will impact wellbeing and functioning (Deci & Ryan, 2000; Ryan & Deci, 2017). This dissertation showed that a change from indoors to a natural environment can have an impact on need fulfilment amongst parents, even though the impact on the short term still appears small.

The physical environment, and the natural environment specifically, can be added as a factor of interest for the study and support of parental basic psychological needs.

Relating our outcomes to existing explanatory models?

Several models aim to explain the link between contact with nature and psychological wellbeing (Kuo, 2015; Markevych et al., 2017; Marselle et al., 2021). A relevant question is how and if enhanced parental basic psychological needs fits into these models. To be able to relate our study results to existing models, we need to know more about how the characteristics of the nature interventions as described in the case narrative study effects the states and behaviors of both parents and children, and their relation to our outcome on parental basic psychological needs. This would help to place the outcome on parental basic psychological needs in a broader context.

Directions for future research

A need to better understand the impact of nature interventions for the support of parents in shelters

Empirical studies are needed to aid a fuller understanding of the potential impact of nature interventions for the support of parents in shelters. Future research may aim to deliver a high intervention quality by selecting professionals with specialized knowledge and skills about nature interventions for the support of parental basic psychological needs. To determine the extent to which the effects generalize to shelter services in other countries, studies outside of the Netherlands are needed. Also, to aid insight in generalization studies in other forms of social care are needed, such as studies that focus on nature interventions for the support of parental basic psychological needs in refugee centers, community work, or youth and family centers. Furthermore, the lack of effects from the nature interventions on overall wellbeing in the single case experiment calls for a replication study with a more sensitive instrument for measuring parents' wellbeing in the setting of shelters.

A need for a systematic review of extant literature on nature interventions for parenting

There are a growing number of studies about the benefits that interventions in nature can have for parenting. A systematic review is needed to identify, evaluate, and summarize the findings of these individual studies to uncover trends as well as inconstancies, and so aid the identification of possible directions for additional research. It would be helpful to understand how different outcomes on parenting relate, such as more responsive and connected communication between parent and child in nature compared to an indoor environment (Cameron-Faulkner et al., 2018), a different 'existing' as a family while hiking in nature (Baklien et al., 2016), families' experiences of increased family interactions while on the beach (Ashbullby et al., 2013), increased positive affect of daughters and decreased negative affect of mothers and daughters after outdoor walks (Izenstark et al., 2021), less negativity during a nature walk, and more neutral topics in conversations between mothers and daughters while walking outdoors, compared to indoors (Izenstark et al., 2021), a decrease in stress among parents after a trial with regular park visits (Razani et al., 2018), and parental basic psychological need fulfilment during nature activities (reported in the current dissertation). Because there is yet no consistency in terms used to describe

the nature interventions, a scoping review that maps the terms and key concepts in this area might be a helpful precursor to a systematic review.

A need to relate our study results to a broader network of findings

As mentioned in the paragraph on theoretical implications of the research findings, it would be helpful to connect the study results to an existing framework, such as Kuo (2015); Markevych et al. (2017); Marselle et al. (2021). This requires studies that focus on how the characteristics of the nature interventions as described in the case narrative study effect the states and behaviors of both parents and children, and their relation to our outcome on parental basic psychological needs. Potential associations can be studied between nature activities with secure base interactions as essential element on the one hand and states and behaviors such as psychological wellbeing, attention restoration, social connectedness, metaphoric experiences, involvement in play, and children's exploration on the other hand. The study of associations can be a precursor to exploring the potential role of these states and behaviors as mediators in the relationship between nature interventions and basic psychological needs.

Several studies have mentioned aspects of attention restoration as an explanation for the parenting supportive benefits of nature activities. Ashbullby et al. (2013); Baklien et al. (2016); Cameron-Faulkner et al. (2018); Izenstark et al. (2016); Izenstark et al. (2021) mentioned parents' experiences of being immersed in the environment and escaping daily stressors, while the environment allowed parents to achieve their parenting goals, such as unifying the family, spending time with the children in a fun way, passing down experiences, contributing to the children's health, and maintaining an affordable lifestyle. Attention Restoration Theory (Kaplan & Kaplan, 1989) argues that experiences of being immersed in the environment, escaping daily routines, thoughts and stressors, and experiencing compatibility between the environment and one's goals and preferences, can contribute to recovery from mental fatigue, clearer thoughts, and better concentration. When studying potential mediators in the relation between nature interventions and basic psychological needs fulfillment, exploring the role of attention restoration may be an interesting starting point.

A need to understand the implementation process of nature interventions

Practice may be aided by future research focused on the implementation process of nature interventions. In this dissertation I referred to 'nature interventions' to describe the action of intervening in the normal practice that thus far focused on human-human indoor social work. There may come a point when nature interventions lose their status of an 'intervention' and become normalized as part of regular social work in shelters. We know that several shelter locations have taken steps to make nature part of their daily practice, for example by integrating nature in their methods for child support (for examples, see Van den Bogerd and Peters (2021). It would aid the process of normalization if professionals could gain insight in the stages of normalization and the actions that each stage requires from them. This is especially needed because the implementation of nature in child and family social work can be expected to have some challenges. Firstly, implementing nature requires not 'just' the implementation of a new thing, device, or tool

within the existing work context, but the implementation changes professionals' daily actions as well as their interactions with the families they work with, and the context in which they work. This adds complexity because it requires from professionals that they relate to several 'objects' of change during the implementation process (May, 2013). Secondly, child and family social work is dynamic work in which standard practice is never standardized practice. In everyday working situations professionals act according to their judgment of 'the right thing to do for this family right now', in a great number of unpredictable situations. To be able to form a situated judgement, professionals draw from technics (ideas on what is good or effective practice), from ethics (ideas on what is right, valuable, just) pragmatism (ideas on what is feasible), and practical knowledge (Simons & Ruijters, 2014). To implement nature in the standard practice, nature should be incorporated into every professional's situated judgement, which gives additional complexity to the implementation process. Normalization Process Theory (May et al., 2011) provides a possible framework for studying the process of implementation by focusing on the work that professionals do in their changing practice while making nature interventions a normalized part of their work.

Pushing the research agenda: parental need fulfilment while place and space is under pressure

Future studies on parental basic psychological needs can add the physical environment as a factor of interest, for example by studying where parents find fulfillment of their basic psychological needs. Future research with a focus on physical environments for parents' basic psychological need fulfilment may have relevance both in and outside the context of shelters. It would be interesting to understand which physical environments parents consider supportive. Just as a couch with a television and a warm blanket may be supportive for relaxation, or as a long track with hurdles and a stopwatch may be supportive for physical training, there may be places parents find supportive to their basic psychological needs. In which places do parents experience competence and autonomy in their parenting, or relatedness to their child? The kitchen table? The big bed? The neighborhood playground? If we can recognize those places, we can identify if there are essential, perhaps even universal elements in places that parents consider supportive. Such understanding can help to choose and design places with meaning and relevance to parents. This may aid parents who have the opportunity to choose and design their own living place, it may aid professionals who choose and design living places for families in care settings such as women's shelters, homeless shelters, refugee centers, hospitals, youth care facilities, or homes that offer assisted living, and it may aid governments whose responsibility it is to decide on optimal allocation of place while place and space are under increasing pressure as a result of a decreasing amount of livable land (Boas et al., 2019; Horton et al., 2021; Milán-García et al., 2021). This dissertation may provide an upbeat to the potential recognition of physical environments as a relevant subject for future studies on family functioning and family support.

PUBLICATIONS AND PRODUCTS FOR PRACTICE

Knowledge dissemination in products for practice

We translated the results of the inductive exploration into a book for practice.

A printed book was sent to all participating shelters. An online version is open access available, and can be downloaded here:

We wrote a factsheet that features key studies on how nature can improve the quality of care for children in shelters.

A pocket-sized version was sent to all participating shelters. An online extended version is open access available, and can be downloaded here:

We made an interactive film product for professionals about the use of nature in methodical counseling of children.

The film can be viewed here:

We made a poster for the professional workplace, based on the case narrative study.

A printed poster will be handed out to all Dutch shelters at the project's closing conference in September 2022. An online version is open access available, and can be downloaded here:

We are developing a professional training course about nature interventions in family supportive shelter work.

The course description can be found here:

Knowledge dissemination in education

-Professional training course on the use of nature in professional practice at the Outdoor Living and Learning Academy of Leiden University of Applied Sciences (https://www.hsleiden.nl/olla).
-Course 'Seeing how the environment shapes children's play' for Leiden University of Applied Sciences.
-Course 'Nature-focused Social Work' for Leiden University of Applied Sciences.
-Course 'Clinical Environmental Psychology' for research Master students at Vrije Universiteit Amsterdam, department of Clinical, Neuro and Developmental Psychology VU.
-Lecture on choosing and designing outdoor play spaces at the course 'School Environment' at Leiden University of Applied Sciences.
-Lecture on monetary challenges for families at the course 'Professional Approach to Differences in the Classroom' at Leiden University of Applied Sciences.

Knowledge dissemination in lectures and presentations

-Presentation for policy advisors at Valente Branchevereniging voor Opvang, September 11th, 2017.
-Opening lecture at 'Huisje Boompje Beestje' Kick-Off Conference organized by Valente Branchevereniging voor Opvang en Stichting Kinderpostzegels on October 10th, 2017.
-Presentation at Conference of the International Association for People-Environment Studies (IAPS) in Rome (IT) on July 10th, 2018.
-Workshop at Conference 'Kind en Natuur' organized by IVN Natuureducatie on September 27th, 2018.
-Presentation for parents and professionals at *location concealed* on December 3rd, 2019.
-Presentation for professionals at Perspektiek De Terp, Den Haag, on September 17th, 2020.
-Keynote speech at 'Huisje Boompje Beestje' Closing Conference organized by Valente Branchevereniging voor Opvang en Stichting Kinderpostzegels on November 30rd, 2020.
-Mini-lecture for Leiden European City of Science 2022, May 15th 2022. Joven, M., & Peters, E. (2022). Spelen in het Singelpark. Film can be retrieved from https://leiden2022.nl/activiteiten/spelen-het-singelpark.
-Presentation at Conference of the International Association for People-Environment Studies (IAPS) in Lisbon, Portugal, June 2022.

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Appendixes

APPENDIX 1. SUMMARY

When families live in shelters, family life can be strained. Living spaces are small, rooms can be noisy, there is often turmoil, clutter, and chaos, families share facilities such as a bathroom or kitchen with other families, there are set rules and routines that the family must adhere to, and there are few places for children to play. In previous research, parents have expressed that they perceived that this limited and frustrated their family functioning (Alleyne-Green et al., 2019; Azim et al., 2019; Bradley et al., 2018; Glenn & Goodman, 2015; Glumbíková et al., 2019; Holtrop et al., 2015; Mayberry et al., 2014; Pable, 2012; Sylvestre et al., 2018; Walsh et al., 2010; Walsh et al., 2009). That is a problem, because a shelter is supposed to function as a safe base from which the family can rebuild its independent life. If the shelter actually adds stress, it cannot function as intended.

To contribute towards the reduction of this problem, the Dutch association for shelters Valente, together with Stichting Kinderpostzegels Nederland, decided to introduce nature at shelter locations, for example by creating a children's farm, a natural play area, or a vegetable garden. Various studies have already shown that nature can reduce stress in adults and that nature offers an interesting place for children to play (Dankiw et al., 2020; Fyfe-Johnson et al., 2021; Marselle, 2019; Ulrich et al., 1991). However, it is important to establish what nature can do for family functioning of families in shelter care.

To gain insight into the possible contribution of nature, we firstly explored professionals' perspective on the benefits of nature for family life in women's shelters. Four researchers and 46 care professionals collaborated for six months on this exploration by forming a Community of Practice (CoP), which was a partnership of colleagues who shared an interest in the use of nature for the support of families and interacted regularly with the intention to develop their understanding of the benefits of nature by attempting to realize these benefits in practice and constructing knowledge on that practice. A systematic structure was developed in which CoP-members' subjective perspectives were expressed, questioned, and recalibrated during CoP-meetings. Thematic analysis of transcripts of CoP meetings and case descriptions showed five themes: nature (1) offers a place for family leisure time, (2) supports social connectedness, (3) supports psychological well-being, (4) offers metaphoric experiences, and (5) supports parenting. The first four themes are in line with insights on the benefits of nature for people in general. Professionals' explanations of the fifth theme suggest that nature supports parenting by providing relatedness between parent and child, parental feelings of competence, and autonomy in parenting.

Relatedness, competence, and autonomy are described as basic psychological needs of parents (Brenning et al., 2017; Ryan & Deci, 2017). We know that all parents sometimes feel more related to their child and sometimes less so, that parents sometimes feel they can be autonomous in their parenting and sometimes not, and that parents sometimes feel competent in parenting and sometimes not. But we do not yet know what circumstances help parents find fulfillment of their parental basic psychological needs. We wanted to know if parents experienced more fulfillment of their basic psychological needs when they were in a natural environment, than when they were

in the indoor space of the shelter such as in their room. We designed a quasi-experiment and a single case experiment to test if experiencing nature was associated with the basic psychological needs of parents in shelters.

In a quasi-experimental study need satisfaction and need frustration were measured among parents in shelters (N = 160), with one measurement in the standard indoor context of the shelter and one measurement while experiencing nature. Experiencing nature was associated with enhanced need satisfaction (d = 0.28) and reduced need frustration (d = −0.24). The effect was especially pronounced for parents with young children. Our findings suggested that the physical environment matters for parents' basic psychological need fulfillment as they interact with their children in the context of sheltering. This finding opens a potential avenue for supporting parental functioning and resilience, if these effects were to be replicated across settings using controlled experimental designs. For the next study, we aimed to use a more controlled design and designed a single case experiment.

A single case experiment tested the impact of exposure to a natural environment on wellbeing of parents residing in shelters. The single case experiments with three families involved repeated and randomized exposure to the indoor environment of the shelter (baseline phases) and to a natural environment (intervention phases). During exposure, basic psychological need fulfillment in parenting as well as parents' overall affective state and satisfaction with life were assessed. Exposure to nature significantly increased basic psychological need fulfillment of parents but did not significantly improve affective state nor satisfaction with life. To contribute to parents' functioning and resilience, professionals may invite families for nature exposure for the support of parents' basic psychological need fulfillment.

Although exposure to a natural environment could only be associated with a small positive effect on parental basic psychological needs, the insight is important for practice. We know from extant literature that parents are more likely to experience well-being and interact positively with their children when their basic psychological needs are fulfilled (Brenning & Soenens, 2017; Brenning et al., 2017; Jungert et al., 2015; Mabbe et al., 2018; Slobodin et al., 2020; Van Der Kaap-Deeder et al., 2019). Therefore, it is important to find ways in which parents can achieve fulfillment. For parents and professionals that support parents it is helpful to know that something as simple as an activity in a natural environment offers parents a way to find fulfillment of their basic needs. Professionals can use that insight in their supportive work by inviting and encouraging families to do nature activities.

Nature activities are suitable for doing every day. This allows parents to experience the positive effects of nature on a daily basis, which may allow the small daily improvements to accumulate and have more important implications than the small effect size suggested. Interestingly, conducting nature activities does not have to take extra time from professionals. Professionals have shown that they can do nature activities during their regular daily work, for example by having supportive conversations or providing methodical family counseling in nature. Moreover, some families will

also be well able to engage in nature activities on their own after encouragement or guidance, which makes it a low-threshold intervention.

For shelter professionals who want to encourage their families to do nature activities, it may be helpful to learn how other professionals choose nature activities for the support of the families in their care. A case narrative study was aimed to uncover professional theories-in-use, resulting in a model that can be used as a reflective tool among shelter professionals. The model is based on an analysis of actions of professionals, captured in case narratives written by shelter professionals about parenting supportive nature activities that they facilitated for families under their care. The model shows that professionals promoted a back-and-forth between children's exploration away from the parent and being with the parent. In facilitating these interactions, professionals used nature as an environment with restorative and building capacities for parents and as an environment with supportive qualities for children's play. A dimensional framework was extracted that described how professionals may choose activities.

In addition to providing insights on the impact of nature interventions on parental basic psychological needs, and insight on the practical decisions professionals make when choosing a nature intervention for the support of parents, the studies in this dissertation also provide new lines of thinking. The studies show that the physical place where parents are, either inside the shelter or in nature, is related to their parental basic psychological needs. The physical environment where parenting takes place apparently matters. This makes it interesting to ask more often the question of where family life takes place. Could the physical environment be a possible explanatory factor for family functioning? Could the physical environment have a more prominent role in family supportive work? These now seem interesting angles for future research.

APPENDIX 3. CONTRIBUTIONS OF EACH AUTHOR, PER STUDY

Title of the study:	Making women's shelters more conducive to family life: professionals' exploration of the benefits of nature
Authors:	Elise Peters, Jolanda Maas, Carlo Schuengel, and Dieuwke Hovinga
Author contributions:	EP, JM, CS, DH: Conceptualization EP, JM, DH: Methodology EP, JM, DH: Funding acquisition EP, JM, DH: Investigation EP, JM, DH: Formal analysis EP: Writing - original draft JM, DH, CS: Writing - review and editing EP, JM, CS, DH: Final approval of the version to be published

Title of the study:	Experiencing nature to satisfy basic psychological needs in parenting: A quasi-experiment in family shelters
Authors:	Elise Peters, Jolanda Maas, Dieuwke Hovinga, Nicole Van den Bogerd, and Carlo Schuengel
Author contributions:	EP, JM, DH, CS: Conceptualization EP, JM, DH, CS: Methodology EP, JM, DH: Funding acquisition EP: Investigation EP, NvdB: Formal analysis EP: Writing - original draft JM, DH, NvdB, CS: Writing - review and editing EP, JM, DH, NvdB, CS: Final approval of the version to be published

Title of the study:	Exposure to a natural environment to improve parental wellbeing in parents in a homeless shelter: A multiple baseline single case intervention study
Authors:	Elise Peters, Dieuwke Hovinga, Jolanda Maas, and Carlo Schuengel
Author contributions:	EP, CS: Conceptualization EP, DH, JM CS: Methodology EP, DH: Funding acquisition EP: Investigation EP, CS: Formal analysis EP: Writing - original draft DH, JM, CS: Writing - review and editing EP, DH, JM, CS: Final approval of the version to be published

Title of the study:	Social workers' theories-in-use for choosing nature activities for the support of parents in shelters
Authors:	Elise Peters, Dieuwke Hovinga, Jolanda Maas, and Carlo Schuengel
Author contributions:	EP, DH, JM, CS: Conceptualization EP, DH: Funding acquisition EP: Investigation EP, JM: Formal analysis DH, JM, CS: Supervision EP: Writing - Original Draft DH, JM, CS: Writing - Review & Editing EP, DH, JM, CS: Final approval of the version to be published

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De uitvoering van het onderzoek is mogelijk gemaakt door de professionals en gezinnen die geparticipeerd hebben in het onderzoek. Professionele participanten wil ik expliciet bedanken voor hun motivatie bij de deelname aan het onderzoek, ondank de dagelijkse werkdruk en de crisis-aard van hun werksetting. Een expliciete dank gaat ook uit naar participerende gezinnen die, ondanks de stress die zij ervaarden in deze fase van hun leven, tijd wisten te maken om deel te nemen aan het onderzoek.

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APPENDIX 5. ABOUT THE AUTHOR

Curriculum Vitae
Elise Peters

Teacher and Researcher at University of Applied Sciences Leiden (2006-now)

Educational background: Educational Studies at Leiden University (2002-2007)
Registered 'Master Orthopedagoog' at SKJ (registration number 120013921)
Registered 'Basis Orthopedagoog' at NVO (registration number 8519)

In my work I look for ways to support the wellbeing and functioning of children and their parents with physical design choices.

On the one hand this is expressed in my work as an educationalist and teacher trainer. As a teacher in preschool pedagogy at the University of Applied Sciences Leiden, I work with students and teachers on designing and creating play and learning environments for young children. In recent years I worked as a project leader of a training- and workplace for teacher training students, as a developer of the course 'Seeing how the environment shapes children's play', and as a teacher on courses on preschool pedagogy of the Bachelor teacher training for primary education and the post-Bachelor training for kindergarten specialists.

On the other hand, my interest in physical environments manifests itself in my work as a researcher. In 2015, I conducted a small field study in childcare where I observed the play behavior of toddlers prior to and after changes to their outdoor playground design. These observations made me curious about the impact of physical environments on behavior of both children and the people that raise them. I spent the next few years working on the current dissertation that aimed for further unravel the impact of exposure to natural environments, now in the context of shelters.

My current work at University of Applied Sciences Leiden involves:

- Conducting a study on favorite places of children in residential family care settings.
- Co-writing a research proposal for the study of interventions to make inner city green schoolyards publicly accessible to neighborhood residents.
- Co-supervision of a study on equitable learning ecosystems for children in primary schools.
- Curriculum development for the Master Sustainable Education.
- Research funding acquisition for the department of Education.

‘There’s nothing wrong with having a tree as a friend.’ — Bob Ross